# Supplemental Data

### Includes:

Tables 4, 5

Figures 6 - 10

Search string for Embase and Pubmed

## Legend for tables and figures:

FDG-PET/CT: 18F-fluorodeoxyglucose positron emission tomography / computed tomography; DOR: diagnostic odds ratio; INTERMACS: interagency registry for mechanical circulatory support; MMB = medical microbiology; MV: metabolic volume (Cut-off:  $\geq$  9cm<sup>3</sup>) NLR: negative likelihood ratio; PLR: positive likelihood ratio.

In studies where there was insufficient data for assessment of true/false positives and negatives, these were left blank.

Table 4. Diagnostic performance of FDG PET/CT in patients with suspected infection of **LVAD pump/pocket**.

Authors	Reference standard for diagnostic performance assessment	True positive	False negative	False positive	True negative	Sensitivity	Specificity	PLR	NLR
Akin et al 2018	Clinical course review by research group including medical history, comorbidities, cultures of blood and driveline (sternal wound if suspect), laboratory tests, imaging results and outcome at end of recorded follow-up. Diagnosis according to INTERMACS definition of LVAD infection.	4	0	0	6	1.0	1.0	∞	0.00
Avramovic et al 2017	Clinical course review at the end of recorded follow-up or transplantation: clinical evidence of infection or recurrence of symptoms, swabs at driveline exit, along driveline, surgical samples if available and laboratory tests. Diagnosis according to INTERMACS definition of LVAD infection.	-	-	-	-	-	-	-	-
Bernhardt et al 2017	ISHLT criteria at end of follow-up, based on clinical symptoms, cultures and swabs of exit site, along driveline and during surgery if available, and imaging data. In case of missing data, consensus diagnosis made during multidisciplinary meeting.	4	1	0	13	0.800	1.0	<b>∞</b>	0.20
Dell' Aquila et al 2016	Findings of MMB (cultures of skin and/or tissue surrounding driveline or central device components if available), surgery, clinical evidence of infection and recurrence of symptoms at end of recorded follow up, diagnosis according to INTERMACS definition of LVAD infection	-	-	-	-	-	-	-	-
Dell' Aquila et al 2018	Clinical evidence of infection, cultures of skin and/or tissue surrounding driveline or central device components if available), surgery and recurrence of symptoms at end of recorded follow up. diagnosis according to INTERMACS definition of LVAD infection.	13	3	6	39	0.813	0.867	6.09	0.22
De Vaugelade et al 2019	ISHLT criteria at end of follow-up, based on clinical symptoms, microbiology and imaging data. In case of missing data, consensus diagnosis made during multidisciplinary meeting	5	0	3	16	1.0	0.842	6.30	0.00
Kanapinn et al 2019	Consensus by 2 physicians with access to clinical criteria, findings of MMB (not further defined) and all diagnostic imaging (incl. FDG-PET/CT)	-	-	-	-	-	-	-	-
Kim et al 2019	Findings of MMB, surgery, clinical evidence of infection and recurrence of symptoms; it was not reported who performed the reference test.	23	0	0	12	1.0	1.0	∞	0.00
Tam et al 2019	Clinician determined presence or absence of LVAD infection based on history, laboratory tests, imaging studies and clinical outcome. Confirmation at 30 day follow up.	10	0	5	4	1.0	0.444	1.80	0.00
Sommerlath Sohns et al, 2019	No reference test for extent of driveline / LVAD infection defined	-	-	-	-	-	-	-	-

Table 5. Diagnostic performance of FDG PET/CT in patients with suspected  $\underline{\textit{driveline}}$  infection.

Authors	Reference standard for diagnostic performance assessment	True positive	False negative	False positive	True negative	Sensitivity	Specificity	PLR	NLR
Akin et al 2018	Clinical course review by research group including medical history, comorbidities, cultures of blood and driveline (sternal wound if suspect), laboratory tests, imaging results and outcome at end of recorded follow-up. Diagnosis according to INTERMACS definition of LVAD infection.	7	0	0	3	1.0	1.0	∞	0.00
Avramovic et al 2017	Clinical course review at the end of recorded follow-up or transplantation: clinical evidence of infection or recurrence of symptoms, swabs at driveline exit, along driveline, surgical samples if available and laboratory tests. Diagnosis according to INTERMACS definition of LVAD infection.	Visual 21 MV 23	3 1	5 3	19 21	0.875 0.958	0.792 0.875	4.20 7.67	0.16 0.05
Bernhardt et al 2017	ISHLT criteria at end of follow-up, based on clinical symptoms, cultures and swabs of exit site, along driveline and during surgery if available, and imaging data. In case of missing data, consensus diagnosis made during multidisciplinary meeting.	10	1	0	18	0.910	1.0	∞	0.09
Dell' Aquila et al 2016	Findings of MMB (cultures of skin and/or tissue surrounding driveline or central device components if available), surgery, clinical evidence of infection and recurrence of symptoms at end of recorded follow up, diagnosis according to INTERMACS definition of LVAD infection	-	-	-	-	-	-	-	-
Dell' Aquila et al 2018	Clinical evidence of infection, cultures of skin and/or tissue surrounding driveline or central device components if available), surgery and recurrence of symptoms at end of recorded follow up. diagnosis according to INTERMACS definition of LVAD infection.	35	1	0	25	0.972	1.0	∞	0.03
De Vaugelade et al 2019	ISHLT criteria at end of follow-up, based on clinical symptoms, microbiology and imaging data. In case of missing data, consensus diagnosis made during multidisciplinary meeting	11	0	9	4	1.0	0.378	1.44	0.00
Kanapinn et al 2019	Consensus by 2 physicians with access to clinical criteria, findings of MMB (not further defined) and all diagnostic imaging (incl. FDG-PET/CT)	23	0	0	7	1.0	1.0	∞	0.00
Kim et al 2019	Findings of MMB, surgery, clinical evidence of infection and recurrence of symptoms; it was not reported who performed the reference test.	19	0	0	16	1.0	1.0	∞	∞
Tam et al 2019	Clinician determined presence or absence of LVAD infection based on history, laboratory tests, imaging studies and clinical outcome. Confirmation at 30 day follow up.	11	0	6	2	1.0	0.250	1.33	0.00
Sommerlath Sohns et al, 2019	No reference test for extent of driveline / LVAD infection defined	-	-	-	-	_	_	-	-

Figure 6. NLR and PLR Forest plots for FDG PET/CT for infection of <u>LVAD pump/pocket</u>

#### Negative Likelihood Ratio Overall NLR: 0.122 **Studies** Estimate (95% C.I.) (FN \* Di-)/(TN \* Di+) Akin 2018 0.108 (0.007, 1.582) 0/24 Bernhardt 2017 0.255 (0.016, 4.123) 24/120 Dell Aquila 2018 0.216 (0.099, 0.473) 135/624 De Vaugelade 2019 0.101 (0.038, 0.270) 0/80 Kim 2019 0.022 (0.001, 0.328) 0/276 0.101 (0.057, 0.180) Tam 2019 0/40 Overall (I^2=0 %, P=0.486) 0.122 (0.082, 0.183) 159/1164 0.03 0.07 0.12 0.29 0.01 0.01 0.71 1.43 2.86 4.12 Negative Likelihood Ratio (log scale)

#### Positive Likelihood Ratio Overall PLR: 5.557 **Studies** Estimate (95% C.I.) (TP \* Di-)/(FP \* Di+) Akin 2018 12.600 (0.858, 185.047) 24/0 Bernhardt 2017 37.500 (2.320, 606.016) 96/0 Dell Aquila 2018 6.094 (2.790, 13.309) 585/96 De Vaugelade 2019 5.238 (1.963, 13.980) 95/15 Kim 2019 25.458 (1.679, 385.928) 276/0 Tam 2019 1.736 (0.976, 3.085) 90/50 1166/161 Overall (I^2=64.3 %, P=0.016) 5.557 (2.352, 13.130) 0.86 1.72 8.58 17.16 42.9 85.79 171.59 428.97 4.295.56 Positive Likelihood Ratio (log scale)

Figure 7. NLR and PLR Forest plots for FDG PET/CT for driveline infection

#### Overall NLR: 0.133 Negative Likelihood Ratio Studies Estimate (95% C.I.) (FN \* Di-)/(TN \* Di+) Akin 2018 0.071 (0.005, 0.961) 0/21 Avramovic 2017 0.158 (0.071, 0.349)72/456 Bernhardt 2017 0.128 (0.008, 1.995) 18/198 Dell Aquila 2018 0.041 (0.003, 0.644) 25/900 De Vaugelade 2019 0.130 (0.089, 0.189) 0/44 Kanapinn 2019 0.022 (0.002, 0.326) 0/161 Kim 2019 0.026 (0.002, 0.396) 0/304 Tam 2019 0.150 (0.098, 0.229) 0/22 Overall (I^2=0 %, P=0.718) 0.133 (0.103, 0.173) 115/2106 0.01 0.02 0.03 0.08 0.13 0.3 0.76 1.52 2

#### Positive Likelihood Ratio Overall PLR: 3.934 Studies Estimate (95% C.I.) (TP \* Di-)/(FP \* Di+) Akin 2018 7.500 (0.558, 100.873) 21/0 Avramovic 2017 4.200 (1.898, 9.295) 504/120 Bernhardt 2017 33.250 (2.140, 516.717) 180/0 Dell Aquila 2018 49.892 (3.203, 777.189) 875/0 De Vaugelade 2019 1.412 (0.966, 2.064) 143/99 Kanapinn 2019 15.667 (1.069, 229.513) 161/0 Kim 2019 33.150 (2.158, 509.121) 304/0 Tam 2019 1.327 (0.870, 2.024)88/66 Overall (I^2=72.98 %, P< 0.001) 3.934 (1.875, 8.255) 2276/285 0.56 1.12 2.79 3.93 5.58 11.15 27.88 55.76 111.53 278.82 557.63 Positive Likelihood Ratio (log scale)

Negative Likelihood Ratio (log scale)

Figure 8. Forest plot Diagnostic Odds Ratio <sup>18</sup>F-FDG PET/CT for <u>LVAD pump/pocket and driveline</u> infection

			Overall DOR: 38.433
Studies	Estimate (95% (	C.I.) (TP * TN)/(FP *	FN)
Akin et al 2018	85.000 (1.319, 5	478.065) 16/0	
Avramovic et al 2017	26.600 (5.589,	126.596) 399/15	<del></del>
Bernhardt et al 2017	156.600 (6.877, 3	566.114) 182/0	
Dell'Aquila et al - 2 2018	22.500 (5.542,	91.353) 540/24	<b>———</b>
De Vaugelade et al 2019	40.000 (1.749,	914.787) 40/1	<del></del>
Kanapinn et al 2019	705.000 (12.846, 38	691.742) 161/0	
Kim et al 2019	855.000 (15.635, 46	756.257) 196/0	
Tam et al 2019	8.846 (0.366,	213.798) 22/0	<del>-  </del>
Overall (I^2=0 % , P=0.445)	38.433 (16.535,	89.335) 1556/40	
			0.37 0.73 1.83 3.66 7.32 18.3 36.6 73.2 183.01 732.04 1830.1 7320.4118301.03  Diagnostic Odds Ratio (log scale)

Figure 9. Forest plot Diagnostic Odds Ratio <sup>18</sup>F-FDG PET/CT for <u>driveline</u> infection

				Overall DOR: 92.457
Studies	Estimate (	95% C.I.)	(TP * TN) / (FP * FN)	1)
Akin 2018	105.000 (1.705	, 6464.654)	21/0	
Avramovic 2017	26.600 (5.589	, 126.596)	399/15	
Bernhardt 2017	259.000 (9.659	, 6945.214)	180/0	
Dell Aquila 2018	1207.000 (47.233	, 30843.682)	875/0	
De Vaugelade 2019	10.895 (0.518	, 229.010)	44/0	
Kanapinn 2019	705.000 (12.846	, 38691.742)	161/0	
Kim 2019	1287.000 (24.184	, 68490.014)	304/0	
Tam 2019	8.846 (0.366	, 213.798)	22/0	
Overall (I^2=38.96 % , P=0.119)	92.457 (22.711	, 376.395)	2006/15	
				0.37 0.73 1.83 3.66 7.32 18.3 36.6 73.2 183.01 732.04 1830.1 7320.41 36602.05  Diagnostic Odds Ratio (log scale)

Figure 10 . Forest plot Diagnostic Odds Ratio  $^{18}\text{F-FDG}$  PET/CT for infection of  $\underline{\text{LVAD pump/pocket}}$ 

			Overall DOR: 49.434
Studies	Estimate (95% C.	.I.) (TP * TN)/(FP * FN)	)
Akin 2018	117.000 (1.939, 706	60.232) 24/0	
Bernhardt 2017	•	09.848) 96/0	
Dell Aquila 2018	28.167 (6.152, 12	28.968) 507/18	<del></del>
De Vaugelade 2019	51.857 (2.298, 117	70.117) 80/0	<u> </u>
Kim 2019	1175.000 (21.966, 6285	52.646) 276/0	<del> </del>
Tam 2019	17.182 (0.775, 38	80.840) 40/0	<del> </del>
Overall (I^2=0 % , P=0.552)	49.434 (16.716, 14	46.187) 1023/18	
			0.78 1.55 3.88 7.75 15.5 38.76 77.52 155.03 387.58775.17 3875.84 15503.35 62852.65 Diagnostic Odds Ratio (log scale)

# Search Strings:

Embase: ('left ventricular assist device'/exp OR 'lvad' OR 'left ventricular assist device' OR 'ventricular assist device'/exp OR 'infection'/exp O

Pubmed: (Left ventricular assist device[tiab] OR LVAD[tiab] OR Ventricular Assist Device[tiab] OR VAD[tiab] OR Driveline infection[tiab]) And (infection[tiab] OR endocarditis[tiab] or Endocarditis[mesh]) AND (Positron emission tomography[tiab] OR PET) NOT (case report[tiab])