

# **Appendix**

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## Appendix 1

### UMLS Semantic Types used to filter the Eligibility Criteria CDEs

Clinical Attribute	Body Location or Region
Group Attribute	Disease or Syndrome
Laboratory Procedure	Pathologic Function
Diagnostic Procedure	Congenital Abnormality
Body Substance	Mental or Behavioral Dysfunction
Laboratory or Test Result	Mental Process
Receptor	Sign or Symptom
Pharmacologic Substance	Acquired Abnormality
Biologically Active Substance	Injury or Poisoning
Antibiotic	Neoplastic Process
Enzyme	Finding
Clinical Drug	Classification
Hazardous or Poisonous Substance	Virus
Chemical Viewed Functionally	Ethnicity
Inorganic Chemical	Behavior Problem
Organic Chemical	Bedtime
Organism Attribute	Exercise
Population Group	Age Group
Family Group	Family Group
Therapeutic or Preventive Procedure	Medical Device
Health Care Activity	Geographic Area
Organism Function	Allergy
Organ or Tissue Function	Individual Behavior
Body Part, Organ, or Organ Component	Regulation or Law

## Appendix 2

### Manual Evaluation of the Machine-powered CDEs for the Cardiovascular Disease Trials

<b>CDE ID</b>	<b>Human-based CDEs</b>	<b>Machine-powered CDEs</b>
1	thrombus	thrombus
2	age	age
3	old	old
4	adult	adult
5	child	child
6	intolerance	intolerance
7	smoke	smoke
8	smoker	smoker
9	pai	pai
10	ldl	ldl
11	triglyceride	triglyceride
12	cholesterol	cholesterol
13	ldl_cholesterol	ldl_cholesterol
14	creatinine	creatinine
15	hdl	hdl
16	hdl_cholesterol	hdl_cholesterol
17	troponin	troponin
18	hemoglobin	hemoglobin
19	abp	abp
20	component	component
21	lipoprotein_cholesterol	
22	hbpm	hbpm
23	low_density_lipoprotein	
24	roc	
25	waist	waist
26	chest	chest
27	wrist	wrist
28	elbow	
29	avf	avf
30	target_vessel	target_vessel
31	leg	leg
32	location	location
33	subcortical	subcortical
34	intracranial	intracranial
35	shoulder	
36	abdominal	abdominal
37	lower_extremity	lower_extremity
38	finger	
39	left_pectoral_region	left_pectoral_region
40	ankle	ankle

41	head	head
42	blood	blood
43	serum	serum
44	right	
45	plasma	plasma
46	urine	urine
47	fluid	fluid
48	blood_glucose	blood_glucose
49	cell	
50	platelet	platelet
51	nyha	nyha
52	classification	classification
53	class	class
54	grade	grade
55	class_ii	class_ii
56	nyha_class_iii	nyha_class_iii
57	class_iii	class_iii
58	stage_i	stage_i
59	class_i	class_i
60	stage_ii	stage_ii
61	new_york_heart_association_classification_ii	new_york_heart_association_classification_ii
62	new_york_heart_association_classification_iii	new_york_heart_association_classification_iii
63	grade_i	grade_i
64	systolic_blood_pressure	systolic_blood_pressure
65	diastolic_blood_pressure	diastolic_blood_pressure
66	bp	bp
67	blood_pressure	blood_pressure
68	diastolic	diastolic
69	mri	mri
70	bmi	bmi
71	height	height
72	stage	stage
73	weight	weight
74	body_mass_index	body_mass_index
75	heart_rate	heart_rate
76	body_weight	body_weight
77	thrombolysis	thrombolysis
78	diastolic_pressure	diastolic_pressure
79	waist_circumference	waist_circumference
80	systolic_pressure	systolic_pressure
81	weigh	
82	pr_interval	pr_interval
83	wall_motion	wall_motion
84	end_diastolic	end_diastolic

85	qrs_interval	qrs_interval
86	ideal_body_weight	ideal_body_weight
87	ecg	ecg
88	diagnose	diagnose
89	echocardiography	echocardiography
90	coronary_angiography	coronary_angiography
91	clinical_diagnosis	clinical_diagnosis
92	angiography	angiography
93	electrocardiogram	electrocardiogram
94	echocardiogram	echocardiogram
95	angiographic	
96	assessment	assessment
97	ct_scan	ct_scan
98	angiogram	angiogram
99	stress_test	stress_test
100	spect	spect
101	angiographically	
102	gfr	gfr
103	scan	
104	ambulatory_blood_pressure_monitoring	ambulatory_blood_pressure_monitoring
105	muga	muga
106	computed_tomography	
107	contrast_ventriculography	contrast_ventriculography
108	mri_scan	mri_scan
109	mra	mra
110	cardiac_biopsy	cardiac_biopsy
111	echocardiographic	
112	physical_exam	physical_exam
113	ct_angiography	ct_angiography
114	diagnostic_catheterization	
115	exercise_stress_test	
116	blood_pressure_measurements	
117	magnetic_resonance_angiography	
118	transthoracic_echocardiography	
119	brain_imaging	brain_imaging
120	ekg	ekg
121	myocardial_perfusion_imaging	myocardial_perfusion_imaging
122	cardiac_ct	cardiac_ct
123	bone_marrow_aspiration	bone_marrow_aspiration
124	radionuclide_angiography	radionuclide_angiography
125	average_systolic_blood_pressure	average_systolic_blood_pressure
126	ventriculography	ventriculography
127	flair	flair
128	neurological_examination	neurological_examination

129	brain_mri	brain_mri
130	hypertension	hypertension
131	stroke	stroke
132	heart_failure	heart_failure
133	icd	icd
134	essential_hypertension	essential_hypertension
135	hypertensive	hypertensive
136	ischemia	ischemia
137	ischemic_stroke	ischemic_stroke
138	acute_myocardial_infarction	acute_myocardial_infarction
139	myocardial_infarction	myocardial_infarction
140	diabetes	diabetes
141	coronary_artery_disease	coronary_artery_disease
142	disease	disease
143	diabetic	diabetic
144	unstable_angina_pectoris	unstable_angina_pectoris
145	diabetes_mellitus	diabetes_mellitus
146	ami	ami
147	angina_pectoris	angina_pectoris
148	angina	angina
149	anterior	anterior
150	high_blood_pressure	high_blood_pressure
151	left_bundle_branch_block	left_bundle_branch_block
152	chd	chd
153	congestive_heart_failure	congestive_heart_failure
154	ischemic_heart_disease	ischemic_heart_disease
155	unstable_angina	unstable_angina
156	cad	cad
157	chronic_heart_failure	chronic_heart_failure
158	chf	chf
159	cardiomyopathy	cardiomyopathy
160	stable_angina_pectoris	stable_angina_pectoris
161	dyslipidemia	dyslipidemia
162	cardiovascular_disease	cardiovascular_disease
163	coronary_heart_disease	coronary_heart_disease
164	chronic_kidney_disease	chronic_kidney_disease
165	systolic_hypertension	systolic_hypertension
166	transient_ischemic_attack	transient_ischemic_attack
167	hypercholesterolemia	hypercholesterolemia
168	abnormality	abnormality
169	deficit	
170	myocardial_ischemia	
171	kidney_disease	
172	stable_angina	
173	ischemic_cardiomyopathy	
174	metabolic_syndrome	metabolic_syndrome

175	ventricular_fibrillation	ventricular_fibrillation
176	sustained_ventricular_tachycardia	sustained_ventricular_tachycardia
177	left_ventricular_hypertrophy	left_ventricular_hypertrophy
178	blind	blind
179	acute_coronary_syndrome	acute_coronary_syndrome
180	lbbb	lbbb
181	dilated_cardiomyopathy	dilated_cardiomyopathy
182	heart_disease	heart_disease
183	hemiparesis	hemiparesis
184	primary_hypertension	primary_hypertension
185	primary_hypercholesterolemia	primary_hypercholesterolemia
186	impairment	impairment
187	cerebral_infarction	cerebral_infarction
188	posterior	
189	acute_anterior_myocardial_infarction	acute_anterior_myocardial_infarction
190	impaired_glucose_tolerance	impaired_glucose_tolerance
191	hyperlipidemia	hyperlipidemia
192	lvh	lvh
193	nstemi	
194	subarachnoid_hemorrhage	
195	lv_hypertrophy	lv_hypertrophy
196	ihd	
197	microalbuminuria	
198	chronic_renal_insufficiency	chronic_renal_insufficiency
199	endovascular	
200	thromboembolic	
201	heart_attack	heart_attack
202	mitral_regurgitation	
203	htn	htn
204	diastolic_hypertension	diastolic_hypertension
205	infection	infection
206	cardiovascular_diseases	cardiovascular_diseases
207	aneurysm	aneurysm
208	cerebral_ischemia	cerebral_ischemia
209	coronary_artery_stenosis	coronary_artery_stenosis
210	liver_disease	liver_disease
211	coronary_disease	
212	cerebral_vascular_accident	
213	obesity	obesity
214	renal_impairment	renal_impairment
215	coronary_stenosis	coronary_stenosis
216	ich	
217	chronic_ischemic_heart_disease	chronic_ischemic_heart_disease
218	recruitment	recruitment

219	peripheral_vascular_disease	peripheral_vascular_disease
220	atherosclerosis	atherosclerosis
221	acute_stroke	acute_stroke
222	brain_aneurysm	brain_aneurysm
223	cardiac_arrest_and_ventricular_fibrillation	cardiac_arrest_and_ventricular_fibrillation
224	acute_coronary_syndromes	acute_coronary_syndromes
225	idiopathic_dilated_cardiomyopathy	idiopathic_dilated_cardiomyopathy
226	comatose	comatose
227	old_myocardial_infarction	old_myocardial_infarction
228	syndrome	syndrome
229	type_ii_diabetes_mellitus	type_ii_diabetes_mellitus
230	anterior_myocardial_infarction	anterior_myocardial_infarction
231	mdrd	
232	cardiovascular_disorders	cardiovascular_disorders
233	cerebrovascular_accident	cerebrovascular_accident
234	death	death
235	sah	
236	hypercholesteremia	
237	enzyme	enzyme
238	reductase	reductase
239	transaminase	
240	african_american	african_american
241	caucasian	caucasian
242	parent	parent
243	family	family
244	family_member	family_member
245	relative	
246	first_degree_relative	first_degree_relative
247	mi	mi
248	sitting_diastolic_blood_pressure	sitting_diastolic_blood_pressure
249	untreated	
250	ejection_fraction	ejection_fraction
251	st_elevation	st_elevation
252	sitting_systolic_blood_pressure	sitting_systolic_blood_pressure
253	st_segment_elevation	st_segment_elevation
254	nyha_class_ii	nyha_class_ii
255	neurological_deficit	neurological_deficit
256	st_depression	st_depression
257	asymptomatic	asymptomatic
258	haemorrhage	haemorrhage
259	problem	problem
260	good_health	good_health
261	gait	gait
262	sexually_active	sexually_active



263	impair	impair
264	sitting_position	
265	contraindicate	contraindicate
266	life	life
267	general_health	general_health
268	awake	awake
269	stress	
270	neglect	neglect
271	mental_state	mental_state
272	resuscitate	resuscitate
273	normal_blood_pressure	normal_blood_pressure
274	nyha_class_i	nyha_class_i
275	cardiovascular_event	
276	pain_onset	
277	vital_sign	
278	ability_to_communicate	ability_to_communicate
279	elevated_blood_pressure	elevated_blood_pressure
280	unresponsiveness	
281	time_of_symptom_onset	
282	mental_status	mental_status
283	physical_findings	
284	unconsciousness	
285	adverse_events	adverse_events
286	fractional_shortening	
287	canadian	canadian
288	taiwan	taiwan
289	european	european
290	community	community
291	reside	
292	cigarette_smoking	cigarette_smoking
293	document	document
294	diagnosis	diagnosis
295	enrollment	enrollment
296	meet	meet
297	schedule	schedule
298	cardiac_catheterization	cardiac_catheterization
299	enroll	
300	evaluation	evaluation
301	prescription	prescription
302	primary_care	primary_care
303	prescribe	prescribe
304	examination	examination
305	visual_estimation	visual_estimation
306	report	
307	eligibility	eligibility
308	hospitalization	hospitalization

309	admission	admission
310	discharge	discharge
311	physical	physical
312	hospital_admission	hospital_admission
313	placement	placement
314	investigation	investigation
315	discontinuation	discontinuation
316	physical_examination	physical_examination
317	assist	assist
318	acute_care	acute_care
319	clinic_visits	clinic_visits
320	position	
321	application	application
322	patient_informed	patient_informed
323	follow_up	
324	on_admission	on_admission
325	intrauterine_device	intrauterine_device
326	patient_care	
327	apply	apply
328	health_care	
329	service	
330	damage	damage
331	emergency	emergency
332	rupture	
333	trauma	trauma
334	nitrate	nitrate
335	therapeutic_goal	therapeutic_goal
336	radionuclide_imaging	radionuclide_imaging
337	stroke_risk	
338	mental_test_score	
339	lvef	lvef
340	left_ventricular_ejection_fraction	left_ventricular_ejection_fraction
341	scale	
342	hematocrit	
343	sitting_blood_pressure	sitting_blood_pressure
344	cardiac_enzymes	cardiac_enzymes
345	screen	screen
346	test	test
347	total_cholesterol	total_cholesterol
348	stemi	
349	calculate	calculate
350	serum_creatinine	serum_creatinine
351	plasma_glucose	plasma_glucose
352	preserve	preserve
353	genotype	genotype

354	provision	
355	creatinine_clearance	creatinine_clearance
356	determination	determination
357	analysis	
358	tlc	tlc
359	serum_triglycerides	serum_triglycerides
360	fasting_blood_glucose	fasting_blood_glucose
361	urinalysis	
362	serum_ldl	serum_ldl
363	device	device
364	stent	stent
365	system	system
366	valve	
367	cuff	cuff
368	pacemaker	pacemaker
369	defibrillator	defibrillator
370	pump	
371	metre	metre
372	telephone	telephone
373	barrier	barrier
374	sphygmomanometer	sphygmomanometer
375	implantable	
376	aortic_balloon_pump	aortic_balloon_pump
377	blood_pressure_monitor	blood_pressure_monitor
378	coil	coil
379	cardioverter	
380	assistive_device	
381	catheter	catheter
382	biventricular_pacemaker	biventricular_pacemaker
383	balloon	balloon
384	arterial_line	arterial_line
385	stand	
386	limb_lead	
387	cane	
388	suffer	
389	depression	depression
390	aphasia	aphasia
391	language_impairment	language_impairment
392	practice	practice
393	understand	
394	experience	experience
395	judgement	judgement
396	satisfy	
397	cognitive_function	
398	perception	perception
399	angiotensin_converting_enzyme	

400	heart_beat	heart_beat
401	movement	movement
402	hemodynamic	hemodynamic
403	vision	
404	sinus_rhythm	sinus_rhythm
405	renal_function	renal_function
406	hemodynamically	
407	kidney_function	kidney_function
408	congo_red_stain	congo_red_stain
409	female	
410	male	male
411	gender	gender
412	qrs_duration	qrs_duration
413	sex	sex
414	patient_is_male	patient_is_male
415	bearing child	bearing child
416	menopausal	menopausal
417	pregnant	pregnant
418	postmenopausal	postmenopausal
419	pregnancy_test	pregnancy_test
420	lactate	lactate
421	pregnancy	pregnancy
422	urine_pregnancy_test	urine_pregnancy_test
423	negative_pregnancy_test	negative_pregnancy_test
424	bear	bear
425	verbal	
426	not_pregnant	not_pregnant
427	child_bearing	child_bearing
428	balance	balance
429	pulse_pressure	pulse_pressure
430	average_diastolic_blood_pressure	average_diastolic_blood_pressure
431	birthday	birthday
432	speech	
433	stenosis	stenosis
434	cardiac_arrest	cardiac_arrest
435	occlusion	occlusion
436	infarct	infarct
437	sterile	sterile
438	ventricular_tachycardia	ventricular_tachycardia
439	amyloid	amyloid
440	dysfunction	dysfunction
441	infarction	infarction
442	complication	complication
443	arrythmia	arrythmia
444	atrial_fibrillation	atrial_fibrillation

445	hemorrhagic_stroke	hemorrhagic_stroke
446	left_ventricular_dysfunction	left_ventricular_dysfunction
447	systolic_dysfunction	systolic_dysfunction
448	diastolic_dysfunction	diastolic_dysfunction
449	left_ventricular_systolic_dysfunction	left_ventricular_systolic_dysfunction
450	shock	
451	tachyarrhythmia	tachyarrhythmia
452	ventricular_arrhythmia	
453	haemorrhagic_stroke	haemorrhagic_stroke
454	insulin_resistance	insulin_resistance
455	fluid_retention	fluid_retention
456	stenose	
457	apnea	apnea
458	hypertrophy	hypertrophy
459	medication	medication
460	dbp	dbp
461	antihypertensive	antihypertensive
462	drug	drug
463	diuretic	diuretic
464	blocker	
465	statin	statin
466	ace_inhibitor	ace_inhibitor
467	beta_blocker	beta_blocker
468	agent	agent
469	inhibitor	
470	acei	
471	angiotensin	
472	antihypertensive_agents	antihypertensive_agents
473	oral_hypoglycemic	
474	insulin	insulin
475	antihypertensive_drugs	antihypertensive_drugs
476	aspirin	aspirin
477	angiotensin_ii_receptor_blocker	angiotensin_ii_receptor_blocker
478	hydralazine	hydralazine
479	antiarrhythmic_drug	antiarrhythmic_drug
480	angiotensin_converting_enzyme_inhibitor	
481	antiarrhythmic	antiarrhythmic
482	enzyme_inhibitor	enzyme_inhibitor
483	simvastatin	simvastatin
484	amlodipine	amlodipine
485	hydrochlorothiazide	hydrochlorothiazide
486	hypertensive_medication	hypertensive_medication
487	nonischemic	nonischemic
488	diuretics	diuretics
489	aldosterone_antagonist	aldosterone_antagonist

490	calcium_channel_blocker	calcium_channel_blocker
491	antihypertensive_drug	antihypertensive_drug
492	atp	atp
493	spermicide	spermicide
494	ezetimibe	ezetimibe
495	aldosterone_inhibitor	aldosterone_inhibitor
496	hctz	hctz
497	clopidogrel	clopidogrel
498	thiazide_diuretic	
499	steroid	steroid
500	survive	survive
501	loop_diuretic	
502	furosemide	furosemide
503	aldosterone	aldosterone
504	digoxin	
505	oral_contraceptives	oral_contraceptives
506	telmisartan	
507	atorvastatin	atorvastatin
508	vasodilator	
509	antiarrhythmic_drugs	antiarrhythmic_drugs
510	irbesartan	irbesartan
511	antihypertensive_agent	
512	valsartan	
513	agonist	
514	medicine	medicine
515	adenosine	adenosine
516	estrogen_antagonist	
517	hyzaar	
518	potassium_sparing_diuretic	
519	hypotensive	hypotensive
520	alcohol	
521	hypoglycemic_agents	hypoglycemic_agents
522	calcium	
523	depend	
524	hcg	
525	candesartan	
526	losartan_potassium	
527	woman	woman
528	man	man
529	single	single
530	native	native
531	participant	participant
532	candidate	
533	group	group
534	individual	individual
535	guardian	guardian

536	american	american
537	witness	witness
538	person	person
539	indicative	
540	legal_guardian	legal_guardian
541	race	race
542	african	
543	cohort	cohort
544	volunteer	volunteer
545	hispanic	hispanic
546	team	
547	men	
548	chinese	
549	black	
550	member_of	
551	angiotensin_receptor	angiotensin_receptor
552	receptor	receptor
553	aldosterone_receptor	aldosterone_receptor
554	informed_consent	informed_consent
555	consent	
556	informed_consent_form	informed_consent_form
557	legislation	
558	informed_consent_obtained	informed_consent_obtained
559	study_protocol	
560	questionnaire	questionnaire
561	consent_form	consent_form
562	symptom	symptom
563	sign	sign
564	chest_pain	chest_pain
565	condition	condition
566	occur	
567	syncope	syncope
568	signs_and_symptoms	signs_and_symptoms
569	hemiplegia	hemiplegia
570	paresis	paresis
571	finding	
572	chest_discomfort	chest_discomfort
573	atypical_chest_pain	atypical_chest_pain
574	framingham	
575	pain	pain
576	shortness_of_breath	
577	feature	
578	dyspnea	
579	discomfort	discomfort
580	pacemaker_rhythm	
581	hypokinesia	hypokinesia

582	thrombotic	
583	treatment	treatment
584	therapy	therapy
585	implant	implant
586	procedure	procedure
587	cabg	cabg
588	treat	treat
589	surgery	surgery
590	implantation	implantation
591	treated_with	treated_with
592	ace	ace
593	placebo	placebo
594	replacement	replacement
595	presence_of	
596	monotherapy	
597	intervention	intervention
598	medical_therapy	medical_therapy
599	regimen	regimen
600	treated_for	treated_for
601	revascularization	revascularization
602	coronary_artery_bypass_graftin g	coronary_artery_bypass_graftin g
603	antihypertensive_therapy	antihypertensive_therapy
604	surgically	surgically
605	administration	administration
606	ptca	ptca
607	percutaneous_coronary_interven tion	percutaneous_coronary_interven tion
608	coronary_artery_bypass_surger y	coronary_artery_bypass_surger y
609	off_pump_coronary_artery_byp ass	off_pump_coronary_artery_byp ass
610	minimally_invasive_direct_coro nary_artery_bypass	minimally_invasive_direct_coro nary_artery_bypass
611	coronary_artery_bypass_graft	coronary_artery_bypass_graft
612	stenting	stenting
613	implante	
614	therapeutic	therapeutic
615	angioplasty	angioplasty
616	rescue	
617	catheterization	catheterization
618	cardiac_surgery	
619	drug_therapy	drug_therapy
620	defibrillation	defibrillation
621	prevention	
622	infusion	
623	rehabilitation	rehabilitation



624	hysterectomy	
625	detection	
626	surgical	
627	tubal_ligation	tubal_ligation
628	bypass	bypass
629	percutaneous_transluminal_cor onary_angioplasty	percutaneous_transluminal_cor onary_angioplasty
630	procedural	
631	thrombolytic_therapy	thrombolytic_therapy
632	release	
633	coronary_artery_bypass	coronary_artery_bypass
634	elute	
635	vad	
636	dialysis	dialysis
637	perfusion	perfusion
638	acute_treatment	acute_treatment
639	coronary_angioplasty	coronary_angioplasty
640	cardioversion	cardioversion
641	treated_by	
642	radiologically	
643	prior_treatment	
644	combination_therapy	combination_therapy
645	heart_transplant	
646	ablation	
647	contraceptive_methods	contraceptive_methods
648	abdominal_aortic_aneurysm_re pair	abdominal_aortic_aneurysm_re pair
649	injection	
650	reperfusion	reperfusion
651	hormone_therapy	hormone_therapy
652	hormone_replacement_therapy	hormone_replacement_therapy
653	primary_prevention	primary_prevention
654	secondary_prevention	secondary_prevention
655	resuscitation	resuscitation
656	dissection	dissection
657	implant_procedure	implant_procedure
658	atherectomy	atherectomy
659	treatment_regimen	treatment_regimen
660	operation	operation
661	aneurysm_repair	aneurysm_repair
662	revision	revision
663	vascular_surgery	vascular_surgery
664	cardiac_surgical_procedure	cardiac_surgical_procedure
665	stent_placement	stent_placement
666	bilateral_oophorectomy	bilateral_oophorectomy
667	ct_protocol	ct_protocol

668	physical_therapy	physical_therapy
669		a1
670		absence_of
671		acc
672		acquisition
673		activation
674		af
675		alone
676		association
677		arrival
678		arrive
679		assess
680		attention
681		b
682		calculation
683		laboratory
684		care
685		carry
686		characterise
687		classify
688		clinic
689		co operate
690		comparison
691		conduct
692		conduction
693		conscious
694		consumption
695		core
696		count
697		counts
698		counts
699		decision
700		deliver
701		delivery
702		disorder
703		dispense
704		dm
705		double
706		dwi
707		emergency_department
708		enable
709		esc
710		fda
711		fill
712		find
713		finish
714		hi
715		hospital
716		hospitalize
717		i
718		i.

719	ii
720	iib
721	iii
722	iiib
723	iiic
724	indicate
725	institution
726	intention
727	interview
728	iv
729	lead
730	life
731	load
732	lv
733	maintain
734	maintenance
735	maintenance
736	mass
737	mb
738	mca
739	medical_center
740	mini
741	mv
742	institutes
743	nih
744	none
745	normal
746	obtain
747	order
748	outpatient_clinic
749	outpatient_clinics
750	pace
751	participation
752	pharmacy
753	pi
754	purchase
755	q
756	receipt
757	recovery
758	recruit
759	repair
760	represent
761	representative
762	response
763	resynchronization
764	run
765	seat
766	secondary
767	secondary_to
768	select
769	separate

770	sjm
771	stop
772	supply
773	support
774	take
775	tg
776	think
777	tia
778	titrate
779	titrate
780	tpa
781	type
782	university_hospital
783	v4
784	visit
785	vt
786	wash
787	wear
788	with_type
789	withdraw
790	withdrawn
791	within_normal_limits
792	write

Appendix 3

**Manual Evaluation of the Machine-powered CDEs  
for the Breast Cancer Trials**

<b>CDE ID</b>	<b>Human-based CDEs</b>	<b>Machine-powered CDEs</b>
1	age	age
2	child	child
3	adult	adult
4	protein	protein
5	serum_albumin	serum_albumin
6	lh rh	
7	her2neu	
8	doxorubicin	doxorubicin
9	mitomycin	mitomycin
10	abstinence	
11	smoker	smoker
12	hemoglobin	hemoglobin
13	bilirubin	bilirubin
14	creatinine	creatinine
15	total_bilirubin	total_bilirubin
16	cish	cish
17	hb	hb
18	urine_protein	urine_protein
19	albumin	albumin
20	na	na
21	triglyceride	triglyceride
22	component	component
23	sodium	sodium
24	creatine	creatine
25	bun	
26	aspartate	
27	hepatic	hepatic
28	axillary	axillary
29	chest	chest
30	nodal	nodal
31	abdominal	abdominal
32	axilla	axilla
33	abdomen	abdomen
34	location	location
35	sole	sole
36	pelvic	
37	pelvis	
38	face	face
39	portal	portal

40	thorax	
41	breast	breast
42	margin	margin
43	node	node
44	organ	
45	bone	bone
46	liver	liver
47	renal	renal
48	brain	brain
49	marrow	marrow
50	lymph_node	lymph_node
51	sentinel_node	sentinel_node
52	lymph_nodes	lymph_nodes
53	axillary_lymph_nodes	axillary_lymph_nodes
54	cardiac	cardiac
55	ipsilateral	ipsilateral
56	axillary_lymph_node	axillary_lymph_node
57	ovary	ovary
58	kidney	kidney
59	chest_wall	chest_wall
60	uterus	uterus
61	sentinel_lymph_node	sentinel_lymph_node
62	diaphragm	diaphragm
63	surgical_margins	surgical_margins
64	follicle	follicle
65	axillary_node	axillary_node
66	arm	arm
67	medullary	medullary
68	breast_tissue	breast_tissue
69	lung	lung
70	oviductal	
71	ovarian	ovarian
72	heart	
73	hand	hand
74	curatively	
75	surgical_specimen	surgical_specimen
76	parenchymal	
77	nipple	
78	abdomen_and_pelvis	
79	oral	
80	urine	urine
81	blood	blood
82	plasma	plasma
83	lymph	lymph
84	blood_sample	blood_sample
85	skin	skin

86	endocrine	endocrine
87	whole_breast	whole_breast
88	central_nervous_system	central_nervous_system
89	platelet	platelet
90	cell	cell
91	neutrophil	neutrophil
92	wbc	wbc
93	leucocyte	leucocyte
94	basal_cell	basal_cell
95	white_blood_cell	white_blood_cell
96	stem_cell	stem_cell
97	granulocyte	granulocyte
98	tumor_cells	tumor_cells
99	grade	
100	stage_i	stage_i
101	stage_iv	stage_iv
102	stage_ii	stage_ii
103	stage_iiib	stage_iiib
104	type	
105	classify	classify
106	categorize	categorize
107	class_i	class_i
108	classification	classification
109	stage_ia	stage_ia
110	stage_iii	stage_iii
111	stage_iiic	stage_iiic
112	stage_iiia	stage_iiia
113	histologic_grade	
114	class	
115	subtype	subtype
116	performance_status	performance_status
117	ecog_performance_status	ecog_performance_status
118	stage	
119	response	
120	unresectable	
121	zubrod	zubrod
122	bmi	
123	zubrod_performance_status	zubrod_performance_status
124	clearance	clearance
125	blood_pressure	blood_pressure
126	weight	weight
127	body_mass_index	body_mass_index
128	age_at_diagnosis	age_at_diagnosis
129	diastolic	diastolic
130	primary_diagnosis	primary_diagnosis
131	exposure_to	

132	eastern_cooperative_oncology_group_performance_status	eastern_cooperative_oncology_group_performance_status
133	prior_hormone_therapy	prior_hormone_therapy
134	cancer_registry	cancer_registry
135	medical_records	medical_records
136	pathologic_stage	pathologic_stage
137	ecog	ecog
138	diagnose	diagnose
139	mri	mri
140	mammogram	mammogram
141	scan	
142	ultrasound	ultrasound
143	assessment	
144	echocardiogram	echocardiogram
145	ct	
146	mammography	mammography
147	bone_scan	bone_scan
148	muga	muga
149	ct_scan	ct_scan
150	muga_scan	muga_scan
151	karnofsky_performance_status	karnofsky_performance_status
152	core_biopsy	core_biopsy
153	karnofsky	karnofsky
154	histological_diagnosis	histological_diagnosis
155	sentinel_node_biopsy	sentinel_node_biopsy
156	pet_scan	pet_scan
157	gault	
158	echo	echo
159	exam	
160	physical_exam	physical_exam
161	echocardiography	echocardiography
162	ecg	ecg
163	spiral_ct_scan	spiral_ct_scan
164	computed_tomography	
165	incisional_biopsy	incisional_biopsy
166	electrocardiogram	electrocardiogram
167	ekg	ekg
168	rad	rad
169	pet	pet
170	karnofsky_index	karnofsky_index
171	breast_biopsy	breast_biopsy
172	hercept	hercept
173	scintigraphy	scintigraphy
174	clinical_diagnosis	
175	spiral_ct	spiral_ct
176	bilateral_mammography	



177	fine_needle_aspiration	fine_needle_aspiration
178	excisional_biopsy	excisional_biopsy
179	magnetic_resonance_imaging	
180	birad	birad
181	liver_imaging	
182	pet_scans	pet_scans
183	echography	
184	cancer_diagnosis	cancer_diagnosis
185	sentinel_lymph_node_biopsy	sentinel_lymph_node_biopsy
186	mammographic	
187	modality	modality
188	surgical_biopsy	
189	tomography	
190	screening_examination	
191	sentinel_lymph_node_mapping	sentinel_lymph_node_mapping
192	ct_scans	
193	tumor_stage	tumor_stage
194	qtc	qtc
195	mammographically	mammographically
196	chest_ct	chest_ct
197	sonography	sonography
198	rheumatologic	rheumatologic
199	computerized_tomography	computerized_tomography
200	disease	disease
201	measurable_disease	measurable_disease
202	advanced_disease	advanced_disease
203	disease_progression	disease_progression
204	evaluable	evaluable
205	asat	asat
206	evaluable_disease	evaluable_disease
207	abnormality	abnormality
208	relapse	relapse
209	amenorrhea	amenorrhea
210	recurrent_disease	recurrent_disease
211	syndrome	syndrome
212	infection	
213	progressive_disease	progressive_disease
214	peripheral_neuropathy	peripheral_neuropathy
215	stable_disease	stable_disease
216	bone_disease	bone_disease
217	congestive_heart_failure	congestive_heart_failure
218	hypertension	hypertension
219	no_evidence_of_disease	no_evidence_of_disease
220	illness	illness
221	neuropathy	neuropathy
222	hot_spots	hot_spots

223	angina	
224	breast_disease	breast_disease
225	tubular	tubular
226	primary_disease	primary_disease
227	lymphedema	lymphedema
228	cessation_of_menses	cessation_of_menses
229	pleural_effusions	pleural_effusions
230	impairment	impairment
231	recurrence_of_disease	recurrence_of_disease
232	adrenal_insufficiency	adrenal_insufficiency
233	angina_pectoris	angina_pectoris
234	incurable	
235	myocardial_infarction	
236	spinal_cord_compression	spinal_cord_compression
237	cavity	cavity
238	disorder	
239	osteoporosis	osteoporosis
240	obese	obese
241	pleural_effusion	pleural_effusion
242	hypercalcemia	
243	heart_disease	
244	chest_wall_disease	chest_wall_disease
245	dementia	dementia
246	cardiovascular_disease	
247	cardiac_disease	
248	sgot	sgot
249	sgpt	sgpt
250	transaminase	transaminase
251	alat	
252	alanine_aminotransferase	alanine_aminotransferase
253	aspartate_aminotransferase	aspartate_aminotransferase
254	aspartate_transaminase	aspartate_transaminase
255	alanine_transaminase	alanine_transaminase
256	enzyme	enzyme
257	ethnicity	ethnicity
258	asian	asian
259	african_american	african_american
260	relative	relative
261	partner	partner
262	mother	mother
263	sister	sister
264	family	family
265	first_degree_relative	first_degree_relative
266	familial	familial
267	spouse	spouse
268	parent	parent

269	family_history	family_history
270	indicate	indicate
271	absence_of	absence_of
272	alone	alone
273	mass	mass
274	unknown	unknown
275	good_health	good_health
276	ascites	ascites
277	untreated	
278	asymptomatic	asymptomatic
279	micrometastasis	micrometastasis
280	contraindicate	contraindicate
281	bleed	bleed
282	alopecia	alopecia
283	examine	examine
284	able_to_comply_with_treatment	able_to_comply_with_treatment
285	ejection_fraction	ejection_fraction
286	source	source
287	invasion	invasion
288	problem	
289	breast_mass	breast_mass
290	axillary_lymph_node_involvement	axillary_lymph_node_involvement
291	medical_care	medical_care
292	positive_lymph_node	positive_lymph_node
293	quality_of_life	quality_of_life
294	musculoskeletal_pain	musculoskeletal_pain
295	extremely_dense	extremely_dense
296	ability_to_swallow	ability_to_swallow
297	heterogeneously_dense	
298	curative_treatment	curative_treatment
299	normal_renal_function	normal_renal_function
300	shortening_fraction	shortening_fraction
301	positive_axillary_lymph_nodes	positive_axillary_lymph_nodes
302	normal_ecg	normal_ecg
303	normal_laboratory	normal_laboratory
304	frail	frail
305	lymph_node_involvement	lymph_node_involvement
306	inconclusive	inconclusive
307	a_mass	a_mass
308	separate	separate
309	able_to_speak	
310	independent	independent
311	in_remission	in_remission
312	sexually_active	sexually_active
313	atypia	atypia

314	adhere	adhere
315	adverse_events	adverse_events
316	michigan	michigan
317	reside	
318	united_states	
319	life_expectancy	life_expectancy
320	sentinel	sentinel
321	diagnosis	
322	document	document
323	enrollment	
324	meet	meet
325	registration	registration
326	evaluation	
327	schedule	schedule
328	eligibility	eligibility
329	enroll	
330	examination	
331	physical_examination	physical_examination
332	clinical_examination	clinical_examination
333	intrauterine_device	intrauterine_device
334	follow_up	follow_up
335	discontinuation	discontinuation
336	report	report
337	register	register
338	screening_procedures	screening_procedures
339	physical	physical
340	drug_administration	drug_administration
341	surveillance	surveillance
342	prescribe	prescribe
343	recommendation	recommendation
344	placement	placement
345	investigation	investigation
346	patient_registration	patient_registration
347	after_treatment	after_treatment
348	hormone	hormone
349	thyroid_hormone	thyroid_hormone
350	participation	
351	visit	
352	performance	performance
353	prejudice	prejudice
354	voluntary	voluntary
355	care	care
356	disclosure	disclosure
357	toxicity	toxicity
358	neurotoxicity	neurotoxicity
359	lvef	lvef

360	platelet_count	platelet_count
361	left_ventricular_ejection_fraction	left_ventricular_ejection_fraction
362	scale	scale
363	within_normal_limits	within_normal_limits
364	lci	lci
365	hgb	hgb
366	hematocrit	hematocrit
367	estrogen_receptor_positive	estrogen_receptor_positive
368	positive_estrogen_receptor	positive_estrogen_receptor
369	biopsy	
370	ihc	ihc
371	serum_creatinine	serum_creatinine
372	test	
373	anc	anc
374	absolute_neutrophil_count	absolute_neutrophil_count
375	creatinine_clearance	creatinine_clearance
376	histochemistry_immuno	
377	screen	screen
378	analysis	analysis
379	calculate	calculate
380	histology	histology
381	hematology	hematology
382	neutrophil_count	neutrophil_count
383	assay	assay
384	determination	determination
385	granulocyte_count	granulocyte_count
386	liver_function_tests	liver_function_tests
387	histochemical_immuno	
388	upc	
389	inr	inr
390	provision	provision
391	laboratory_tests	laboratory_tests
392	cytology	cytology
393	profile	profile
394	plt	plt
395	serum_calcium	serum_calcium
396	ibc	ibc
397	cbc	cbc
398	white_blood_cell_count	white_blood_cell_count
399	estimated_creatinine_clearance	
400	genetic_testing	genetic_testing
401	preservation	preservation
402	serum_cholesterol	serum_cholesterol
403	serum_potassium	serum_potassium
404	international_normalized_ratio	
405	estradiol_level	estradiol_level

406	serum_total_bilirubin	serum_total_bilirubin
407	immunocytochemistry	immunocytochemistry
408	leukocyte_count	leukocyte_count
409	oncotype_dx	
410	genotype	
411	renal_function_tests	renal_function_tests
412	english	english
413	able_to_read	able_to_read
414	spanish	spanish
415	french	french
416	barrier	barrier
417	core_needle_biopsy	core_needle_biopsy
418	core	core
419	carrier	carrier
420	iud	iud
421	system	system
422	device	
423	core_needle	core_needle
424	band	band
425	table	
426	telephone	telephone
427	indicator	indicator
428	tissue_expanders	
429	needle	needle
430	support	
431	psychiatric_disorders	
432	fish	fish
433	fluorescence_in_situ_hybridization	fluorescence_in_situ_hybridization
434	amplification	amplification
435	in_situ_hybridization	in_situ_hybridization
436	fluorescent_in_situ_hybridization	fluorescent_in_situ_hybridization
437	breast_cancer	breast_cancer
438	tumor	tumor
439	metastatic_disease	metastatic_disease
440	metastatic	metastatic
441	metastatic_breast_cancer	metastatic_breast_cancer
442	cancer	
443	invasive_breast_cancer	invasive_breast_cancer
444	primary_tumor	primary_tumor
445	adenocarcinoma_of_the_breast	adenocarcinoma_of_the_breast
446	dci	dci
447	metastasis	metastasis
448	liver_metastases	liver_metastases
449	breast_carcinoma	breast_carcinoma
450	malignancy	

451	ductal_carcinoma_in_situ	ductal_carcinoma_in_situ
452	breast_adenocarcinoma	breast_adenocarcinoma
453	bone_metastases	bone_metastases
454	tumor_size	tumor_size
455	adenocarcinoma	adenocarcinoma
456	brain_metastases	brain_metastases
457	breast_tumor	breast_tumor
458	inflammatory_breast_cancer	inflammatory_breast_cancer
459	bone_metastasis	bone_metastasis
460	carcinoma_of_the_breast	carcinoma_of_the_breast
461	stage_iv_breast_cancer	stage_iv_breast_cancer
462	lobular_carcinoma	lobular_carcinoma
463	invasive_carcinoma_of_the_breast	invasive_carcinoma_of_the_breast
464	liver_metastasis	liver_metastasis
465	metastatic_tumor	metastatic_tumor
466	tumor_tissue	tumor_tissue
467	no_evidence_of_metastatic_disease	no_evidence_of_metastatic_disease
468	invasive_carcinoma	invasive_carcinoma
469	recurrent_breast_cancer	recurrent_breast_cancer
470	invasive_breast_carcinoma	invasive_breast_carcinoma
471	squamous_cell_carcinoma_of_the_skin	squamous_cell_carcinoma_of_the_skin
472	lobular_carcinoma_in_situ	lobular_carcinoma_in_situ
473	breast_cancer_diagnosis	breast_cancer_diagnosis
474	distant_metastasis	distant_metastasis
475	leptomeningeal	
476	ductal_carcinoma	
477	brca	
478	ovarian_cancer	ovarian_cancer
479	invasive_cancer	invasive_cancer
480	unilateral_breast_cancer	unilateral_breast_cancer
481	melanoma_skin	
482	residual_disease	residual_disease
483	carcinoma_in_situ_of_the_cervix	carcinoma_in_situ_of_the_cervix
484	metastatic_lesion	metastatic_lesion
485	carcinoma_of_the_cervix_uteri	
486	tumour_size	tumour_size
487	stage_iii_breast_cancer	stage_iii_breast_cancer
488	cns_metastases	cns_metastases
489	carcinoma	carcinoma
490	cancer_of_the_breast	cancer_of_the_breast
491	metastatic_adenocarcinoma	metastatic_adenocarcinoma
492	mammary_carcinoma	mammary_carcinoma
493	brain_metastasis	brain_metastasis

494	inflammatory_breast_carcinoma	inflammatory_breast_carcinoma
495	primary_carcinoma	primary_carcinoma
496	residual_tumor	residual_tumor
497	bilateral_breast_cancer	bilateral_breast_cancer
498	inflammatory_carcinoma	
499	tumor_progression	
500	solid_tumor	solid_tumor
501	skin_cancer	skin_cancer
502	invasive_ductal_carcinoma	invasive_ductal_carcinoma
503	metastatic_cancer	metastatic_cancer
504	female_breast_cancer	female_breast_cancer
505	metastasize	metastasize
506	carcinoma_of_the_cervix	
507	breast_tumors	breast_tumors
508	renal_function	renal_function
509	hepatic_function	hepatic_function
510	cardiac_function	cardiac_function
511	liver_function	liver_function
512	menses	menses
513	kidney_function	kidney_function
514	menopausal_status	menopausal_status
515	cardiac_ejection_fraction	cardiac_ejection_fraction
516	heal	heal
517	last_menstrual_period	last_menstrual_period
518	menstrual	menstrual
519	menstrual_cycles	menstrual_cycles
520	hematologic_function	hematologic_function
521	heart_function	heart_function
522	ovarian_function	ovarian_function
523	uterine_function	uterine_function
524	wound_healing	wound_healing
525	pulmonary_function	pulmonary_function
526	female	female
527	male	male
528	gender	
529	female_gender	female_gender
530	proband	proband
531	sex	sex
532	postmenopausal	postmenopausal
533	bearing_child	
534	negative_pregnancy_test	negative_pregnancy_test
535	menopausal	menopausal
536	pregnant	pregnant
537	pregnancy_test	pregnancy_test
538	pregnancy	pregnancy
539	bear	bear



540	reproductive	reproductive
541	urine_pregnancy_test	urine_pregnancy_test
542	not_pregnant	not_pregnant
543	lactate	lactate
544	child_bearing	child_bearing
545	fertile	
546	intercourse	intercourse
547	breastfeed	breastfeed
548	menstruation	menstruation
549	progression	progression
550	resistance	resistance
551	pathology	pathology
552	sterile	sterile
553	axillary_adenopathy	axillary_adenopathy
554	microcalcification	microcalcification
555	arrythmia	arrythmia
556	side_effects	side_effects
557	ischemic	ischemic
558	sterility	
559	infiltrate	infiltrate
560	cardiac_arrhythmia	cardiac_arrhythmia
561	atypical_hyperplasia	atypical_hyperplasia
562	oligomenorrhea	oligomenorrhea
563	side_effect	side_effect
564	ulceration	ulceration
565	lytic	
566	regression	regression
567	edema	
568	trastuzumab	trastuzumab
569	alkaline_phosphatase	alkaline_phosphatase
570	taxane	taxane
571	tamoxifen	tamoxifen
572	anthracycline	anthracycline
573	medication	medication
574	estrogen	estrogen
575	herceptin	herceptin
576	bisphosphonate	bisphosphonate
577	agent	
578	aromatase_inhibitor	aromatase_inhibitor
579	drug	drug
580	estradiol	estradiol
581	anastrozole	anastrozole
582	capecitabine	capecitabine
583	progesterone	progesterone
584	lapatinib	lapatinib
585	docetaxel	docetaxel

586	letrozole	letrozole
587	bevacizumab	bevacizumab
588	calcium	calcium
589	paclitaxel	paclitaxel
590	dasatinib	dasatinib
591	spermicide	spermicide
592	aromatase_inhibitors	aromatase_inhibitors
593	epirubicin	epirubicin
594	oral_contraceptives	oral_contraceptives
595	steroid	steroid
596	hcg	hcg
597	progestagen	progestagen
598	birth_control_pills	birth_control_pills
599	cyclophosphamide	cyclophosphamide
600	fulvestrant	fulvestrant
601	adriamycin	adriamycin
602	alp	alp
603	biologic	biologic
604	selective_estrogen_receptor_moderators	selective_estrogen_receptor_moderators
605	taxotere	taxotere
606	raloxifene	raloxifene
607	inhibitor	inhibitor
608	injectable	
609	taxol	taxol
610	vitamin_d	vitamin_d
611	exemestane	
612	faslodex	faslodex
613	prior_anthracycline	
614	steroidal	
615	corticosteroid	corticosteroid
616	vinorelbine	vinorelbine
617	medicine	medicine
618	blocker	
619	antacid	
620	vaccine	vaccine
621	prophylactic	prophylactic
622	arimidex	arimidex
623	glucose	
624	nitrosourea	nitrosourea
625	creatinin	
626	levonorgestrel	levonorgestrel
627	antiestrogen	
628	serm	
629	gemcitabine	gemcitabine
630	anticonvulsant	anticonvulsant

631	investigational_drug	
632	acth	acth
633	experimental_drug	experimental_drug
634	steroidal_aromatase_inhibitor	steroidal_aromatase_inhibitor
635	phosphate	phosphate
636	anthracenedione	anthracenedione
637	alkaline_phosphatases	alkaline_phosphatases
638	tetanus_toxoid	tetanus_toxoid
639	biphosphonate	biphosphonate
640	anticoagulant	anticoagulant
641	xeloda	xeloda
642	agonist	agonist
643	nonsteroidal	nonsteroidal
644	follicle_stimulating_hormone	
645	antibody	
646	cortisol	
647	polysorbate	
648	nsaid	nsaid
649	woman	woman
650	candidate	candidate
651	participant	participant
652	man	man
653	group	group
654	cohort	cohort
655	single	single
656	race	race
657	sexual_partner	sexual_partner
658	volunteer	volunteer
659	african	african
660	hispanic	hispanic
661	er	er
662	pr	pr
663	hormone_receptor	hormone_receptor
664	receptor	receptor
665	progesterone_receptor	progesterone_receptor
666	estrogen_receptor	estrogen_receptor
667	progesterone_receptor_positive	progesterone_receptor_positive
668	epidermal_growth_factor_receptor	epidermal_growth_factor_receptor
669	progesterone_receptors	progesterone_receptors
670	receptor_status	receptor_status
671	hormone_receptors	hormone_receptors
672	progesterone_receptor_status	progesterone_receptor_status
673	estrogen_receptors	
674	oestrogen_receptor	
675	neu_receptor	neu_receptor

676	informed_consent	informed_consent
677	consent	consent
678	informed_consent_form	informed_consent_form
679	informed_consent_document	informed_consent_document
680	questionnaire	questionnaire
681	study_protocol	
682	consent_form	consent_form
683	hipaa	hipaa
684	informed_consent_obtained	informed_consent_obtained
685	icf	icf
686	regulation	regulation
687	sign	sign
688	condition	condition
689	occur	occur
690	inflammatory	inflammatory
691	symptom	symptom
692	finding	finding
693	pain	pain
694	hot_flashes	hot_flashes
695	menstruate	
696	hamper	
697	stiffness	stiffness
698	medical_condition	medical_condition
699	comorbidity	comorbidity
700	specimen	specimen
701	bloc	
702	treatment	
703	chemotherapy	chemotherapy
704	therapy	
705	surgery	surgery
706	radio_therapy	
707	hormonal_therapy	hormonal_therapy
708	regimen	regimen
709	prior_chemotherapy	prior_chemotherapy
710	radiation	radiation
711	neoadjuvant	neoadjuvant
712	procedure	procedure
713	adjuvant_chemotherapy	adjuvant_chemotherapy
714	mastectomy	mastectomy
715	radiation_therapy	radiation_therapy
716	treated_with	treated_with
717	treat	treat
718	lumpectomy	lumpectomy
719	resection	resection
720	endocrine_therapy	endocrine_therapy
721	prior_treatment	

722	adjuvant_therapy	adjuvant_therapy
723	axillary_dissection	axillary_dissection
724	resect	resect
725	bilateral_oophorectomy	bilateral_oophorectomy
726	excision	excision
727	prior_therapy	
728	expression	expression
729	breast_surgery	breast_surgery
730	radiological	radiological
731	hysterectomy	hysterectomy
732	irradiate	irradiate
733	administration	
734	axillary_lymph_node_dissection	axillary_lymph_node_dissection
735	surgical_treatment	surgical_treatment
736	surgically	surgically
737	hormone_therapy	hormone_therapy
738	surgical	
739	breast_conserving_surgery	breast_conserving_surgery
740	oral_medication	oral_medication
741	immunotherapy	immunotherapy
742	systemic_therapy	systemic_therapy
743	chemotherapy_regimen	chemotherapy_regimen
744	avoid	
745	total_mastectomy	total_mastectomy
746	contraceptive_method	contraceptive_method
747	radiologic	radiologic
748	implant	implant
749	cytotoxic_chemotherapy	cytotoxic_chemotherapy
750	irradiation	irradiation
751	prior_radiotherapy	prior_radiotherapy
752	chemo	
753	surgical_excision	surgical_excision
754	intervention	
755	prior_chemotherapy_regimens	prior_chemotherapy_regimens
756	prior_radiation_therapy	prior_radiation_therapy
757	axillary_node_dissection	axillary_node_dissection
758	detect	detect
759	surgical_procedure	
760	hormone_replacement_therapy	hormone_replacement_therapy
761	lymphadenectomy	lymphadenectomy
762	dissection	dissection
763	prior_surgery	prior_surgery
764	prior_hormonal_therapy	prior_hormonal_therapy
765	major_surgery	
766	surgical_resection	surgical_resection
767	tubal_ligation	tubal_ligation

768	brachytherapy	brachytherapy
769	therapeutic	therapeutic
770	hrt	hrt
771	estrogen_therapy	estrogen_therapy
772	sterilisation	sterilisation
773	neoadjuvant_therapy	neoadjuvant_therapy
774	preoperative_chemotherapy	preoperative_chemotherapy
775	partial_mastectomy	partial_mastectomy
776	reconstruction	reconstruction
777	operation	operation
778	supplementation	supplementation
779	replacement_therapy	replacement_therapy
780	transfusion	transfusion
781	surgical_procedures	surgical_procedures
782	removal	removal
783	biologic_therapy	biologic_therapy
784	bilateral_mastectomy	bilateral_mastectomy
785	monotherapy	monotherapy
786	treated_by	
787	radiologically	radiologically
788	prior_adjuvant_chemotherapy	prior_adjuvant_chemotherapy
789	systemic_chemotherapy	systemic_chemotherapy
790	biological_therapy	
791	screening_mammography	screening_mammography
792	cancer_treatment	cancer_treatment
793	vaccination	
794	modified_radical_mastectomy	
795	neoadjuvant_treatment	neoadjuvant_treatment
796	massage	massage
797	detection	
798	transplant	
799	augmentation	
800	anticancer	
801	prior_radiation	
802	local_therapy	local_therapy
803	breast_reconstruction	
804	induction	
805	replacement	
806	oophorectomy	oophorectomy
807	treated_for	treated_for
808	breast_augmentation	
809	sterilise	
810	isolation_procedure	isolation_procedure
811	combination_therapy	
812	chemotherapy_cycle	chemotherapy_cycle
813	adjuvant_radiotherapy	

814	infiltration	infiltration
815	ovarian_suppression	
816	axillary_lymphadenectomy	
817	palliation	palliation
818	remedy	
819	reexcision	reexcision
820	infusion	
821	operative_procedures	operative_procedures
822	investigational_therapy	investigational_therapy
823	high_dose_chemotherapy	
824	breast_cancer_treatment	breast_cancer_treatment
825	local_excision	
826	no_prior_therapy	
827	cytotoxic	
828	hypersensitivity	hypersensitivity
829	allergy	allergy
830		a2
831		a3
832		absence
833		acquire
834		acquisition
835		activity
836		advise
837		ap
838		apply
839		assess
840		assessable
841		assign
842		aware
843		b
844		bc
845		bi
846		brcapro
847		staging
848		carry
849		cc
850		review
851		cessation
852		choose
853		claus_model
854		co operate
855		common
856		comparison
857		conduct
858		contractility
859		count

860	cr
861	creat
862	ctcae
863	decision
864	deliver
865	desire
866	diagnostic
867	dipstick
868	discontinue
869	documentation
870	double
871	edition
872	embed
873	exercise
874	experience
875	feature
876	feed
877	field
878	fill
879	find
880	finish
881	fit
882	fna
883	focus
884	formula
885	gail_model
886	guideline
887	herbal
888	hold
889	i
890	ich
891	ii
892	iib
893	iii
894	iiib
895	iiic
896	index
897	policy
898	iv
899	knowledge
900	level
901	lh
902	lie
903	ln
904	m0
905	maintain



906	make
907	mbc
908	mcl
909	method
910	nd
911	normalize
912	not_eligible
913	not_specified
914	note
915	obtain
916	order
917	outline
918	policy
919	practice
920	preclude
921	preserve
922	prognostic
923	program
924	protect
925	pt
926	ptt
927	reach
928	read
929	recall
930	receipt
931	recovery
932	recruit
933	remove
934	representative
935	reserve
936	response
937	satisfy
938	select
939	send
940	show
941	spread
942	stop
943	strategy
944	survival
945	t1
946	take
947	technique
948	tnm
949	treatment_plan
950	tsh
951	understand

952	understand
953	until
954	upon
955	ve
956	w
957	wash
958	wind
959	withdraw
960	write

## Appendix 4

### Comparison between the ACCF/AHA and the Machine-powered CDEs of the Cardiovascular Disease Trials

The following tables reports the CDEs defined by the ACCF/AHA standard for the cardiovascular diseases and the corresponding CDEs mined by the machine-powered approach. The human-defined CDEs that were not mined by the proposed method are reported highlighted in yellow.

**Table 1: History and Physical Examinations**

ACCF/AHA CDEs	Machine-powered CDEs		
Chest Pain (Angina) or equivalent	Sign_or_Symptom	chest_pain	160
	Disease_or_Syndrome	angina	897
Angina Grade	Disease_or_Syndrome	angina_pectoris	52
	Disease_or_Syndrome	unstable_angina_pectoris	26
	Disease_or_Syndrome	stable_angina	14
	Disease_or_Syndrome	angina_pectoris	52
Heart Failure Class	Disease_or_Syndrome	angina	897
	Classification	class_i	13
	Classification	class_iii	16
	Classification	nyha_class_iii	13
	Classification	nyha	17
	Disease_or_Syndrome	heart_failure	1061
Syncope	Sign_or_Symptom	syncope	27
Date of Syncope	-	-	-
Hypertension	Disease_or_Syndrome	essential_hypertension	74
	Disease_or_Syndrome	hypertension	1552
	Disease_or_Syndrome	pulmonary_hypertension	10
	Disease_or_Syndrome	secondary_hypertension	41
	Disease_or_Syndrome	systolic_hypertension	16
	Disease_or_Syndrome	malignant_hypertension	10

Dyslipidemia	Disease_or_Syndrome	dyslipidemia	26
Diabetes	Disease_or_Syndrome	diabetes	323
	Disease_or_Syndrome	diabetes_mellitus	298
	Disease_or_Syndrome	insulin_dependent_diabetes_mellitus	17
	Disease_or_Syndrome	insulin_dependent_diabetes	11
Tobacco use	Hazardous_or_Poisonous_Substance	tobacco	13
	Behavior_Problem	smoke	42
	Behavior_Problem	smoker	15
Chronic Lung Disease	Disease_or_Syndrome	lung_disease	23
Chronic Kidney Disease	Congenital_Abnormality	solitary_kidney	187
	Disease_or_Syndrome	kidney_disease	19
	Disease_or_Syndrome	chronic_kidney_disease	30
	Disease_or_Syndrome	kidney_failure	21
	Finding	single_kidney	10
Dialysis	Therapeutic_or_Preventive_Procedure	peritoneal_dialysis	13
	Therapeutic_or_Preventive_Procedure	renal_dialysis	13
	Therapeutic_or_Preventive_Procedure	dialysis	234
	Therapeutic_or_Preventive_Procedure	hemodialysis	12
Illicit drug use	Pharmacologic_Substance	drug_abuse	143
HIV infection	Virus	hiv	85
	Virus	hiv_positive	14
	Virus	hiv_infection	14
Atrial arrhythmias	Pathologic_Function	atrial_fibrillation	89
	Disease_or_Syndrome	chronic_atrial_fibrillation	10
Paroxysmal supraventricular tachycardia	Disease_or_Syndrome	sustained_ventricular_tachycardia	116
	Pathologic_Function	ventricular_tachycardia	62
	Pathologic_Function	tachycardia	18

Ventricular arrhythmias	Pathologic_Function	cardiac_arrhythmia	15
	Pathologic_Function	cardiac_arrhythmias	106
	Pathologic_Function	arrhythmias	240
	Pathologic_Function	arrhythmia	27
	Pathologic_Function	tachyarrhythmia	10
	Pathologic_Function	ventricular_arrhythmia	23
<b>Venous thromboembolism</b>	-	-	-
Depression	Mental_or_Behavioral_Dysfunction	depression	36
Coronary artery disease	Disease_or_Syndrome	coronary_artery_disease	418
	Disease_or_Syndrome	left_main_coronary_artery_disease	78
	Disease_or_Syndrome	coronary_artery_stenosis	37
<b>Cerebral artery disease</b>	-	-	-
Peripheral artery disease	Disease_or_Syndrome	peripheral_vascular_disease	31
Aorta disease	Disease_or_Syndrome	aortic_stenosis	33
	Disease_or_Syndrome	abdominal_aortic_aneurysm	17
Renal artery disease	Disease_or_Syndrome	renal_artery_stenosis	191
Myocardial infarction	Disease_or_Syndrome	myocardial_infarction	1706
	Disease_or_Syndrome	acute_myocardial_infarction	492
	Disease_or_Syndrome	myocardial_ischemia	120
	Finding	recent_myocardial_infarction	43
Date of myocardial infarction	Disease_or_Syndrome	myocardial_infarction	1706
Sudden cardiac arrest	Pathologic_Function	cardiac_arrest	678
	Sign_or_Symptom	arrest	18
Date of cardiac arrest	Pathologic_Function	cardiac_arrest	678
Heart failure	Disease_or_Syndrome	heart_failure	1061
	Disease_or_Syndrome	chronic_heart_failure	133
	Disease_or_Syndrome	chronic_congestive_heart_failure	10

	Disease_or_Syndrome	congestive_heart_failure	261
Family History	Family_Group	family_history_of	24
	Family_Group	family	20
	Family_Group	family_member	16
	Family_Group	parent	13
Sudden cardiac death	Disease_or_Syndrome	death	25
Systolic blood pressure	Finding	sitting_systolic_blood_pressure	111
Diastolic blood pressure	Finding	sitting_diastolic_blood_pressure	275
Height	Clinical_Attribute	height	13
Weight	Clinical_Attribute	weight	15
Waist	Body_Location_or_Region	waist	66
Heart rate	-	-	-

**Summary:**

37 CDEs defined by ACCF/AHA

33 CDEs mined by the Machine-powered approach

Coverage: 33/37 = 89.2%

**Table 2: Laboratory Results**

ACCF/AHA CDEs	Machine-powered CDEs		
Total cholesterol	Laboratory_Procedure	total_cholesterol	55
LDL cholesterol	Biologically_Active_Substance	ldl_cholesterol	43
	Biologically_Active_Substance	ldl	117
HDL cholesterol	Biologically_Active_Substance	hdl_cholesterol	15
	Biologically_Active_Substance	hdl	53
	Biologically_Active_Substance	cholesterol	34
Triglycerides	Biologically_Active_Substance	triglycerides	116
Fast blood sugar	-	-	-

Creatinine	Biologically_Active_Substance	creatinine	604
	Laboratory_or_Test_Result	serum_creatinine_level	43
	Laboratory_or_Test_Result	creatinine_level	58
<b>BUN</b>	-	-	-
Sodium	Pathologic_Function	sodium_depletion	17
Hemoglobin	Biologically_Active_Substance	hemoglobin	151
<b>Hemoglobin A1C</b>	-	-	-
Hematocrit	Laboratory_or_Test_Result	hematocrit	68

**Summary:**

11 CDEs defined by ACCF/AHA

8 CDEs mined by the Machine-powered approach

**Coverage: 8/11 = 72.7%**

**Table 3: Diagnostic and Therapeutic Procedures**

ACCF/AHA CDEs	Machine-powered CDEs		
Cardiac diagnostic	Diagnostic_Procedure	ecg	954
	Diagnostic_Procedure	echo	152
	Diagnostic_Procedure	echocardiogram	48
	Diagnostic_Procedure	echocardiography	136
	Diagnostic_Procedure	echocardiographic	10
	Diagnostic_Procedure	electrocardiogram	26
	Diagnostic_Procedure	angiogram	47
	Diagnostic_Procedure	angiography	188
	Diagnostic_Procedure	ct_angiography	10
	Diagnostic_Procedure	angiographic	304
	Diagnostic_Procedure	angiographically	25
	Diagnostic_Procedure	coronary_angiography	314

	Diagnostic_Procedure	scan(General)	12
	Diagnostic_Procedure	ct_scan	26
	Diagnostic_Procedure	mri_scan	13
	Diagnostic_Procedure	mri	191
	Diagnostic_Procedure	diagnostic_catheterization	14
	Diagnostic_Procedure	clinical_diagnosis(General)	32
	Diagnostic_Procedure	diagnosed(General)	128
	Diagnostic_Procedure	cardiac_biopsy	92
	Diagnostic_Procedure	ekg	12
	Diagnostic_Procedure	gfr	129
	Diagnostic_Procedure	asa	39
	Diagnostic_Procedure	ct	31
	Diagnostic_Procedure	spect	42
	Diagnostic_Procedure	gault	22
	Diagnostic_Procedure	qtc	10
Date of cardia diagnosis	-	-	-
Diagnostic Procedure Results	-	-	-
Ejection faction (Quantity)	Laboratory_or_Test_Result	lvef	811
	Laboratory_or_Test_Result	left_ventricular_ejection_fraction	262
Ejection faction (Quality)	Laboratory_or_Test_Result	lvef	811
Left ventricle size (Quantity)	-	-	-
Left ventricle size (Quality)	-	-	-
Left atrium size (Quantity)	-	-	-
Aortic valve area	Disease_or_Syndrome	aortic_stenosis	33
Aortic valve regurgitation	-	-	-
Mitral valve area	Disease_or_Syndrome	mitral_valve_stenosis	11
Mitral valve regurgitation	Disease_or_Syndrome	mitral_regurgitation	11



Stress test result	Diagnostic_Procedure	exercise_stress_test	11
	Diagnostic_Procedure	stress_test	77
Myocardium ischemic amount	Pathologic_Function	ischemic	630
Coronary calcium score	Organ_or_Tissue_Function	calcification	13
Coronary artery disease vessels	-	-	-
Left coronary artery stenosis	Disease_or_Syndrome	left_main_coronary_artery_disease	78
Proximal LAD coronary stenosis	-	-	-
Third degree AV block	Disease_or_Syndrome	third_degree_heart_block	77
Left bundle branch block	Disease_or_Syndrome	left_bundle_branch_block	109
Intraventricular conduction delay*	Organism_Attribute	qrs	130
	Organism_Attribute	qrs_duration	82
Therapeutic Procedure	Therapeutic_or_Preventive_Procedure	treatment(General)	2702
	Therapeutic_or_Preventive_Procedure	resuscitation	42
	Therapeutic_or_Preventive_Procedure	implantation	325
	Therapeutic_or_Preventive_Procedure	transplant	27
	Therapeutic_or_Preventive_Procedure	heart_transplant	179
Date of Therapeutic Procedure	Temporal Concept	-	-
Implanted Device	Medical_Device	implantable_defibrillator	18
	Medical_Device	defibrillator	209
	Medical_Device	biventricular_pacemaker	18
	Medical_Device	permanent_pacemaker	15
	Medical_Device	pacemaker	355

**Summary:**

24 CDEs defined by ACCF/AHA

16 CDEs mined by the Machine-powered approach

**Coverage: 16/24 = 66.7%**

**Table 4: Pharmacological Therapies**

ACCF/AHA CDEs	Machine-powered CDEs		
Pharmacological Therapy	Pharmacologic_Substance	investigational_drug (general)	703
	Pharmacologic_Substance	medication (general)	378
	Therapeutic_or_Preventive_Procedure	drug_therapy	23
	Therapeutic_or_Preventive_Procedure	medical_therapy	38
Aspirin	Pharmacologic_Substance	aspirin	102
P2Y12 blocker	Receptor	p2y12	64
Nonsteroidal anti-inflammatory	Pharmacologic_Substance	nsaid	21
Steroid	Pharmacologic_Substance	steroid	20
Cyclo-oxygenase 2 inhibitor	-	-	-
Anticoagulant	Therapeutic_or_Preventive_Procedure	anticoagulant_therapy	67
	Therapeutic_or_Preventive_Procedure	anticoagulation_therapy	12
	Therapeutic_or_Preventive_Procedure	anticoagulation	15
	Pharmacologic_Substance	anticoagulant	12
Alpha blocker	Pharmacologic_Substance	alpha_blocker	68
Beta blocker	Pharmacologic_Substance	beta_blocker	42
ACE inhibitor	Pharmacologic_Substance	ace_inhibitor	46
ARB	Pharmacologic_Substance	arb	75
Calcium channel blocker	Pharmacologic_Substance	calcium_channel_blocker	28
Antiarrhythmics	Pharmacologic_Substance	antiarrhythmic_drug	74
	Pharmacologic_Substance	antiarrhythmic	110
Direct rennin inhibitors	-	-	-
Nitrate	Inorganic_Chemical	Nitrate	12
Statin	Pharmacologic_Substance	statin	240
Nonstatin antilipidemic	-	-	-
Insulin	Pharmacologic_Substance	insulin	295

Noninsulin hypoglycemic	Disease_or_Syndrome	hypothyroidism	12
Diuretic	Pharmacologic_Substance	diuretic	134
	Pharmacologic_Substance	diuretics	13
Aldosterone receptor antagonist	Receptor	aldosterone_receptor	16
	Pharmacologic_Substance	aldosterone_antagonist	76

**Summary:**

21 CDEs defined by ACCF/AHA

18 CDEs mined by the Machine-powered approach

Coverage: 18/21 = 85.7%

**Table 5: Outcomes**

ACCF/AHA CDEs	Machine-powered CDEs		
Death	Disease_or_Syndrome	death	25
Date of Death	-	-	-

**Summary:**

2 CDEs defined by ACCF/AHA

1 CDE mined by the Machine-powered approach

Coverage: 1/2 = 50.0%