E-ONLY APPENDIX

Appendix 1. Mean unadjusted neuropsychological subtest scores at study follow-up points by group.

Cognitive Test	Group	Baseline Mean (SD)	# pts	12 months Mean (SD)	# pts	72 months Mean (SD)	# pts.
RAVLT – **Total score** [a]	CABG	39.1 (8.8)	n=152	44.6(10.6)	n=124	39.4 (10.4)	n=96
	OPCAB	38.5 (9.2)	n=72	42.3 (10.3)	n=55	40.0 (11.2)	n=43
	NSCC	41.2 (8.8)	n=99	45.5 (10.4)	n=91	42.9 (11.6)	n=67
	HHC	45.8 (9.4)	n=69	50.1 (11.8)	n=67	47.8 (11.7)	n=60
RAVLT – **Trial 8** [a]	CABG	7.1 (3.2)	n=152	8.7 (3.4)	n=124	7.0 (3.4)	n=96
	OPCAB	7.1 (3.3)	n=71	8.5 (3.1)	n=55	8.1 (3.0)	n=43
	NSCC	7.8 (3.1)	n=99	8.9 (3.5)	n=91	8.2 (3.8)	n=67
	HHC	9.0 (3.7)	n=69	10.4 (3.6)	n=67	9.8 (3.5)	n=60
RAVLT – **Retention** [a]	CABG	70.3 (25.5)	n=152	79.6 (23.7)	n=124	70.0 (26.1)	n=96
	OPCAB	69.8 (25.2)	n=71	83.5 (26.1)	n=55	84.5 (27.6)	n=43
	NSCC	76.6 (23.1)	n=99	80.3 (23.6)	n=91	77.8 (28.1)	n=67
	HHC	76.2 (23.7)	n=69	86.1 (22.2)	n=67	84.6 (23.2)	n=60
RAVLT – **Recognition** [a]	CABG	9.6 (3.7)	n=151	10.7 (3.5)	n=124	9.1 (4.4)	n=95
	OPCAB	9.5 (4.1)	n=72	10.4 (3.2)	n=55	10.4 (3.7)	n=43
	NSCC	10.1 (3.7)	n=99	10.7 (3.9)	n=91	9.5 (5.8)	n=67
	HHC	10.9 (3.6)	n=69	11.7 (2.8)	n=67	11.1 (3.8)	n=60
RCF –	CABG	50.2 (19.1)	n=152	58.0 (20.2)	n=123	50.4 (21.5)	n=94

retention [b]	OPCAB	45.6 (21.8)	n=71	60.0 (20.2)	n=55	53.0 (21.0)	n=43
	NSCC	48.8 (18.1)	n=99	54.7 (20.4)	n=91	51.2 (22.6)	n=65
	HHC	55.3 (18.1)	n=69	65.7 (16.1)	n=67	58.9 (19.4)	n=60
RCF – delayed recall [b]	CABG	16.6 (7.0)	n=152	19.5 (7.4)	n=123	16.1 (7.7)	n=94
	OPCAB	15.4 (7.9)	n=71	20.3 (7.5)	n=55	17.7 (7.7)	n=43
	NSCC	16.4 (6.8)	n=99	18.4 (7.6)	n=91	16.7 (8.0)	n=65
	HHC	18.8 (6.7)	n=69	22.1 (6.3)	n=67	20.0 (7.2)	n=60
RCF – copy [c]	CABG	32.5 (4.7)	n=152	33.1 (3.6)	n=124	31.4 (5.2)	n=94
	OPCAB	32.6 (4.0)	n=71	33.4 (3.4)	n=55	32.5 (3.9)	n=43
	NSCC	33.0 (3.2)	n=99	33.0 (3.4)	n=91	32.4 (3.4)	n=65
	HHC	33.8 (3.0)	n=69	33.4 (3.7)	n=67	33.7 (2.3)	n=60
Block design [c]	CABG	23.2 (10.0)	n=150	26.2 (10.2)	n=123	23.3 (10.2)	n=93
	OPCAB	22.9 (9.2)	n=69	26.0 (9.6)	n=54	25.0 (10.3)	n=43
	NSCC	23.2 (9.5)	n=99	24.2 (9.6)	n=91	23.3 (9.8)	n=66
	HHC	27.8 (9.8)	n=69	28.4 (9.6)	n=67	28.6 (9.3)	n=60
Boston Naming Test [d]	CABG	26.2 (3.7)	n=152	27.1 (2.9)	n=124	25.9 (4.0)	n=95
	OPCAB	26.0 (3.7)	n=71	26.5 (3.7)	n=55	26.3 (3.7)	n=43
	NSCC	26.1 (3.6)	n=99	26.7 (3.3)	n=91	26.5 (3.0)	n=67
	HHC	27.1 (2.8)	n=69	27.6 (2.3)	n=67	27.5 (2.7)	n=60
GP- Dominant hand [e/i]	CABG	107.5 (53.7)	n=152	95.6 (29.9)	n=122	105.5 (36.0)	n=93
	OPCAB	99.6 (30.9)	n=67	94.2 (32.1)	n=54	96.0 (34.4)	n=43
	NSCC	97.9 (29.7)	n=99	90.8 (24.6)	n=91	103.3 (42.0)	n=67
	HHC	82.7 (23.2)	n=69	79.6 (23.1)	n=66	82.8 (30.0)	n=58

GP- Non-dominant hand [e/i]	CABG	119.1 (65.3)	n=149	103.4(30.6)	n=123	116.3 (41.3)	n=94
	OPCAB	107.0 (34.4)	n=68	98.1 (30.3)	n=54	99.0 (30.4)	n=43
	NSCC	107.4 (38.4)	n=98	102.5(35.6)	n=89	111.6 (42.9)	n=66
	HHC	88.4 (30.5)	n=69	86.2 (29.3)	n=67	88.3 (29.2)	n=57
Trail Making Test-Part A [f/i]	CABG	47.1 (24.2)	n=151	40.8 (16.8)	n=123	47.7 (29.5)	n=95
	OPCAB	48.0 (23.0)	n=69	43.4 (17.5)	n=55	42.6 (15.9)	n=43
	NSCC	43.1 (14.4)	n=99	41.0 (15.6)	n=91	46.4 (31.6)	n=67
	HHC	34.2 (11.6)	n=68	33.1 (12.7)	n=67	32.8 (12.6)	n=60
Written Alphabet [f/i]	CABG	26.9 (21.6)	n=149	27.0 (28.2)	n=123	26.2 (15.0)	n=94
	OPCAB	25.8 (13.9)	n=72	30.1 (52.8)	n=55	26.8 (13.1)	n=43
	NSCC	23.2 (10.8)	n=99	23.6 (13.5)	n=90	21.9 (6.9)	n=67
	HHC	18.7 (9.7)	n=69	17.6 (6.9)	n=67	17.9 (6.6)	n=60
RAVLT – Trial 1 [g]	CABG	5.0 (1.4)	n=152	6.1 (2.1)	n=124	5.3 (1.6)	n=96
	OPCAB	4.8 (1.6)	n=72	5.5 (1.5)	n=55	5.1 (1.6)	n=43
	NSCC	5.4 (1.6)	n=99	6.5 (2.1)	n=91	6.1 (2.2)	n=67
	HHC	6.0 (1.3)	n=69	7.3 (2.4)	n=67	6.8 (2.0)	n=60
Mini-Mental Exam attention [g]	CABG	4.0 (1.3)	n=152	4.0 (1.0)	n=124	4.0 (1.3)	n=96
	OPCAB	4.2 (1.1)	n=72	4.0 (1.0)	n=55	4.3 (1.0)	n=43
	NSCC	4.2 (1.2)	n=99	5.0 (1.0)	n=91	4.3 (1.2)	n=67
	HHC	4.4 (1.0)	n=69	5.0 (1.0)	n=67	4.4 (0.9)	n=60
Trail Making Test-Part B [h]	CABG	105.2 (59.0)	n=147	95.4 (48.2)	n=122	105.0 (50.1)	n=91
	OPCAB	96.9 (34.7)	n=68	97.2 (48.4)	n=55	101.1 (47.1)	n=43
	NSCC	95.4 (40.0)	n=99	92.0 (41.5)	n=91	100.4 (50.6)	n=66

	HHC	75.5 (33.4)	n=68	72.9 (33.7)	n=67	74.6 (42.0)	n=60
Letter Number	CABG	-	-	-	-	8.1 (3.5)	n=94
Sequencing	OPCAB					8.8 (2.0)	n=43
	NSCC	-	-	-	-	9.0 (2.4)	n=61
	HHC					9.8 (2.4)	n=60

CABG = coronary artery bypass grafting; GP = Grooved Pegboard; HHC = heart healthy control; NSCC = non-surgical cardiac comparison; OPCAB = off-pump coronary artery bypass grafting; RAVLT = Rey Auditory Verbal Learning Test; RCF = Rey Complex Figure

[a] Verbal Memory domain

[b] Visual Memory domain

[c] Visuoconstruction domain

[d] Language domain

[e] Motor Speed domain (scores truncated at 240 seconds)

[f] Psychomotor Speed domain (Trail-Making scores truncated at 240 seconds)

[g] Attention domain

[h] Executive Function domain (scores truncated at 240 seconds)

[i] this is a timed test, data shown is time in seconds.

Appendix 2. (Supplemental, e-only)

Within group comparison of differences in change scores from baseline to 72 months

	HHC		CABG		OPCAB		NSCC	
Cognitive Domain	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value
Verbal memory	0.18 (-0.02, 0.39)	0.08	-0.05 (-0.20, 0.10)	0.49	0.15 (-0.01, 0.30)	0.07	-0.06 (-0.28, 0.17)	0.63
Visual memory	**0.22** **(0.03, 0.42)**	**0.03**	-0.11 (-0.28, 0.06)	0.20	0.20 (-0.02, 0.41)	0.07	-0.16 (-0.43, 0.11)	0.25
Visuoconstruction	-0.01 (-0.13, 0.13)	0.98	**-0.29** **(-0.43, -0.15)**	**<0.01**	-0.01 (-0.15, 0.16)	0.98	**-0.29** **(-0.46, -0.12)**	**<0.01**
Language	0.10 (-0.08, 0.27)	0.29	-0.18 (-0.38, 0.02)	0.08	-0.20 (-0.45, 0.04)	0.11	-0.11 (-0.29, 0.07)	0.23
Motor Speed	0.04 (-0.17, 0.25)	0.72	-0.16 (-0.32, 0.01)	0.06	0.04 (-0.18, 0.25)	0.75	**-0.37** **(-0.59, -0.14)**	**<0.01**
Psychomotor speed	0.11 (-0.05, 0.26)	0.18	-0.09 (-0.22, 0.04)	0.18	-0.04 (-0.21, 0.12)	0.61	-0.01 (-0.17, 0.16)	0.98
Attention	**0.34** **(0.12, 0.57)**	**<0.01**	0.14 (-0.08, 0.37)	0.22	-0.01 (-0.21, 0.21)	0.99	0.22 (-0.06, 0.50)	0.12
Executive function	0.20 (-0.05, 0.45)	0.11	**-0.19** **(-0.34, -**	**0.02**	-0.01 (-0.18, 0.16)	0.87	-0.10 (-0.29, 0.09)	0.32

			0.03)					
Global	**0.15**	**0.01**	**-0.10**	**0.03**	0.05	0.35	-0.10	0.19
	(0.03, 0.28)		**(-0.19, -**		(-0.05, 0.15)		(-0.25, 0.05)	
			0.01)					

CABG = coronary artery bypass grafting; CI = confidence intervals; HHC = heart healthy

comparison;

NSCC = nonsurgical cardiac comparison; OPCAB = off-pump coronary artery bypass

Appendix 3. (Supplemental, e-only)

Within group comparison of differences in change scores from 12 months to 72 months (late decline)

	HHC		CABG		OPCAB		NSCC	
Cognitive Domain	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value	Difference (95% CI)	*p*-value
Verbal memory	**-0.26** (-0.46, -0.06)	**0.01**	**-0.53** (-0.67, -0.40)	**<0.01**	**-0.19** (-0.35, -0.04)	**0.01**	**-0.37** (-0.61, -0.14)	**<0.01**
Visual memory	**-0.35** (-0.54, -0.16)	**<0.01**	**-0.47** (-0.62, -0.32)	**<0.01**	**-0.43** (-0.60, -0.26)	**<0.01**	**-0.45** (-0.69, -0.22)	**<0.01**
Visuoconstruction	-0.01 (-0.14, 0.11)	0.85	**-0.44** (-0.60, -0.28)	**<0.01**	**-0.19** (-0.36, -0.03)	**0.02**	**-0.34** (-0.50, -0.18)	**<0.01**
Language	-0.09 (-0.27, 0.09)	0.32	**-0.38** (-0.55, -0.20)	**<0.01**	**-0.30** (-0.48, -0.11)	**<0.01**	**-0.28** (-0.44, -0.12)	**<0.01**
Motor Speed	**-0.21** (-0.39, -0.04)	**0.02**	**-0.44** (-0.58, -0.29)	**<0.01**	-0.16 (-0.35, 0.02)	0.08	**-0.66** (-0.86, -0.46)	**<0.01**
Psychomotor speed	-0.05 (-0.20, 0.09)	0.48	**-0.18** (-0.30, -	**0.01**	-0.13 (-0.28, 0.03)	0.10	-0.08 (-0.23, 0.06)	0.26

			0.05)					
Attention	**-0.34** (-0.62, -0.06)	**0.02**	**-0.41** (-0.62, -0.20)	**<0.01**	**-0.28** (-0.48, -0.08)	**0.01**	**-0.38** (-0.63, -0.12)	**<0.01**
Executive function	<0.01 (-0.17, 0.18)	0.98	**-0.33** (-0.46, -0.19)	**<0.01**	-0.15 (-0.35, 0.04)	0.12	**-0.27** (-0.46, -0.09)	**<0.01**
Global	**-0.19** (-0.30, -0.08)	**<0.01**	**-0.42** (-0.50, -0.34)	**<0.01**	**-0.23** (-0.31, -0.14)	**<0.01**	**-0.37** (-0.50, -0.23)	**<0.01**

CABG = coronary artery bypass grafting; CI = confidence intervals; HHC = heart healthy comparison;

NSCC = nonsurgical cardiac comparison; OPCAB = off-pump coronary artery bypass