T1 mapping tables

Table 3c-i.1. Overview of the T1 mapping indices. ECV – extracellular volume fraction, Ht – hematocrit, ECS – extracellular space, GCAs – gadolinium contrast agent, ROI – region of interest, CMR – cardiovascular magnetic resonance.

Index	**Native T1**	**Postcontrast T1**	**ECV**
Measurement	Direct myocardial T1 measurement	Direct myocardial T1 measurement	Calculation based on T1 measurement of • native and postcontrast myocardium • native and postcontrast blood pool and Hematocrit (Ht).
Calculation	Exponential fit of data-points obtained during T1 relaxation	as for native T1	$ECV = (1-Ht) * \frac{(1/T1_{postcontrastMyo} - 1/T1_{nativeMyo})}{(1/T1_{postcontrastBlood} - 1/T1_{nativeBlood})}$
Main source of influence	Intracellular and extracellular compartment of native myocardium	Gadolinium effects in extracellular compartment	Gadolinium effects in extracellular compartment
Histological relationships	• Intra- and extracellular edema • Interstitial fibrosis • Scar (replacement fibrosis) • Amyloid infiltration • Iron accumulation* • Lipid infiltration* * = causing reduction of T1	Expanded extracellular space: • Replacement fibrosis • Interstitial fibrosis • Extracellular edema • Amyloid infiltration	Expanded extracellular space: • Replacement fibrosis • Interstitial fibrosis • Extracellular edema • Amyloid infiltration
Strengths	1. Simplicity • Single breath-hold acquisition • Contrast-agent free 2. Reproducible postprocessing (based on septal ROI) 3. Normal ranges and discrimination between health and disease 4. Outcome data available	1. Simplicity • Single breath-hold acquisition 2. Close relationship with ECS by tracking of the effects of the GCAs 3. Allows assessment of regional heterogeneity	1. Close relationship with ECS by tracking of the effects of the GCAs 2. Allows assessment of regional heterogeneity 3. Outcome data available

Weaknesses and limitations	1. Normal values sequence specific 2. Diagnostic accuracy sequence dependent (T2 sensitive) 3. Nonspecific for multiple underlying abnormalities 4. Assessment of regional heterogeneity possible in artefact free images	1. Difficult standardization: • No normal ranges • Intra and inter-individual variations in renal clearance • Differences between GCAs 4. Reliance on GCAs 5. Reliance on T1 accuracy	1. Reliance on several measurements obtained ~15 min apart 2. Accumulation of errors with dispersion of values 3. Difficult standardization: • Dispersion of values • Intra and inter-individual variations in renal clearance • Differences between GCAs 4. Nonspecific for multiple underlying abnormalities 5. Requires GCAs 6. Requires contemporaneous hematocrit 7. Reliance on T1 accuracy (difficult in water rich myocardium)
Possible applications	• Screening for subclinical disease • Risk stratification • Grading of disease severity • Monitoring treatment response • Contrast free CMR	• Marker of expanded extracellular space • Assessment of regional heterogeneity	• Marker of expanded extracellular space • Risk stratification • Grading of disease severity

Table 3c-i.2. **Histological correlations with T1 mapping indices in various cardiac conditions.** Types of sequences and a staining method used, as well as a number of patients included, is also reported. Discriminative focus on replacement vs. interstitial fibrosis is a paramount factor influencing the diversity of observed relationships; whereas some authors steered away from the inclusion of replacement fibrosis/LGE affected areas in histological CVF (or accounted for them separately)(1-4)**,** or all-inclusive(5-7). IHD – ischaemic heart disease, VAST variable sampling of k-space in time, NICM – non-ischemic cardiomyopathy, HFpEF – heart failure with preserved ejection fraction, DCM – dilated cardiomyopathy, FLASH-IR - fast low-angle shot – inversion recovery. *shMOLLI is a MOLLI (5(1)1(1)1 (FA 35°) variant utilizing a conditional reconstruction algorithm.

Collagen volume fraction%	**N of patients (cardiac disease)**	**Sequence**	**GCAs (dose and type)**	**T1 Index**	**Staining**	**Pearson r (Sig)**
Heart failure						
Iles(1)	9 (IHD)	VAST	(0.2 mmol/kg gadopentetate dimeglumine)	Postcontrast T1	picrosirius red	-0.7(0.03)
Sibley(8)	47 (NICMs)	Look-Locker	(0.2 mmol/kg gadodiamide)	Postcontrast T1	Masson trichrome	−0.57 (<0.001)
Mascherbauer (9)	9 (HFpEF)	FLASH-IR	(0.2 mmol/kg gadobutrol)	Postcontrast T1	Masson Trichrome/Congo-red	-0.98 (<0.01)
Miller(5)	6 (IHD)	MOLLI 3(3)3(3)5(FA 35°)	(0.2 mmol/kg (gadopentetate dimeglumine)	Native T1	picrosirius red	0.199 (0.437)
				Postcontrast T1		−0.21 (0.69)
				ECV (bolus)		0.945 (0.004)
Aus dem Siepen(6)	45 (DCM)	MOLLI 3(3)3(3)5(FA 35°)	(0.2 mmol/kg gadopentetate dimeglumine)	ECV (bolus)	Acid Fuchsin Orange-G	0.85 (0.01)
Iles(4)	4 (1 IHD, 3 DCM)	VAST	(0.2 mmol/kg gadopentetate dimeglumine)	LGE	Masson Trichrome	0.73 (<0.001)
				Postcontrast T1		-0.64 (0.002)
Kammerlander(2)	36 (mixed group)	MOLLI 5(3)3 (FA 35°) for native acquisition MOLLI 4(1)3(1)2(FA 35°) for	(0.1 mmol/kg of gadobutrol)	ECV (bolus)	Tissue FAXS	0.493 (<0.002)

		postcontrast acquisition				
Aortic stenosis						
Flett(10)	18	FLASH-IR	(0.2 mmol/kg gadoterate meglumine)	ECV (EQ)	picrosirius red	0.94 (R^2= 0.89, 0.001) (Tau=0.71)
Bull(3)	19	*shMOLLI		Native T1	picrosirius red	0.655 (0.002)
Fontana(11)	18	FLASH-IR	(0.2 mmol/kg gadoterate meglumine)	ECV (EQ)	picrosirius red	0.78 (R^2=0.589, p<0.01)
		*shMOLLI				0.83 (R^2=0.685, <0.01)
White(12)	18	*shMOLLI	(0.2 mmol/kg gadoterate meglumine)	ECV (bolus) ECV (EQ)	picrosirius red	0.83 (R^2=0.69, <0.01) 0.84 (R^2=0.71, <0.01)
de Meester de Ravenstein(7)	12	MOLLI 3(3)3(3)5 (FA35°)	(0.2 mmol/kg gadobutrol)	Native T1	picrosirius red	-0.15 (0.64)
				Postcontrast T1		-0.64 (0.024)
				ECV		0.91 (0.001)
Lee(13)	10	MOLLI 3(3)3(3)5(FA35°)		Native T1	picrosirius red	0.77 (<0.01)
Hypertrophic cardiomyopathy						
Flett(10)	8	FLASH-IR	(0.2 mmol/kg gadoterate meglumine)	ECV	picrosirius red	R2=0.62(0.08), Tau=0.52
Iles(4)	8	VAST	(0.2 mmol/kg gadopentetate dimeglumine)	Postcontrast T1	Masson-trichrome	-0.71 (0.01)

Table 3c-i.3. **Intra, interobserver and interstudy variability reported for various sequences and field strengths.**
Septal ROIs (14-16), SAX ROIs for others. Results are reported as Bland-Altman plots: MD±SD (or ±SD) and CoV in brackets when available. AS: aortic stenosis. shMOLLI is a MOLLI (5(1)1(1)1 (FA 35°) variant utilizing a conditional reconstruction algorithm.

	Dabir(14)		**Ferreira** (15)	**Dass** (16)	**Rogers**(17)						**Von Knobelsdorff**(18)	**Liu**(19)	**Messroghli**(20)	**Singh**(21)		**Pica**(22)		**Weingärtner**(23)	
Magnetic field (T)	1.5/3.0		1.5	3.0	1.5			3.0			3.0	3.0	1.5	3.0		1.5		3.0	
N	10		42	8	56			44			20	24	15	10		21		20	
Population	Healthy volunteers		Healthy volunteers and patients	Healthy volunteers and patients	Patients			Patients			Healthy volunteers	Healthy volunteers	Healthy volunteers	AS		Fabry disease		Healthy volunteers	
T1 index	Native T1	Post T1	Native T1	Native T1	Native T1	Post T1	Lambda	Native T1	Post T1	Lambda	Native T1	ECV	Native T1	Native T1	Post T1	Native T1		Native T1	Post T1
Sequence	MOLLI 3(2)3(2)5 (FA 50º)		*shMOLLI	*shMOLLI	MOLLI 3(2)3(2)5 (FA 50º)						MOLLI 3(3)3(3)5 (FA 35º)	MOLLI 3(3)5 (FA 35º)	MOLLI 3’3’5 (FA 50º)	MOLLI 3(3)3(3)5 (FA 50º)		MOLLI 5(3)3 (FA 35º)	*shMOLLI	MOLLI 3(3)5 (FA 35º)	MOLLI 4(1)3(1)2 (FA 35º)
																		SAPPHIRE	
																		SASHA	

Inter-observer V	1.3 ±6.8 (6.1%)	-5.9±9.8 (16.2%)	±5.6	±24	1.5 ±19 (4.3%)	6.3 ±52 (4.3%)	13 ± 19 (7.2%)	3 ± 13 (1.2%)	−6 ± 15 (3.2%)	17 ± 20 (5.1%)	0.5±20.2	-6±17 (6.4%)	-1.1±8.9 (0.9%)	-2.3±3.7 (0.34%)	0±5 (2.31)	(1.1%)	-0.8±2.9% (1.4%)	11.3	2.8
																		13.0	5.3
																		8.8	5.3
Intra-observer V	2.1 ±4.3 (5.2%)	-4.8±7.2 (12.6%)	±5.6		3±11 (1.1%)	5±12 (3.1%)	14 ± 9 (4.1%)	0.3 ± 15 (1.4%)	6.2 ± 71 (2.8%)	19 ± 8 (9.1%)	4.6±18.3	7±06 (2.2%)	2.6±6.7 (0.7%)	0.18 ±5.6 (0.5%)	-1± 4 (1.8%)	(1.2%)	-0.3± 2.2% (1.5%)	7.1	3.6
																		5.1	4.1
																		3.3	3.2
Inter-study V					2.4 ± 9.2 (1.2%)	−8 ± 54 (9.0%)	0.017 ± 0.021 (4.2%)	−1.5 ± 12 (3.6%)	19 ± 65 (12%)	0.016 ± 0.018 (3.5%)				-8.2± 19.3 (1.77%)	2±0.15 (6.5%)	(1.5%)	-0.3±2.2% (0.8%)		

Table 3c-i.4. Overview of studies reporting normative ranges for T1 mapping indices. Studies included if n>50 subjects. Number of participants per group, mean values (mean±SD) are reported for the type of sequence, T1 index and field strength, T1 mapping indices. Postcontrast T1measurements were typically obtained > 15 min after contrast administration. *shMOLLI is a MOLLI (5(1)1(1)1 (FA 35°) variant utilizing a conditional reconstruction algorithm.

Study (n = participants)				**1.5 T**		**3.0 T**	
	Sequence	**GCAs (dose and type)**	**T1 index**	**Myocardium**	**Blood**	**Myocardium**	**Blood**
Piechnik(24) (n= 342)	*shMOLLI		Native T1 (ms)	962±25	1535±76		
Dabir(14) (n=102)	MOLLI 3(2)3(2)5 (FA 50º)	(0.1-0.2 mmol/kg gadobutrol)	Native T1 (ms)	950 ± 21	1551 ± 115	1052 ± 23	1736 ± 139
			ECV (%)	25±4		26±4	
Liu(25) (n=1231)	MOLLI 3(3)3(3)5(FA 35°)	(0.15 mmol/kg gadopentetate dimeglumine)	Native T1 (ms)	977 ± 42			
			ECV%	26.9±2.8			
Von Knobelsdorff(18) (n=60)	MOLLI 3(3)3(3)5(FA 35°)		Native T1 (ms)			1159±≈73	

Table 3c-i.5. Proof of concept studies using T1 mapping in health and disease. Studies included if n>25 subjects/patients' group. Number of participants per group, mean values (mean±SD) are reported for disease entity, the type of sequence, T1 index and field strength, including effect size as a measure of dispersion observed in healthy subjects, as well as the Cohen's d index. The order relates to the order referencing. *shMOLLI is a MOLLI (5(1)1(1)1 (FA 35°) variant utilizing a conditional reconstruction algorithm; **merged results from 1.5 and 3.0 T field strength.

		Health (n)		**Disease (n)**		
	Sequence (dose and type of gadolinium contrast agent)	**Myocardial T1 index**				**Effect size (Cohen's d)**
		1.5 T	3.0 T	1.5 T	3.0 T	
Amyloidosis (ATTR)		**Native T1 (ms)**				
Fontana(26)	*shMOLLI	967 ±34 (n=52)		1097±43 (n=85)		3.5
		Postcontrast T1 (ms)				
Amyloidosis (AL)		**Native T1 (ms)**				
Banypersad(27)	*shMOLLI	954±34 (n=54)		1080±87 (n=100)		1.9
Karamitsos(28)	*shMOLLI	958±20 (n=36)		1140± 61 (n=53)		3.5
Fontana(26)	*shMOLLI	967 ±34 (n=52)		1130±68 (n=79)		3.0
		ECV (%)				
Banypersad(27)	*shMOLLI (0.1 mmol/kg gadoterate meglumine)	25±2 (n=54)		44±12 (n=100)		2.3
Fontana(26)	shMOLLI (0.1 mmol/kg gadoterate meglumine)	27±3 (n=50)		52±7 (n=20)		4.3
Aortic stenosis		**Native T1 (ms)**				
Bull(3)	*shMOLLI	944±16 (n=33)		971±39 (n=109)		0.9
Mahmod(29)	*shMOLLI		1168±27 (n=16)		1196 ± 47 (n=26)	0.7

Lee(13)	MOLLI 3(3)3(3)5 (FA 35°)		1169±21 (n=15)		1214±45 (n=62)	1.3
Singh(21)	MOLLI 3(3)3(3)5 (FA 50°)		1092±35 (n=22)		1103±33 (n=50)	0.32
		ECV (%)				
Singh(21)	MOLLI 3(3)3(3)5 (FA 50°) (0.15 mmol/kg of gadobutrol)		24±2 (n=22)		25±3 (n=50)	0.4
Fontana(26)	*shMOLLI (0.1 mmol/kg gadoterate meglumine)	27±3 (n=50)		31±5 (n=50)		1.0
DCM (non-ischemic)		**Native T1 (ms)**				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º)		1070±55 (n=30)		1239±57 (n=27)	3.0
Puntmann(31)	MOLLI 3(2)3(2)5 (FA 50º)		1055±22 (n=47)		1115±37 (n=82)	1.9
Aus dem Siepen(6)	MOLLI 3(3)5 (FA 35°)	1020±40 (n=56)		1056±62 (n=29)		0.9
		Post-contrast T1(ms)				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol		440±58 (n=30)		355±44 (n=27)	1.6
Aus dem Siepen(6)	MOLLI 3(3)5 (FA 35°) (0.2 mmol/kg gadopentetate dimeglumine)	442±43 (n=56)		420±45 (n=29)		0.5
		ECV (%)				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		27±10 (n=30)		41±10 (n=27)	1.4
Aus dem Siepen(6)	MOLLI 3(3)5 (FA 35°) (0.2 mmol/kg gadopentetate dimeglumine)	23±3 (n=56)		27±4 (n=29)		1.1
Puntmann(31)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		27±9 (n=47)		40±9 (n=82)	1.4
Ugander(32) LGE- LGE+	MOLLI 3(3)5 (FA 35°) (0.15 mmol/kg gadopentetate dimeglumine)	(n=11) 25±3		(n=30) 26±3 37±6		 0.3 2.6
Hypertension		**Native T1 (ms)**				
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º)		1044±18 (n=23)		1058±29 (n=69)	0.6

Treibel(34)	*shMOLLI	965±38 (n=50)		955±30 (n=46)		0.3
		Post-contrast T1 (ms)				
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		446±70 (n=23)		429±60 (n=69)	0.3
Treibel(34)	*shMOLLI (0.1 mmol/kg of gadoterate meglumine)	618±33 (n=50)		578±37 (n=46)		1.1
		ECV (%)				
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		24±6 (n=23)		24±4 (n=69)	0
Treibel(34)	*shMOLLI (0.1 mmol/kg of gadoterate meglumine)	26±2 (n=50)		27± 3 (n=46)		0.5
Hypertrophic cardiomyopathy		**Native T1 (ms)**				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º)		1070±55 (n=30)		1254±43 (n=25)	3.7
Dass(16)	*shMOLLI		1178±13 (n=12)		1209±28 (n=28)	1.4
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º)		1044±18 (n=23)		1169±41 (n=95)	3.9
		Post-contrast T1				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		440±58 (n=30)		363±63 (n=25)	1.3
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		446±70 (n=23)		379±47 (n=95)	1.3
Ellims(35)	VAST (FA 25°) (0.2 mmol/kg gadopentetate dimeglumine)	545±49 (n=25)		483+83 (n=139)		0.9
Ellims(36)	VAST (FA 25°) (0.2 mmol/kg gadopentetate dimeglumine)	561 ± 47 (n=25)		498 ± 80 (n=76)		0.96
		ECV (%)				
Puntmann(30)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		27±9 (n=30)		41±12 (n=25)	1.3
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		24±6 (n=23)		31±6 (n=95)	1.2
Ho CY(37)	Look-Locker (0.15 mmol/kg gadopentetate dimeglumine)	27±1 (n=11)		36±1 (n=37)		9
HCM G+ relatives		**Native T1 (ms)**				

Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º)		1044±18 (n=23)		1105±17 (n=23)	3.4
		Postcontrast T1 (ms)				
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		446±70 (n=23)		434±67 (n=23)	1.7
		ECV%				
Ho CY(37)	Look-Locker (0.15 mmol/kg gadopentetate dimeglumine)	27±1 (n=11)		33±1 (n=29)		6
Hinojar(33)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		24±6 (n=23)		25±4 (n=23)	2.0
Anderson-Fabry disease		**Native T1 (ms)**				
Sado(38)	*shMOLLI	968±32 (n=67)		882±47 (n=44)		2.3
Pica(22)	*shMOLLI	968±32 (n=63)		853±50 (n=63)		2.7
Iron overload		**Native T1 (ms)**				
Sado(39)	*shMOLLI (0.1 mmol/kg gadoterate meglumine)	968±32 (n=67)		827±135 (n=88)		1.4
Acute viral myocarditis		**Native T1 (ms)**				
Hinojar(40)	MOLLI 3(2)3(2)5 (FA 50º)	940±20 (n=18)	1045±23 (n=22)	1064±37 (n=23)	1189±52 (n=38)	3.7/3.4
Ferreira(41)	*shMOLLI	946±23 (n=45)		1010±65 (n=50)		1.4
		Post contrast T1 (ms)				
Hinojar(40)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol) Acute (N=61) Chronic (N=67)	(n=18) 422±68	442±68	(n=23) 373±42 383±43	(n=38) 397±62 426±73	0.5/0.3 0.4/0.2
Chronic viral myocarditis		**Native T1 (ms)**				
Radunski(42)	MOLLI 3(3)5 (FA 35°)	1051±37 (n=21)		1098±57 (n=114)		0.9
Hinojar(40)	MOLLI 3(2)3(2)5 (FA 50º)	940±20 (n=18)	1045±23 (n=22)	995±19 (n=33)	1099±22 (n=34)	2.2/2.2
Bohnen(43)	MOLLI 3(3)5 (FA 35°)	/		1128±~47		

				(n=31)		
		Postcontrast T1 (ms)				
Radunski(42)	MOLLI 3(3)5 (FA 35°) (0.075 mmol/kg gadobenate dimeglumine)	579±45 (n=21)		555±~61 (n=114)		0.4
Hinojar(40)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)	422±68 (n=18)	442±68 (n=22)	383±43 (n=33)	426±73 (n=34)	0.8/0.3
Bohnen(43)	MOLLI 3(3)5 (FA 35°) (0.075 mmol/kg gadobenate dimeglumine)			572±~57 (n=31)		
		ECV (%)				
Radunski(42)	MOLLI 3(3)5 (FA 35°) (0.075 mmol/kg gadobenate dimeglumine)	25±3 (n=21)		31±~4 (n=114)		1.7
Bohnen(43)	MOLLI 3(3)5 (FA 35°) (0.075 mmol/kg gadobenate dimeglumine)			31±~6 (n=31)		
Systemic inflammatory diseases		**Native T1 (ms)**				
Puntmann(44)	MOLLI 3(2)3(2)5 (FA 50º)		1056±27 (n=21)		1152±46 (n=33)	2.5
Hinojar (45)	MOLLI 3(2)3(2)5 (FA 50º)		1057 ± 23 (=n46)		1176 ± 55 (n=76)	2.8
Ntusi(46)	*shMOLLI	961±18 (n=39)		973±27 (n=39)		0.5
Holloway(47)	*shMOLLI	962±18 (n=39)		965±~35 (n=129)		0.8
		Postcontrast T1 (ms)				
Puntmann(44)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		454±53 (n=21)		411±61 (n=33)	0.7
Ntusi(46)	*shMOLLI (0.15 mmol/kg gadopentetate dimeglumine)	468±32 (n=39)		450±40 (n=39)		0.5
		ECV (%)				
Puntmann(44)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)		26±5 (n=21)		30±6 (n=33)	0.7
Ntusi(46)	*shMOLLI (0.15 mmol/kg gadopentetate dimeglumine)	28±2 (n=39)		30±3 (n=39)		0.6
Chemotherapy		**ECV (%)**				

Neilan(48)	Look-Locker (0.15 mmol/kg gadodiamide)	28±2 (n=15)		30±3 (n=42)		0.8
Congenital heart disease		**ECV (%)**				
Broberg(49)**	Look-Locker (0.15 mmol/kg gadodiamide)	25±2 (n=14)		32±5 (n=40)		1.8
Dusenbery(50)	Look-Locker (0.15-0.2mmol/kg gadopentetate dimeglumine)	25±4 (n=27)		27±8 (n=35)		0.3
Acute myocardial infarction		**Native T1 (ms)**				
Messroghli(51)	MOLLI 3'3'5 (FA 50°) Remote myocardium Infarcted myocardium	(n=15) 982±46(19)		(n=24) 1011±66 1197±76		 0.5 3.4
Dall'Armellina(52)	*shMOLLI Remote myocardium Infarcted myocardium		(n=10) 1166±60(58)		(n=41) 1196±56 1257±97	 0.5 1.1
Chronic myocardial infarction		**Native T1 (ms)**				
Messroghli(51)	MOLLI 3'3'5 (FA 50°) Remote myocardium Infarcted myocardium	982±46(19)		(n=24) 987±34 1060±61		 0.1 1.4
Iles(1)	VAST (FA 25°) Remote myocardium	975±62 (n=20)		874±74 (n=25)		1.5
Puntmann(31)	MOLLI 3(2)3(2)5 (FA 50º) Remote myocardium		1055±22 (n=47)		1145±37 (n=91)	3.0
		Postcontrast T1 (ms)				
Iles(1)	VAST (FA 25°) (0.2 mmol/kg gadopentetate dimeglumine) Remote myocardium	543±32 (n=20)		383±17 (n=25)		6.2
		ECV (%)				
Ugander(32) LGE- LGE+	MOLLI 3(3)5 (FA 35°) (0.15 mmol/kg gadopentetate dimeglumine)	(n=11) 25±3		(n=36) 27±3 51±8		 0.6 4.3

Table 3c-i.6. Outcome studies for all-cause mortality (A) and composite cardiac/heart failure (B) endpoints. §All comers – symptomatic patients referred to a clinical CMR as a part of routine work-up (i.e. ischemic and non-ischemic cardiomyopathies), in analyses these studies typically excluded hypertrophic cardiomyopathy cardiac amyloidosis, Anderson-Fabry disease, adult congenital heart disease, see Methods of respective studies for detail. §§Composite heart failure endpoints may vary between the studies – see annotations for details. HFpEF – heart failure with preserved EF; DCM – dilated cardiomyopathy; follow up is expressed as average/ interquartile range/standard deviation (SD); $_b$ – binary variable; tertile –lower-mid tertile vs. upper tertile; NR- Not reported. Order of studies is by the year of publication. P<0.05 is considered significant: *-<0.05; **<0.01. ¥ shMOLLI is a MOLLI (5(1)1(1)1 (FA 35°) variant utilizing a conditional reconstruction algorithm.

A. All-cause mortality						**Univariate**	**Multivariate**
	Study type	**Patient population (n), follow-up (months)**	**Sequence**	**Field Strength (Tesla)**	**Myocardial T1 index**	**HR (95%CI), p-value (*-<0.05; **<0.01)**	**HR (95%CI), p-value (*-<0.05; **<0.01)**
Wong(53)	Observational, single centre	All-comers§ n=793, 9.6 (6-14.4)	Native: MOLLI 5(3)1 (FA35°), Postcontrast: MOLLI 4(1)2(1)1 (FA 35°) (0.2-mmol/kg gadoteridol)	1.5	ECV (%)	1.27 (1.18-1.36)**	1.18(1.09-1.29)**
Banypersad (27)	Observational, single centre	Amyloidosis n=100, 23	¥ shMOLLI (0.1 mmol/kg gadoterate meglumine)	1.5	Native $T1_b$(>1044 ms) ECV_b(>0.45)	5.39 (1.24-23.4)* 3.84(1.53-9.61)**	
Schelbert(54)	Observational, single centre	All-comers§ n=1172, 20.4 (12-29)	Native: MOLLI 5(3)2 (FA 35°), Postcontrast: MOLLI 4(1)2(1)1 (FA 35°) (0.2-mmol/kg gadoteridol)	1.5	ECV (%) ECV_b (>28%)	1.23(1.15-1.3)** 3.60(2.07-6.26)**	1.14(1.06-1.27)**
Puntmann(55)	Observational multicentre	DCM, n=637, 22 (19-25)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)	1.5/3.0	Native T1 (10 ms) ECV (%)	1.1(1.06-1.15)** 1.09(1.05-1.14)**	1.1 (1.07–1.17)**
					Native $T1_b$(>2SD)	5.2(2.4–14.6)**	5.4(2.5–15.2)**
					Native $T1_b$(tertile)	9.1(3.8-19.2)**	10.5(3.8–19.2)**

B. Composite Cardiac and Heart Failure Endpoints§§							
Mascherbauer(9)	Observational, single centre	HFpEF n=100, 23 (±5)	FLASH-IR (0.1 mmol/kg of gadobutrol)	1.5	Postcontrast T1 (ms)	0.99 (0.98-0.99)*	
Schelbert(54)	Observational, single centre	All-comers§ n=1172, 20.4 (12-29)	Native: MOLLI 5(3)1 (FA 35°), Postcontrast: MOLLI 4(1)2(1)1 (FA 35°) (0.2-mmol/kg intravenous gadoteridol)	1.5	ECV (%) ECV_b (>28%)	1.3(1.19-1.4)** 5.25(2.57-10.7)**	1.14(1.06-1.27)
Kammerlander (2)	Observational, single centre	All comers§ n=473 13(±9)	MOLLI 5(3)3 (FA 35°) for native acquisition MOLLI 4(1)3(1)2(FA 35°) for postcontrast acquisition (0.1 mmol/kg of gadobutrol)		ECV (%)	1.11(1.05–1.17)**	1.09(1.03–1.16)**
Puntmann(55)	Observational multicentre	DCM n=637 22 (19-25)	MOLLI 3(2)3(2)5 (FA 50º) (0.2 mmol/kg of gadobutrol)	1.5/3.0	Native T1 (10 ms) ECV (per %)	(1.01–1.10)** 1.05 (1.02–1.08)**	1.07 (1.05–1.1)**
					Native $T1_b$(>2SD)	4.7 (2.5 – 8.7)**	4.8 (2.6–9.1)**
					Native $T1_b$(tertile)	4.8 (2.9-8.0)**	4.7 (2.8–8.0)**

§§Composite cardiac and heart failure outcomes definitions:
(9) hospitalization for HF or death from cardiovascular causes;
(54) HF hospitalization;
(2)cardiac event (hospitalizations for cardiovascular reasons, cardiac deaths), multivariate analyses were performed for imaging parameters separately; in the combined multivariate analysis, clinical and imaging parameters, age, atrial fibrillation, previous CABG, and RV size were identified as the independent predictors.
(55)(death due to HF and HF hospitalization)

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