

Supplemental materials.

Supplemental methods. T1 mapping used a Siemens research works-in-progress sequence (WIP1041B) that acquired images using a modified look-locker inversion recovery (MOLLI) protocol using a 5s(3s)3s sampling scheme: 2 inversions, with images acquired each heartbeat for 5 sec following the 1st inversion, 3 sec recovery, and images acquired for 3 sec following a 2nd inversion. T2 mapping used the Siemens MyoMap sequence which acquired 3 T2 weighted measurements and performed an exponential fit for each pixel after respiratory motion correction. The imaging used a T2-prepared single shot b-SSFP readout with T2 preparation times (TE) = 0.25, and 55ms with a recovery period of 3 heartbeats between measurements.

Supplemental table 1. Baseline characteristics of the overall population divided into Training sample and Validation sample.

	Training sample (n = 694)	Validation sample (n = 174)	p value Training sample vs Validation sample
General parameters			
Age, years	69 ± 13	70 ± 13	0.962
Male, %	65	71	0.153
BMI, kg/m ²	26 ± 9	26 ± 9	0.341
SBP, mmHg	121 ± 37	122 ± 40	0.715
DBP, mmHg	74 ± 21	73 ± 23	0.259
Hemoglobin, gr/dl	13.3 ± 1.9	13.0 ± 1.8	0.054
Hematocrit, %	39.8 ± 5.3	39.3 ± 5.3	0.301
eGFR, ml/min/1.73m ²	72 ± 24	67 ± 22	0.312
Albumin, g/L	41 ± 8	41 ± 7	0.527
Proteinuria, g/24h	0.21 (0.13-1.49)	0.23 (0.14-0.69)	0.493
NYHA Class, %	I = 41.2 % II = 50.7 % III = 7.9 % IV = 0.2 %	I = 40.9 % II = 47.4 % III = 11.7 % IV = 0 %	0.628
6-minute walking test, mt	379 ± 141	387 ± 145	0.564
Heart rate, bpm	73 ± 14	71 ± 15	0.689
Biomarkers			
NT-proBNP, ng/l	1141 (212-3406)	1642 (220-4115)	0.232
Echocardiographic parameters			
LA area, cm ²	23 ± 7	23 ± 8	0.274
Lateral E', cm/s	0.08 ± 0.04	0.08 ± 0.04	0.324
E/E'	12 ± 8	13 ± 7	0.742
E-wave deceleration time, ms	210 ± 66	211 ± 57	0.955
CMR parameters			
LV mass, g	178 ± 81	186 ± 77	0.321
LV mass index, g/m ²	93 ± 40	98 ± 38	0.234
LVEDV, ml	128 ± 41	128 ± 38	0.976

LVEDV index, ml/m ²	67 ± 18	67 ± 18	0.789
LVESV, ml	49 ± 31	48 ± 28	0.726
LVESV index, ml/m ²	26 ± 15	26 ± 15	0.965
LVSV, ml	79 ± 24	80 ± 26	0.626
LVSV index, ml/m ²	41 ± 11	42 ± 12	0.697
LVEF, %	63 ± 13	63 ± 14	0.974
Native T1, ms	1095 ± 79	1096 ± 82	0.836
T2, ms	49 ± 3	50 ± 4	0.412
ECV, %	41 ± 13	42 ± 13	0.572

Values are mean ± SD, %, or median (interquartile range).

BMI = Body Mass Index; SPB = systolic blood pressure; DBP = diastolic blood pressure; eGFR = estimated Glomerular Filtration Rate; NYHA = New York Heart Association; NT-proBNP = N-terminal pro-B-type natriuretic peptide; LA = left atrium; CMR = cardiac magnetic resonance; LV = left ventricular; LVEDV = left ventricular end-diastolic volume; LVESV = left ventricular end systolic volume; LVSV = left ventricular stroke volume; LVEF = left ventricular ejection fraction; ECV = extracellular volume.

Supplemental table 2. Relevant parameters for each of the three cut-offs of native T1 for the diagnosis of cardiac amyloid as well as model accuracy, discrimination and calibration from both the training and validation samples.

	Training sample	Validation sample
Sample size	694	174
Number with disease (observed)	351 (50.6%)	90 (51.7%)
Predicted probability (range)	(0, 1)	(0, 1)
Mean Brier score	0.10	0.11
Spiegelhalter p-value for Brier score	0.83	0.66
AUC	0.93	0.92
Hosmer-Lemeshow p-value	0.25	0.26
OR (95%CI)[p-value]	1.04 (1.03, 1.04) [< 0.001]	1.03 (1.02,1.04) [< 0.001]
Optimal T1 cut-off, 1091ms (z-score 1.7)		
Total model accuracy	87%	85%
Sensitivity	85%	88%
Specificity	87%	82%
PPV	87%	84%
NPV	85%	86%
High Negative Predictive Value T1 cut-off, 1036ms (z-score 0.4)		
Total model accuracy	73%	76%
Sensitivity	99%	98%
Specificity	46%	52%
PPV	65%	69%
NPV	98%	96%
High Positive Predictive Value T1 cut-off, 1164ms (z-score 3.5)		
Total model accuracy	67%	66%
Sensitivity	32%	39%
Specificity	99%	98%
PPV	98%	95%
NPV	60%	60%

Supplemental table 3. Diagnostic performance of relevant laboratory, echocardiographic and CMR parameters in patients with or without anaemia.

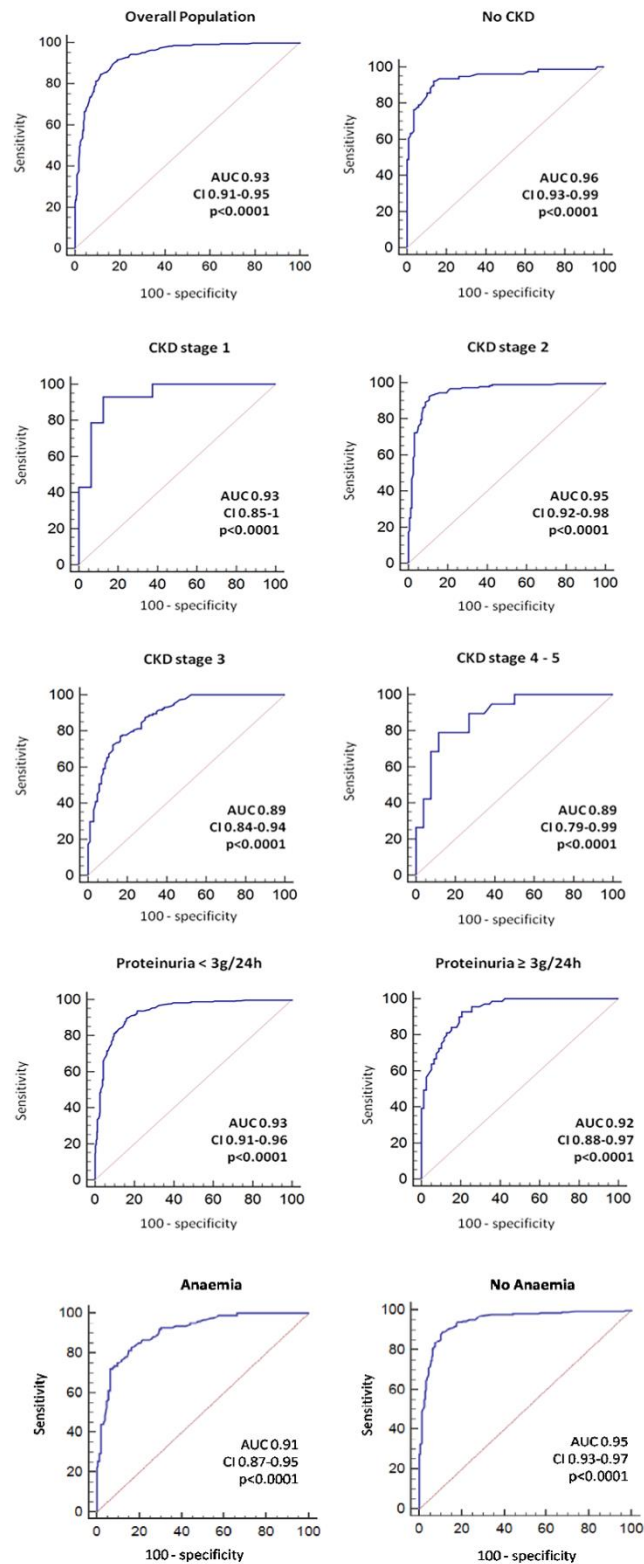
	Anaemia (n = 307)	No Anaemia (n = 561)	p value Anaemia vs No Anaemia
	AUC (95% CI)	AUC (95% CI)	
Biomarkers			
NT-proBNP, ng/l	0.84 (0.78-0.90)	0.92 (0.89-0.95)	0.0003
Echocardiographic parameters			
LA area, cm ²	0.69 (0.61-0.76)	0.78 (0.74-0.83)	0.031
Lateral E', cm/s	0.72 (0.64-0.79)	0.78 (0.73-0.83)	0.37
E/E'	0.78 (0.71-0.84)	0.87 (0.83-0.90)	0.036
E-wave deceleration time, ms	0.64 (0.57-0.71)	0.60 (0.55-0.65)	0.39
CMR parameters			
LV mass, g	0.78 (0.72-0.85)	0.84 (0.79-0.88)	0.23
LV mass index, g/m ²	0.82 (0.76-0.88)	0.87 (0.83-0.91)	0.17
LVEDV, ml	0.62 (0.54-0.69)	0.56 (0.50-0.62)	0.35
LVEDV index, ml/m ²	0.62 (0.54-0.70)	0.56 (0.50-0.62)	0.35
LVESV, ml	0.51 (0.43-0.60)	0.61 (0.56-0.67)	0.11
LVESV index, ml/m ²	0.51 (0.43-0.60)	0.63 (0.58-0.68)	0.04
LVSV, ml	0.64 (0.56-0.71)	0.73 (0.68-0.78)	0.12
LVSV index, ml/m ²	0.65 (0.58-0.73)	0.75 (0.70-0.80)	0.046
LVEF, %	0.57 (0.49-0.65)	0.74 (0.69-0.79)	0.0036
Native T1, ms	0.91 (0.87-0.95)	0.95 (0.93-0.97)	0.14
T2, ms	0.75 (0.68-0.82)	0.69 (0.64-0.74)	0.23
ECV, %	0.98 (0.97-1.00)	0.99 (0.98-1.00)	0.48
AUC = area under curve; NT-proBNP = N-terminal pro-B-type natriuretic peptide; LA = left atrium; CMR = cardiac magnetic resonance; LV = left ventricular; LVEDV = left ventricular end-diastolic volume; LVESV = left ventricular end systolic volume; LVSV = left ventricular stroke volume; LVEF = left ventricular ejection fraction; ECV = extracellular volume.			

Supplemental table 4. Diagnostic performance of relevant laboratory, echocardiographic and CMR parameters in Training Sample and Validation Sample.

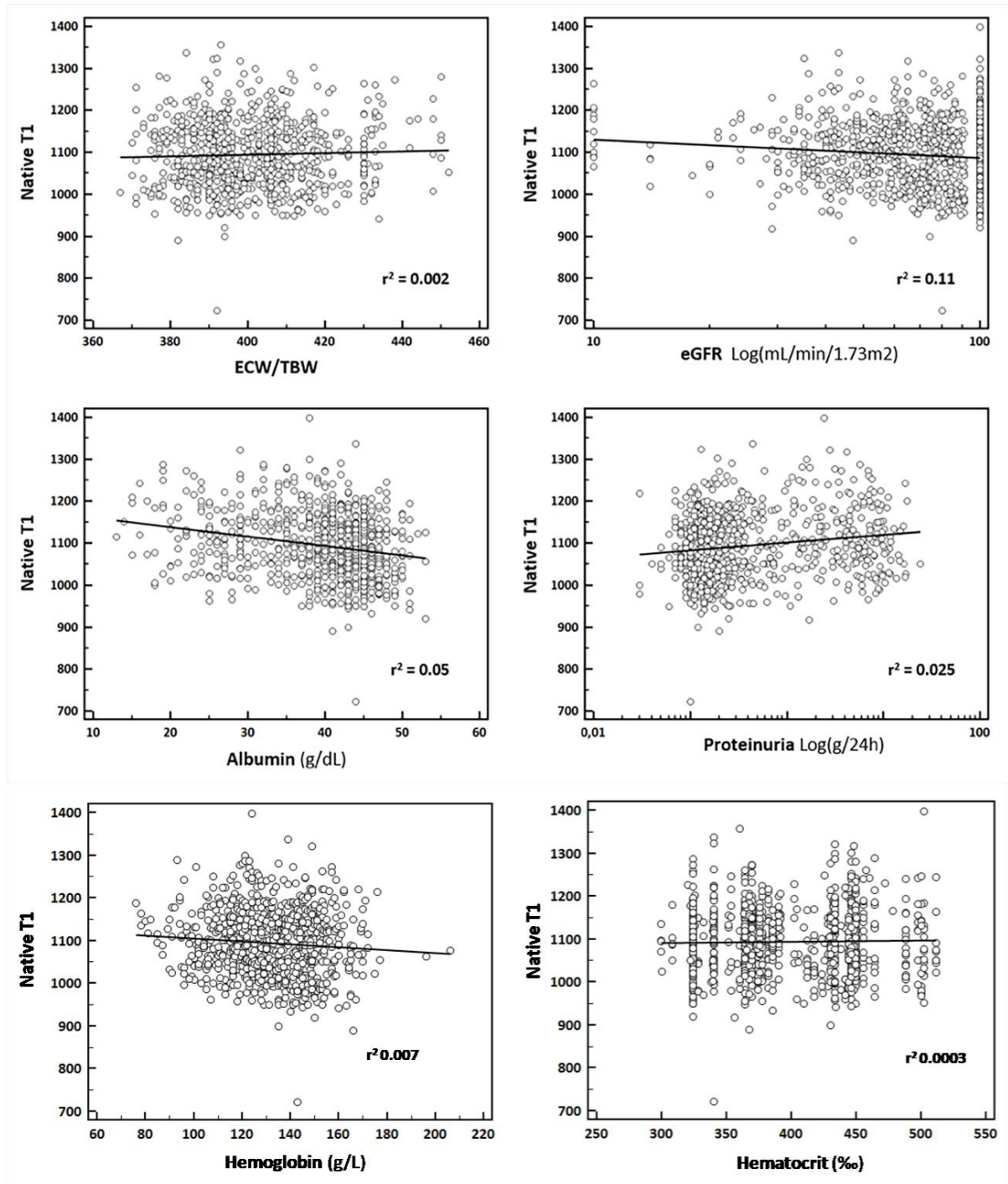
	Training Sample (n = 694)	Validation Sample (n = 174)	p value Training Sample vs Validation Sample
	AUC (95%CI)	AUC (95% CI)	
Biomarkers			
NT-proBNP, ng/l	0.88 (0.85 - 0.92)	0.86 (0.79 - 0.92)	0.63
Echocardiographic parameters			
LA area, cm ²	0.75 (0.70 - 0.80)	0.76 (0.67 - 0.85)	0.86
Lateral E', cm/s	0.74 (0.69 - 0.79)	0.75 (0.66 - 0.84)	0.87
E/E'	0.83 (0.78 - 0.87)	0.83 (0.76 - 0.91)	1.00
E-wave deceleration time, ms	0.64 (0.59 - 0.69)	0.60 (0.49 - 0.70)	0.55
CMR parameters			
LV mass, g	0.85 (0.81-0.89)	0.81 (0.73-0.88)	0.47
LV mass index, g/m ²	0.88 (0.85-0.92)	0.86 (0.79-0.93)	0.64
LVEDV, ml	0.60 (0.55-0.65)	0.56 (0.45-0.67)	0.47
LVEDV index, ml/m ²	0.61 (0.56-0.66)	0.56 (0.46-0.67)	0.33
LVESV, ml	0.57 (0.51-0.62)	0.54 (0.44-0.64)	0.66
LVESV index, ml/m ²	0.58 (0.52-0.63)	0.57 (0.47-0.67)	0.89
LVSV, ml	0.74 (0.69-0.78)	0.69 (0.59-0.79)	0.46
LVSV index, ml/m ²	0.76 (0.72-0.80)	0.69 (0.59-0.79)	0.27
LVEF, %	0.70 (0.65-0.75)	0.68 (0.58-0.78)	0.77
Native T1, ms	0.93 (0.91-0.95)	0.92 (0.90-0.95)	0.48
T2, ms	0.70 (0.65-0.75)	0.73 (0.67-0.82)	0.41
ECV, %	0.99 (0.98-1.00)	0.97 (0.95-1.00)	0.14
AUC = area under curve; NT-proBNP = N-terminal pro-B-type natriuretic peptide; LA = left atrium; CMR = cardiac magnetic resonance; LV = left ventricular; LVEDV = left ventricular end-diastolic volume; LVESV = left ventricular end systolic volume; LVSV = left ventricular stroke volume; LVEF = left ventricular ejection fraction; ECV = extracellular volume.			

Supplemental Figure 1. Native T1 diagnostic accuracy in renal disease and anaemia.

Native T1 diagnostic accuracy for cardiac amyloidosis in the Chronic Kidney Disease (CKD) groups, in patients with nephrotic range proteinuria and in patients with anaemia.

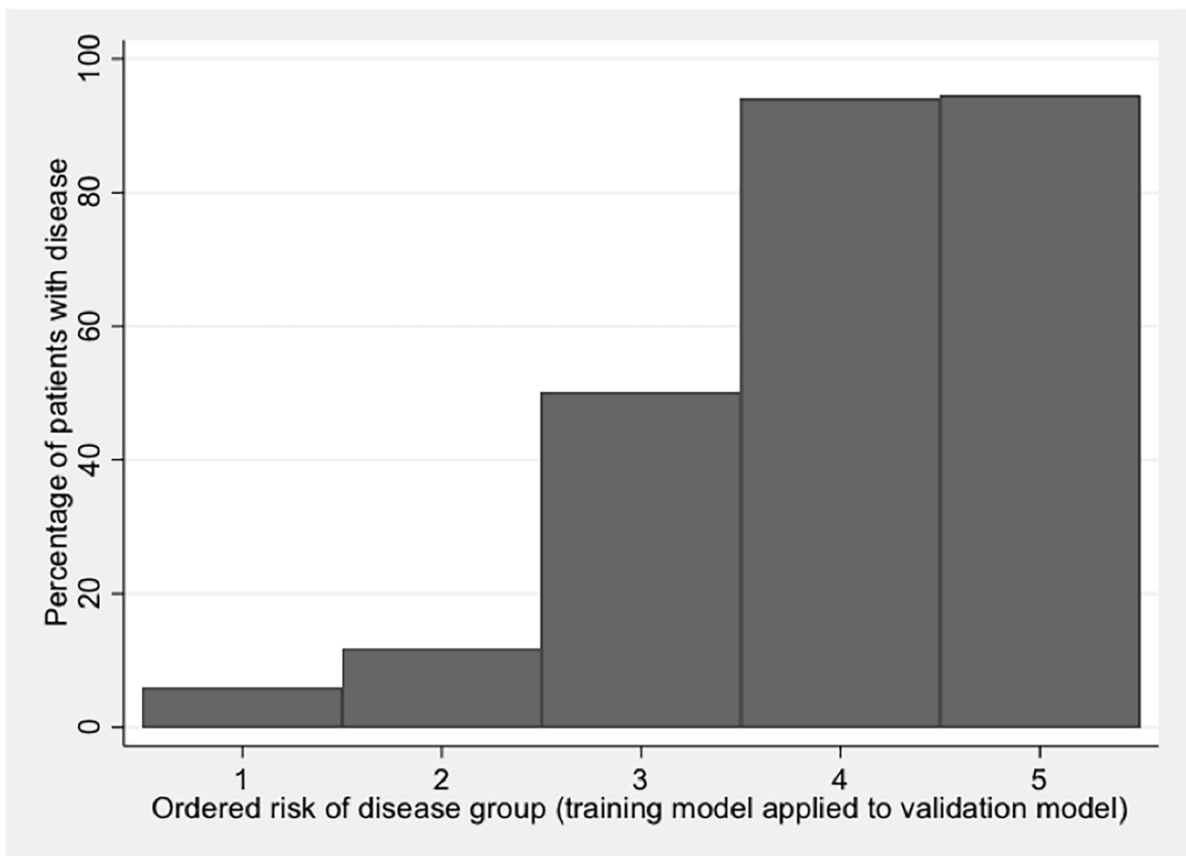


Supplemental figure 2. Relationship between native T1 and ECW/TBW, eGFR, albumin, proteinuria, haemoglobin and haematocrit. Univariable linear regression analysis of native T1 on ECW/TBW, eGFR, albumin, proteinuria, haemoglobin and haematocrit.



Supplemental figure 3. Calibration between training sample and validation sample.

Observed percentage with disease in each quintile group plotted against predicted risk of disease when training model applied to validation set. This shows a stepwise increase in the percentage of patients with the disease as the predicted probability from the model increases, i.e. good calibration.



Supplemental figure 4. Calibration curves. Upper panel: calibration curve of predicted probabilities quintile plotted against observed percentage of disease in quintiles. Lower panel: a second calibration curve with the red results line being close to the perfect calibration line (green vertical line). Both the first and second curve show good calibration.

