

SUPPLEMENTAL MATERIAL

Table S1. Characteristics of patients included and not included in the analyses

Variable	Included n = 901	Excluded n = 99	P-Value
Age	65.7 ± 9.9	62.6 ± 12.7	0.005
Sex			0.337
Male	728 (80.8%)	76 (76.8%)	
Female	173 (19.2%)	23 (23.2%)	
Marital status			0.002
Married	630 (70.2%)	56 (57.7%)	
Divorced/separated	134 (14.9%)	25 (25.8%)	
Widowed	81 (9.0%)	5 (5.2%)	
Single/other	53 (5.9%)	11 (11.3%)	
Missing	3	2	
Living alone	179 (20.1%)	23 (24.0%)	0.378
Missing	12	3	
Completed high school	807 (90.3%)	81 (83.5%)	0.038
Missing	7	2	
Finances at the end of the month			< 0.001
Some money left over	537 (60.3%)	39 (40.6%)	
Just enough to make ends meet	247 (27.8%)	37 (38.5%)	
Not enough to make ends meet	106 (11.9%)	20 (20.8%)	
Missing	11	3	
Working status			0.765
No	547 (61.0%)	62 (63.9%)	
Yes, full-time	278 (31.0%)	29 (29.9%)	
Yes, part-time	72 (8.0%)	6 (6.2%)	
Missing	4	2	
Insurance coverage for medications	853 (95.0%)	88 (90.7%)	0.078
Missing	3	2	
Have avoided health care due to costs			0.237
Always	25 (2.8%)	4 (4.1%)	
Frequently	38 (4.3%)	7 (7.1%)	
Occasionally	56 (6.3%)	10 (10.2%)	
Rarely	80 (9.0%)	7 (7.1%)	
Never	694 (77.7%)	70 (71.4%)	
Missing	8	1	
BMI	30.4 ± 5.9	30.7 ± 6.8	0.613

Variable	Included n = 901	Excluded n = 99	P-Value
BMI			0.629
Underweight (<18.5)	7 (0.8%)	0 (0.0%)	
Normal (18.5 to <25)	131 (14.5%)	18 (18.2%)	
Overweight (25 to <30)	340 (37.7%)	31 (31.3%)	
Class I Obesity (30 to <35)	259 (28.7%)	28 (28.3%)	
Class II Obesity (35 to <40)	106 (11.8%)	15 (15.2%)	
Class III Obesity (40+)	58 (6.4%)	7 (7.1%)	
Smoking history			0.026
Current Smoker	111 (12.5%)	22 (22.2%)	
Former Smoker	459 (51.6%)	46 (46.5%)	
Never Smoked	320 (36.0%)	31 (31.3%)	
Missing	11		
Diabetes	362 (40.2%)	50 (50.5%)	0.047
Hypertension	771 (85.6%)	87 (87.9%)	0.532
Prior MI	423 (46.9%)	61 (61.6%)	0.005
Prior PCI	594 (65.9%)	63 (63.6%)	0.648
Prior CABG	338 (37.5%)	27 (27.3%)	0.044
Prior stroke/TIA	82 (9.1%)	9 (9.1%)	0.997
Congestive heart failure	194 (21.5%)	35 (35.4%)	0.001
Chronic kidney disease	112 (12.4%)	23 (23.2%)	0.002
Chronic lung disease	126 (14.0%)	18 (18.2%)	0.258
Number of antianginal meds on arrival			0.059
0	72 (8.0%)	2 (2.0%)	
1	342 (38.0%)	46 (46.5%)	
2	342 (38.0%)	37 (37.4%)	
3	122 (13.5%)	14 (14.1%)	
4	23 (2.6%)	0 (0.0%)	
Ischemia on stress test	438 (89.2%)	47 (94.0%)	0.289
Missing	410	49	
LV ejection fraction	51.4 ± 13.3	47.6 ± 17.0	0.012
Missing	81	6	
LV ejection fraction			0.004
Hyperdynamic: >70%	33 (4.0%)	6 (6.5%)	
Normal: 50-70%	505 (61.6%)	47 (50.5%)	
Mildly Reduced: 40-49%	138 (16.8%)	10 (10.8%)	
Moderately Reduced: 30-39%	78 (9.5%)	13 (14.0%)	
Severely reduced: ≤29%	66 (8.0%)	17 (18.3%)	
Missing	81	6	

Variable	Included n = 901	Excluded n = 99	P-Value
Indication for CTO intervention			0.036
Symptom relief	659 (73.1%)	59 (59.6%)	
Ischemia reduction	97 (10.8%)	13 (13.1%)	
Staged procedure	48 (5.3%)	8 (8.1%)	
Reduced EF	42 (4.7%)	10 (10.1%)	
Other	55 (6.1%)	9 (9.1%)	
Primary CTO vessel			0.526
LAD	182 (20.2%)	26 (26.3%)	
LCX	153 (17.0%)	16 (16.2%)	
LM	8 (0.9%)	0 (0.0%)	
RCA	558 (61.9%)	57 (57.6%)	
Multiple CTO lesions	48 (5.3%)	4 (4.0%)	0.584
Any non-CTO lesions	117 (13.0%)	20 (20.2%)	0.047
<i>JCTO Score Components</i>			
Blunt Cap	574 (63.7%)	62 (62.6%)	0.831
Length > 20mm	553 (61.4%)	63 (63.6%)	0.660
Bending	494 (54.8%)	49 (49.5%)	0.311
Calcification	297 (33.0%)	28 (28.3%)	0.345
Retry	182 (20.2%)	22 (22.2%)	0.635
PHQ-8 Score (BL)	6.2 ± 5.5	7.9 ± 6.6	0.006
Missing	21	4	
PHQ-8 Positive Screen (BL)	210 (23.9%)	36 (37.9%)	0.002
Missing	21	4	
SAQ Physical Limitation (BL)	65.8 ± 26.1	56.5 ± 25.9	0.001
Missing	57	12	
SAQ Angina Frequency (BL)	70.3 ± 27.0	72.2 ± 27.7	0.496
Missing	0	1	
SAQ Angina Frequency (BL)			0.641
Daily (0-30)	104 (11.5%)	12 (12.2%)	
Weekly (40-60)	266 (29.5%)	24 (24.5%)	
Monthly (70-90)	275 (30.5%)	29 (29.6%)	
None (100)	256 (28.4%)	33 (33.7%)	
Missing		1	

Variable	Included n = 901	Excluded n = 99	P-Value
SAQ Q3: Angina frequency			0.493
4 or more times per day	93 (10.4%)	13 (13.3%)	
1-3 times per day	174 (19.4%)	14 (14.3%)	
3 or more times per week	157 (17.5%)	12 (12.2%)	
1-2 times per week	109 (12.1%)	14 (14.3%)	
Less than once a week	98 (10.9%)	11 (11.2%)	
None over the past 4 weeks	267 (29.7%)	34 (34.7%)	
Missing	3	1	
SAQ Q4: Nitroglycerin frequency			0.828
4 or more times per day	18 (2.0%)	3 (3.1%)	
1-3 times per day	64 (7.1%)	8 (8.2%)	
3 or more times per week	48 (5.4%)	3 (3.1%)	
1-2 times per week	55 (6.1%)	5 (5.1%)	
Less than once a week	111 (12.4%)	10 (10.2%)	
None over the past 4 weeks	600 (67.0%)	69 (70.4%)	
Missing	5	1	
SAQ Angina Frequency (BL)			0.641
Daily (0-30)	104 (11.5%)	12 (12.2%)	
Weekly (40-60)	266 (29.5%)	24 (24.5%)	
Monthly (70-90)	275 (30.5%)	29 (29.6%)	
None (100)	256 (28.4%)	33 (33.7%)	
Missing		1	
SAQ Quality of Life (BL)	49.7 ± 27.1	43.0 ± 27.8	0.020
Missing	3	1	
SAQ Summary Score (BL)	61.9 ± 22.5	57.9 ± 22.0	0.094
Missing	0	1	
Rose Dyspnea Scale (BL)	2.2 ± 1.5	2.7 ± 1.5	0.001
Missing	12	1	

BMI – body mass index; MI – myocardial infarction; PCI – percutaneous coronary intervention; CABG – coronary artery bypass graft; TIA – transient ischemic attack; LV – left ventricle; CTO – chronic total occlusion; EF – ejection fraction; PHQ – patient health questionnaire; BL - baseline

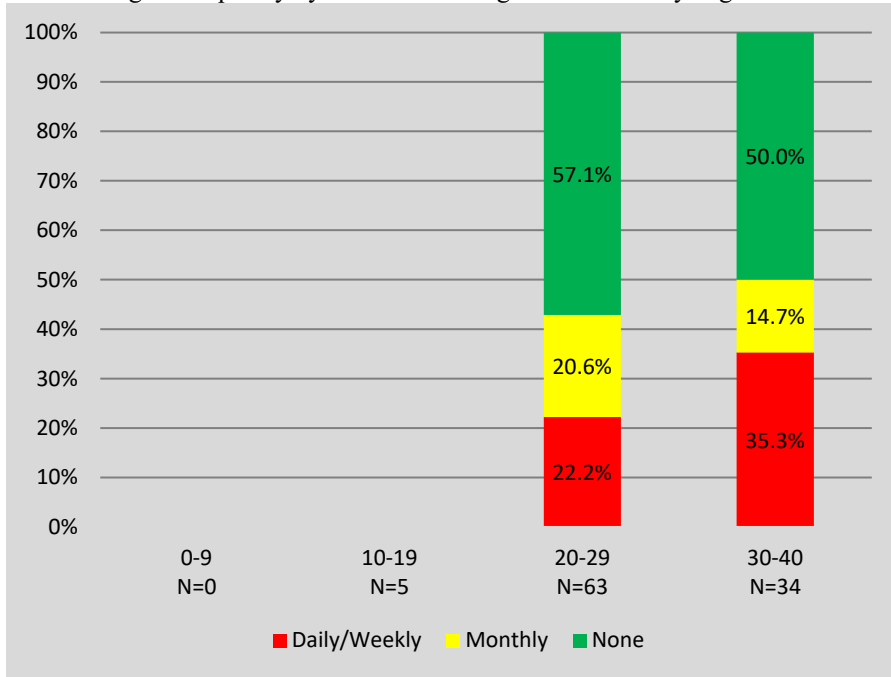
Table S2. Percentage of patients with a ≥ 20 point change in SAQ angina frequency score by patient characteristics in final model and baseline angina

Variable	Value	All patients N=901	Daily (0-30) N=104	Weekly (40-60) N=266	Monthly (70-90) N=275	None (100) N=256
All Patients	–	477/901 (52.9%)	95/104 (91.3%)	214/266 (80.5%)	168/275 (61.1%)	0/256 (0.0%)
Number of antianginal meds on arrival	0	24/72 (33.3%)	2/2 (100.0%)	10/11 (90.9%)	12/21 (57.1%)	0/38 (0.0%)
	1	151/342 (44.2%)	17/19 (89.5%)	65/77 (84.4%)	69/122 (56.6%)	0/124 (0.0%)
	2	206/342 (60.2%)	49/51 (96.1%)	97/113 (85.8%)	60/91 (65.9%)	0/87 (0.0%)
	3	81/122 (66.4%)	22/23 (95.7%)	35/55 (63.6%)	24/38 (63.2%)	0/6 (0.0%)
	4	15/23 (65.2%)	5/9 (55.6%)	7/10 (70.0%)	3/3 (100.0%)	0/1 (0.0%)
Indication for CTO intervention	Symptom relief/ischemia reduction	481/756 (55.3%)	88/97 (90.7%)	195/247 (78.9%)	135/221 (61.1%)	0/191 (0%)
	Staged procedure/reduced EF/Other	59/145 (40.7%)	7/7 (100%)	19/19 (100%)	33/54 (61.1%)	0/65 (0%)
Multiple CTO lesions	No	453/853 (53.1%)	88/95 (92.6%)	204/250 (81.6%)	161/261 (61.7%)	0/247 (0.0%)
	Yes	24/48 (50.0%)	7/9 (77.8%)	10/16 (62.5%)	7/14 (50.0%)	0/9 (0.0%)
PHQ-8 Positive Screen (BL)	No	343/670 (51.2%)	56/62 (90.3%)	158/184 (85.9%)	129/206 (62.6%)	0/218 (0.0%)
	Yes	125/210 (59.5%)	39/41 (95.1%)	51/75 (68.0%)	35/64 (54.7%)	0/30 (0.0%)
SAQ Q3: Angina frequency	4 or more times per day	82/93 (88.2%)	35/39 (89.7%)	47/54 (87.0%)		
	1-3 times per day	147/174 (84.5%)	52/57 (91.2%)	95/117 (81.2%)		
	3 or more times/week but not every day	121/157 (77.1%)	8/8 (100.0%)	53/72 (73.6%)	60/77 (77.9%)	

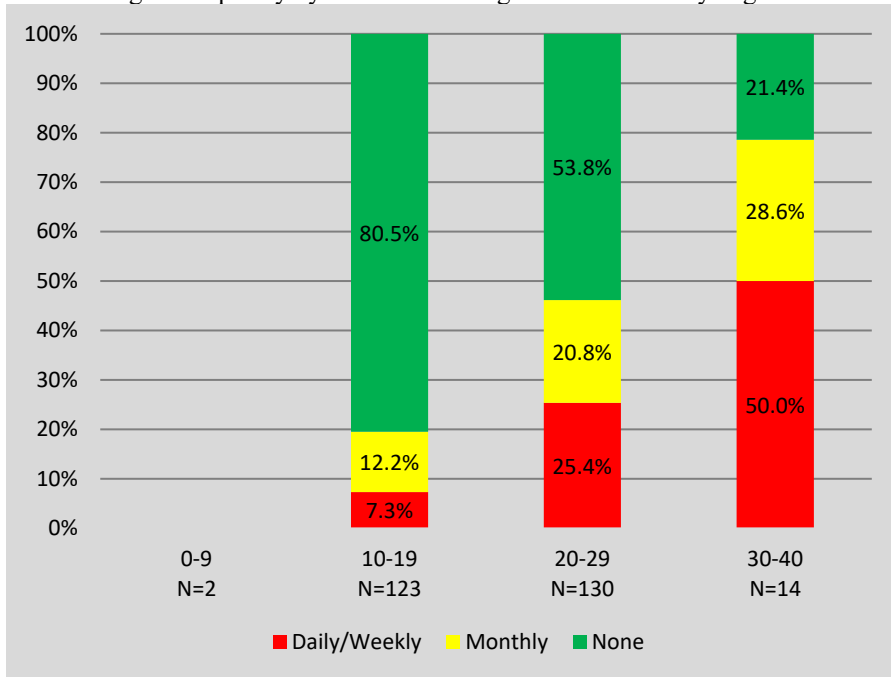
Variable	Value	All patients N=901	Daily (0-30) N=104	Weekly (40-60) N=266	Monthly (70-90) N=275	None (100) N=256
	1-2 times per week	95/109 (87.2%)		16/20 (80.0%)	79/89 (88.8%)	
	Less than once a week	29/98 (29.6%)		2/2 (100.0%)	27/96 (28.1%)	
	None over the past 4 weeks	2/267 (0.7%)			2/13 (15.4%)	0/254 (0.0%)
SAQ Q4: Nitroglycerin frequency	4 or more times per day	18/18 (100.0%)	17/17 (100.0%)	1/1 (100.0%)		
	1-3 times per day	58/64 (90.6%)	54/59 (91.5%)	4/5 (80.0%)		
	3 or more times/week but not every day	37/48 (77.1%)	18/20 (90.0%)	18/27 (66.7%)	1/1 (100.0%)	
	1-2 times per week	42/55 (76.4%)	4/5 (80.0%)	35/46 (76.1%)	3/4 (75.0%)	
	Less than once a week	86/111 (77.5%)		43/54 (79.6%)	43/57 (75.4%)	
	None over the past 4 weeks	233/600 (38.8%)		112/132 (84.8%)	121/213 (56.8%)	0/255 (0.0%)
Rose Dyspnea Scale >=2	No	127/329 (38.6%)	15/15 (100%)	60/67 (89.6%)	52/97 (53.6%)	0/150 (0%)
	Yes	346/560 (61.8%)	76/84 (90.5%)	154/197 (78.2%)	116/176 (65.9%)	0/103 (0%)

Figure S1. Observed 6-month angina frequency by risk score stratified by baseline angina frequency

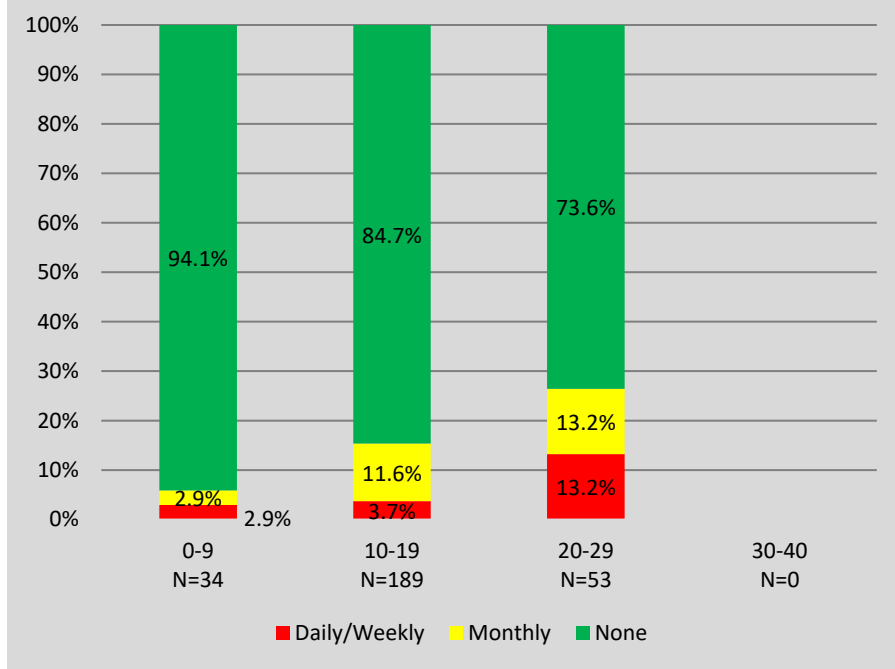
A. 6-month angina frequency by risk score among those with daily angina at baseline



B. 6-month angina frequency by risk score among those with weekly angina at baseline



C. 6-month angina frequency by risk score among those with monthly angina at baseline



D. 6-month angina frequency by risk score among those with no angina at baseline

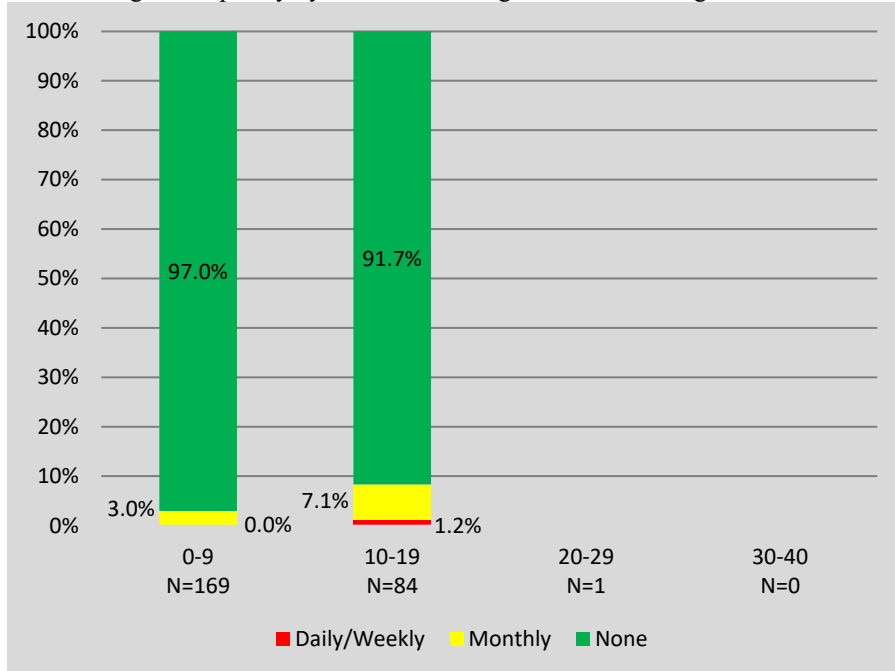


Figure S2. Observed 6-month angina frequency by risk score among patients with procedural success

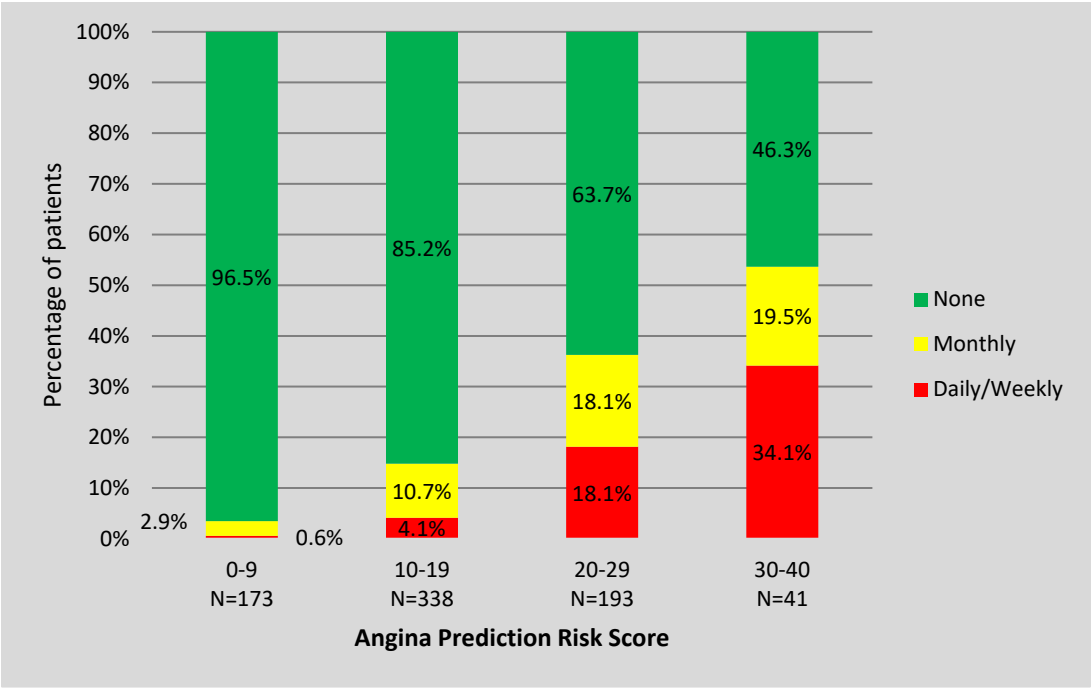


Figure S3. Receiver operating curve of CTO angina prediction model for outcome of ≥ 20 -point increase in SAQ Angina Frequency Score

