

Supplementary Material

**Table S1. ICD-10 Admission & Principal Diagnosis Codes Included in Each Etiology Group.** ICD, international classification of disease; AMI, acute myocardial infarction; AHF, acute heart failure; ARDS, acute respiratory distress syndrome.

Etiology	ICD-10 Diagnosis Codes	
<b>AMI</b>	I20.0, I20.9, I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I21.9, I21.A1, I21.A9, I22.2, I24.9, I25.10, I25.110, I25.118, I25.119, I25.5, I25.9, I20.8, I22.0, I22.8, I24.8, I25.810, I23.0, I23.2, I23.3, I23.8, I24.0, I25.42, R93.1, T82.855A, T82.857A, T82.867A, Z82.49, Z98.61, R07.89, R07.9	
<b>AHF</b>	<b>Heart Failure</b>	I50.9, I09.81, I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.33, I50.40, I50.41, I50.43, I50.810, I50.811, I50.813, I50.814, I50.82, I97.130, I97.131, J81.0, J81.1, I50.84, I31.9, I40.0, I40.9, I42.0, I42.2, I42.8, I42.9, I51.4, I51.7, I51.81, I09.03, I09.42, Z94.1, Z95.811, B57.2, I40.8, I42.6, I42.7, I09.43
	<b>Arrhythmia</b>	I47.1, I47.2, I48.0, I48.1, I48.19, I48.20, I48.3, I48.91, I48.92, I49.01, I49.3, I49.5, I49.8, I49.9, R00.0, R00.1, R00.2, I48.21, I44.1, I45.5, I45.9, R94.31, I44.2, I44.30
	<b>Valvular Disorders</b>	I05.0, I05.1, I05.9, I06.0, I07.1, I08.0, I08.1, I08.3, I34.0, I34.1, I34.8, I34.9, I35.0, I35.1, I35.2, I35.9, Q23.0, Q23.1, I05.2, I33.0, I33.9, I34.2, I35.8, I36.1, I37.1, I38 T82.03XA, T82.09XA, T82.228A, T82.6XXA, T82.01XA, T82.221A, T82.310A
<b>Other</b>	<b>Sepsis/ Infection</b>	A09, A32.7, A40.0, A40.1, A40.3, A40.8, A40.9, A41.01, A41.02, A41.1, A41.3, A41.4, A41.50, A41.51, A41.52, A41.53, A41.59, A41.81, A41.89, A41.9, A48.1, A49.9, B02.7, B19.20, B34.9, J06.9, J12.1, J12.9, J15.8, J15.9, J18.1, J18.9, J20.9, J85.1, O98.52, R65.21, T80.211A, T80.212A, T81.42XA, T81.44XA, U07.1, B20, B33.8, B37.7, J10.01, J10.08, J10.1, J12.89, J15.211, J15.6, J20.8, T80.218A, T80.29XA, T81.41XA, T81.43XA, T81.4XXA, T83.511A, T83.512A, T83.518A, T83.592A
	<b>Surgical</b>	I71.00, I71.01, I71.02, I71.03, I71.1, I71.2, I71.3, I71.4, I71.6, I71.8, I71.9, I74.09, I74.11, I77.810, I97.190, I97.51, I97.621, I97.790, I97.88, I97.89, Q25.43, Q25.49, T82.330A
	<b>Pulmonary Embolism</b>	I23.6, I26.02, I26.09, I26.90, I26.92, I26.93, I26.94, I26.99, I27.82, I82.220, I82.403, I82.409, I82.432, I82.441, I82.4Z2, I82.622, I87.8
	<b>Cardiac Arrest</b>	I46.8, I46.9, I97.120, I97.121, I97.711
	<b>ARDS</b>	J80, J96.00, J96.01, J96.02, J96.20, J96.21, J96.22, J96.90, J96.91, J96.92, J98.9, R06.03, R09.2
	<b>Kidney Disease</b>	I12.0, I12.9, I13.10, N17.0, N17.8, N17.9, N18.3, N18.6, N18.9, N19
	<b>Other Cardiac Diagnosis</b>	D15.1, I25.3, I27.9, I30.8, I30.9, I31.1, I31.2, I31.3, I31.4, I51.1, I51.3, I51.89, I51.9, I73.9, I74.3, I74.2, I74.5, I74.9, I77.9, I99.8, M32.12, O9A.12, Q21.0, Q21.1, Q21.3, Q23.4, R09.89, R94.30, R94.39, T82.110A, T82.118A, T82.120A, T82.190A, T82.198A, T82.41XA, T82.42XA, T82.518A, T82.524A, T82.594A, T82.598A, T82.818A, T82.838A, T82.897A, T82.898A, T82.9XXA, Z45.010, Z45.02, Z95.810
	<b>Other Non-Cardiac Diagnosis</b>	000.00, A04.72, A15.0, A24.9, A26.7, A48.0, B01.11, B19.9, B37.81, B96.5, C13.9, C15.4, C15.9, C16.8, C17.0, C18.0, C18.4, C18.6, C18.7, C18.9, C19, C21.8, C25.0, C25.2, C34.02, C34.11, C34.12, C34.90, C34.91, C34.92, C38.0, C40.21, C48.0, C49.3, C54.1, C55, C61, C64.1, C67.9, C70.1, C71.9, C77.1, C78.00, C78.01, C78.6, C78.7, C79.31, C79.51, C7A.1, C80.1, C82.90, C83.30, C83.32, C83.39, C84.48, C85.10, C85.11, C85.18, C85.89, C85.90, C85.91, C85.95, C86.5, C90.00, C91.00, C91.10, C91.50, C91.51, C91.92, C92.00, C92.Z0, C95.90, D32.0, D35.01, D35.1, D35.2, D3A.090, D3A.8, D46.9, D50.0, D57.00, D57.01, D59.1, D59.13, D61.810, D61.818, D62, D64.9, D65, D68.32, D68.9, D69.3, D69.6, D70.9, D72.829, D86.0, D86.89, E03.5, E05.01, E10.10, E11.00, E11.10, E11.22, E11.43, E11.51, E11.52, E11.621, E11.649, E11.65, E11.69, E15, E16.2, E22.2, E32.8, E66.01, E72.20, E80.6, E83.42, E83.51, E83.52, E83.59, E85.2, E85.4, E85.81, E85.82, E86.0, E86.9, E87.0, E87.1, E87.2, E87.5, E87.70, E87.79, E87.8, E88.09, E88.3, F10.10, F10.120, F10.221, F10.231, F10.239, G00.8, G04.81, G06.2, G40.101, G40.401, G40.89, G40.901, G40.909, G45.1, G45.9, G58.8, G70.01, G89.11, G92, G93.1, G93.40, G93.41, G93.49, G93.6, G93.89, G95.29, H50.07, H53.9, I10, I16.0, I16.1, I27.0, I27.20, I27.21, I27.24, I27.29, I28.8, I60.00, I60.11, I60.2, I60.31, I60.4, I60.7, I60.8, I60.9, I61.1, I61.5, I61.8, I61.9, I62.00, I62.01, I62.9, I63.12, I63.211, I63.212, I63.231, I63.233, I63.311, I63.40, I63.411, I63.433, I63.50, I63.511, I63.512, I63.519, I63.521, I63.59, I63.89, I63.9, I65.1, I65.22, I65.29, I67.1, I67.89, I69.398, I70.201, I70.203, I70.211, I70.222, I70.232, I70.234, I70.261, I70.421, I72.4, I72.9, I77.71, I77.74, I81, I85.01, I96, J36, J39.8, J43.9, J44.0, J44.1, J45.51, J45.901, J45.902, J68.1, J69.0, J69.8, J70.2, J84.10, J84.112, J85.2, J86.0, J86.9, J90, J91.8, J93.0, J93.9, J94.2, J95.03, J95.811, J95.830, J95.89, J98.4, J98.51, J98.59, J98.8, K11.20, K11.21, K20.91, K22.3, K25.1, K25.4, K25.5, K25.6, K26.0, K26.4, K26.5, K26.6, K29.01, K31.1, K31.811, K31.82, K35.80, K40.30, K41.40, K42.0, K43.0, K43.1, K43.2, K43.3, K43.5, K43.6, K43.9, K45.0, K45.8, K46.0, K52.9, K55.019, K55.039, K55.059, K55.1, K55.21, K55.8, K55.9, K56.1, K56.2, K56.41, K56.5, K56.50, K56.60, K56.601, K56.609, K56.69, K56.691, K56.7, K57.20, K57.31, K57.33, K57.40, K57.91, K57.92, K58.0, K59.00, K62.5, K62.89, K63.1, K65.1, K65.9, K66.1, K66.8, K70.30, K70.31, K70.40, K70.9, K71.10, K71.11, K72.00, K72.01, K72.90, K74.60, K74.69, K75.0, K76.1, K76.7, K80.00, K80.20, K80.30, K80.31, K80.50, K80.71, K81.0, K81.9, K82.8, K83.09, K83.3, K85.10, K85.12, K85.20, K85.21, K85.90, K86.1, K91.840, K92.0, K92.1, K92.2, K92.9, K95.89, L02.214, L02.511, L02.91, L03.115, L03.116, L03.119, L03.90, L08.9, L29.9, L76.22, L76.34, L89.150, L89.159, L97.101, L97.509, L97.519, L98.492, M00.011, M10.9, M17.11, M17.12, M25.511, M25.519, M25.551, M25.561, M31.1, M33.12, M35.81, M35.9, M40.205, M40.209, M43.9, M46.27, M48.06, M48.061, M48.062, M48.56XA, M50.20, M51.16, M54.16, M54.2, M54.9, M62.82, M66.862, M71.551, M72.6, M79.602, M79.604, M79.605, M79.606, M79.609, M79.662, M79.671, M79.89, M80.052A, M80.88XA, M84.40XA, M84.551A, M84.552A, M84.562A, M84.58XA, M86.10, M86.171, M86.642, M89.18, M97.11XA, N05.8, N10, N12, N13.6, N14.1, N20.0, N25.9, N28.9, N30.01, N30.90, N32.1, N32.89, N36.5, N39.0, N39.3, N48.89, N49.3, N76.89, N81.3, N82.3, N82.4, N92.0, N93.9, N95.0, O75.3, O9A.212, P76.9, Q27.33, Q43.0, R04.0, R04.2, R04.89, R05, R06.2, R06.89, R09.02, R10.11, R10.13, R10.31, R10.84, R10.9, R11.0, R11.10, R11.15, R11.2, R13.10, R13.13, R14.0, R17, R18.8, R19.00, R19.01, R19.7, R22.2, R22.43, R23.0, R25.1, R26.2, R26.81, R26.89, R26.9, R29.6, R29.810, R29.898, R29.90, R31.0, R31.9, R40.1, R40.20, R40.4, R41.0, R41.82, R41.89, R42, R47.01, R47.1, R47.81, R50.9, R51, R52, R53.1, R53.81, R53.83, R55, R56.1, R56.9, R57.1, R57.8, R57.9, R58, R59.1, R60.0, R60.1, R60.9, R62.7, R63.0, R63.8, R68.0, R68.89, R73.9, R74.0, R74.01, R74.8, R77.8, R78.81, R79.1, R79.89, R91.1, R91.8, R94.8, S00.83XA, S01.81XA, S02.2XXA, S02.80XA, S06.339A, S06.4X0A, S06.5X0A, S06.5X9A, S06.6X0A, S06.6X9A, S09.90XA, S12.111A, S12.120A, S15.121A, S21.431A, S22.009A, S22.069A, S22.081A, S22.20XA, S22.31XA, S22.39XA, S22.41XA, S22.42XA, S22.43XA, S22.49XA, S27.1XXA, S32.19XA, S32.511A, S32.591A, S32.599A, S32.810A, S36.031A, S36.032A, S36.899A, S39.91XA, S42.201K, S46.221A, S70.11XA, S72.001A, S72.002A, S72.009A, S72.012A, S72.021A, S72.041A, S72.091A, S72.092A, S72.111A, S72.141A, S72.142A, S72.145A, S72.21XA, S72.341A, S72.401A, S72.452A, S72.491A, S72.492A, S72.91XA, S73.005A, S76.112A, S80.11XA, S82.109C, S82.142C, S82.252A, S82.842C, S82.892B, T07, T14.8, T14.8XXA, T14.90, T14.90XA, T14.91XA, T17.820A, T17.890A, T17.908A, T17.920A, T17.928A, T22.391A, T24.311A, T30.0, T40.1X1A, T40.1X4A, T40.2X1A, T40.3X2A, T40.5X1A, T42.1X1A, T42.4X1A, T42.4X2A, T42.4X4A, T43.212A, T43.591A, T43.594A, T43.621A, T44.7X1A, T44.7X2A, T44.8X1A, T44.901A, T45.0X2A, T45.511A, T46.0X1A, T46.1X1A, T46.1X1S, T46.1X2A, T46.5X1A, T46.5X2A, T50.4X2A, T50.4X4A, T50.901A, T50.902A, T50.991A, T53.6X4A, T56.891A, T67.5XXA, T68.3XXA, T71.162A, T71.164A, T78.2XXA, T78.3XXA, T79.4XXA, T79.6XXA, T79.A0XA, T79.A21A, T79.A22D, T81.30XA, T81.31XA, T81.32XA, T81.595A, T81.718A, T81.719A, T81.83XA, T81.89XA, T81.9XXA, T84.125A, T85.611A, T85.868A, T86.19, T86.5, T87.43, T87.44, T87.54, T87.89, T88.6XXA, V87.7XXA, Z04.3, Z20.828, Z34.80, Z41.8, Z45.2, Z47.33, Z51.11, Z51.5, Z51.89, Z68.42, Z82.3, Z86.711, Z90.10, Z92.81

**Table S2. ICD-10 Procedure Codes.** LHC, left heart catheterization; RHC, right heart catheterization; SWAN, swan-ganz catheterization; PCI, percutaneous coronary intervention; CABG, coronary artery bypass graft; VA ECMO, Veno-arterial extracorporeal membrane oxygenation; MCS, percutaneous temporary mechanical circulatory support; IABP, intra-aortic balloon pump; pVAD, percutaneous ventricular assist device, LVAD, left ventricular assist device

Procedure	ICD-10 Procedure Codes	
LHC	4A023N7, 4A023N8, B2111ZZ, B211YZZ, B2161ZZ, B216YZZ, B2151ZZ, B215YZZ, B2181ZZ, B218YZZ, B2131ZZ, B213YZZ, B21F1ZZ, B2121ZZ, B2101ZZ, B210110	
RHC/SWAN	4A023N6, 4A023N8, B2141ZZ, B31S1ZZ, B31U1ZZ, B214YZZ, B2161ZZ, B216YZZ, B2171ZZ, 5A12012, B31TYZZ, 02HR32Z, 02HQ33Z, 02HR33Z, 02HP32Z, 02HQ02Z, 02HQ32Z, 4A133B3, 5A1221Z	
PCI	027337Z, 027037Z, 027036Z, 02703FZ, 027035Z, 02703EZ, 0270346, 0270356, 027034Z, 0270456, 02703DZ, 02703Z6, 02703ZZ, 027237Z, 027236Z, 0272356, 0272346, 027234Z, 02723ZZ, 027137Z, 027136Z, 027135Z, 02713EZ, 0271376, 0271366, 0271356, 027134Z, 02713DZ, 02714E6, 02713ZZ, 02C03ZZ, X2C2361, 02C13Z6, X2C1361, 02C13ZZ, 0271346, 0273346, 0270366, 027046Z, 02C00ZZ	
CABG	021309W, 02130Z9, 0210093, 0210099, 02100AW, 02100KW, 02100JW, 02100J3, 02100Z3, 02100A9, 02100Z9, 02100Z8, 02100AC, 02100ZC, 0212093, 0212099, 021209W, 0211093, 0211099, 02110AW, 021109W, 021009W, 02110KW, 02110JW, 02100K8, 02110Z9, 02110Z8, 02110AC, 0213099, 02100A8, 021009C, 02120Z9, 02110A8, 02110Z3	
Valve Procedure	025G3ZZ, 027F3ZZ, 02BF0ZZ, 02BG0ZX, 02BG0ZZ, 02BJ0ZZ, 02CF0ZZ, 02CG0ZZ, 02CJ0ZZ, 02QF0ZZ, 02QG0ZZ, 02QJ0ZZ, 02RF07Z, 02RF08Z, 02RF0KZ, 02RF38Z, 02RF3JZ, 02RG08Z, 02RG0JZ, 02RG0KZ, 02RH0KZ, 02RJ08Z, 02UF08Z, 02UF0JZ, 02UF0KZ, 02UG07Z, 02UG08Z, 02UG0JZ, 02UG3JZ, 02UJ0JZ, 0DBC8ZX, X2RF032, 02RG3JH, 02RH08Z, 02RJ38Z, 02UJ3JZ, 02UJ4JZ, 02VG0ZZ, 02WG0JZ	
MCS	IABP	5A02210, 5A02110
	pVAD	5A0221D, 02HA3RZ, 02HA4RZ, 02HA3RJ, 02HA0RZ, 5A0211D, 02HA3RS
	VA ECMO	5A15223, 5A1522G, 5A1522F, 5A02216
	Protek Duo	02HA3QZ
	LVAD	02HA0QZ
Heart Transplant	02YA0Z0	

**Table S3. Overview of Centers Included in the Northwell Shock Registry (n=11).** AHF, advanced heart failure; CTS, cardiothoracic surgery; CCU, cardiac intensive care unit; ECMO, extracorporeal membrane oxygenation; HT, heart transplantation; MCS, percutaneous temporary mechanical circulatory support; VAD, durable ventricular assist device

Site Code	Shock Level	Bed Capacity	MCS	CTS/ECMO	Cath Lab	VAD/HT	AHF Service	Dedicated CCU
A	1	756	yes	yes	yes	yes	yes	yes
B	1a	632	yes	yes	yes	no	yes	yes
C	1a	313	yes	yes	yes	no	no	no
D	1a	807	yes	yes	yes	no	yes	yes
E	1a	491	yes	yes	yes	no	yes	yes
F	2	348	yes	no	yes	no	no	yes
G	3	216	no	no	no	no	no	no
H	3	204	no	no	no	no	no	no
I	3	312	no	no	no	no	no	no
J	3	284	no	no	no	no	no	no
K	3	103	no	no	no	no	no	no

