Smartphone detection of atrial fibrillation using photoplethysmography:

A systematic review and meta-analysis

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Supplementary material

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Table S1: Search strategy for EMBASE and MEDLINE databases

Search	Hits
('mobile application'/exp OR 'mobile app':ti,ab,de,tn,dn,kw OR 'mobile application':ti,ab,de,tn,dn,kw OR 'mobile applications':ti,ab,de,tn,dn,kw OR 'mobile apps':ti,ab,de,tn,dn,kw OR 'portable software app':ti,ab,de,tn,dn,kw OR 'portable software application':ti,ab,de,tn,dn,kw OR 'portable software applications':ti,ab,de,tn,dn,kw OR 'portable software apps':ti,ab,de,tn,dn,kw OR 'cell phone use'/exp OR 'cell phone usage':ti,ab,de,tn,dn,kw OR 'cell phone use':ti,ab,de,tn,dn,kw OR 'cell phone utilization':ti,ab,de,tn,dn,kw OR 'cellphone usage':ti,ab,de,tn,dn,kw OR 'cellphone use':ti,ab,de,tn,dn,kw OR 'cellphone utilization':ti,ab,de,tn,dn,kw OR 'mobile phone usage':ti,ab,de,tn,dn,kw OR 'mobile phone use':ti,ab,de,tn,dn,kw OR 'mobile phone utilization':ti,ab,de,tn,dn,kw OR 'mobile phone'/exp OR 'cell phone':ti,ab,de,tn,dn,kw OR 'cell phones':ti,ab,de,tn,dn,kw OR 'cellphone':ti,ab,de,tn,dn,kw OR 'cellphones':ti,ab,de,tn,dn,kw OR 'cellular phone':ti,ab,de,tn,dn,kw OR 'cellular telephone':ti,ab,de,tn,dn,kw OR 'mobile phone':ti,ab,de,tn,dn,kw OR 'mobile telephone':ti,ab,de,tn,dn,kw OR 'smartphone'/exp OR 'smart phone*':ti,ab,de,tn,dn,kw OR smartphone*:ti,ab,de,tn,dn,kw OR 'mobile app*':ti,ab,de,tn,dn,kw OR mobileapp*:ti,ab,de,tn,dn,kw OR 'portable software app*':ti,ab,de,tn,dn,kw OR 'portablesoftware app*':ti,ab,de,tn,dn,kw OR ((mobile NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cell phone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cell phone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR (('cellphone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cellphone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR (('cellular phone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cellular phone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR (('cellularphone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cellularphone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR (('cellular telephone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cellular telephone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR (('cellulartelephone*' NEAR/2 app*):ti,ab,de,tn,dn,kw) OR (('cellulartelephone*' NEAR/2 software*):ti,ab,de,tn,dn,kw) OR ((mobile NEAR/2 (app* OR software*)):ti,ab,de,tn,dn,kw) OR 'cell phone*':ti,ab,tn,dn,de,kw OR 'cellphone*':ti,ab,tn,dn,de,kw OR 'cellular phone*':ti,ab,tn,dn,de,kw OR 'cellular telephone*':ti,ab,tn,dn,de,kw OR 'cellularphone*':ti,ab,tn,dn,de,kw OR 'cellulartelephone*':ti,ab,tn,dn,de,kw OR 'mobile phone*':ti,ab,tn,dn,de,kw OR 'mobile telephone*':ti,ab,tn,dn,de,kw OR 'mobilephone*':ti,ab,tn,dn,de,kw OR 'mobiletelephone*':ti,ab,tn,dn,de,kw OR 'smart phone*':ti,ab,tn,dn,de,kw OR 'smartphone*':ti,ab,tn,dn,de,kw) AND ('tachycardia'/exp OR 'catecholaminergic polymorphic ventricular tachycardia'/exp OR 'experimental tachycardia'/exp OR 'isoprenaline-induced tachycardia'/exp OR 'heart ventricle tachycardia'/exp OR 'hyperkinetic heart syndrome'/exp OR 'monomorphic ventricular tachycardia'/exp OR 'pacemaker mediated tachycardia'/exp OR 'paroxysmal tachycardia'/exp OR 'paroxysmal supraventricular tachycardia'/exp OR 'wolff parkinson white syndrome'/exp OR 'polymorphic ventricular tachycardia'/exp OR 'postural orthostatic tachycardia syndrome'/exp OR 'reentry tachycardia'/exp OR 'atrioventricular nodal reentry tachycardia'/exp OR 'sinoatrial nodal reentry tachycardia'/exp OR 'sinus tachycardia'/exp OR 'supraventricular tachycardia'/exp OR 'ectopic atrial tachycardia'/exp OR 'junctional ectopic tachycardia'/exp OR 'tachycardia induced cardiomyopathy'/exp OR 'acute atrial fibrillation':ti,ab,tn,dn,kw,de OR 'acute heart atrium fibrillation':ti,ab,tn,dn,kw,de OR 'atrial fibrillation':ti,ab,tn,dn,kw,de OR 'atrium fibrillation':ti,ab,tn,dn,kw,de OR 'auricular fibrilation':ti,ab,tn,dn,kw,de OR 'auricular fibrillation':ti,ab,tn,dn,kw,de OR 'cardiac atrial fibrillation':ti,ab,tn,dn,kw,de OR 'cardiac atrium fibrillation':ti,ab,tn,dn,kw,de OR 'chronic atrial fibrillation':ti,ab,tn,dn,kw,de OR 'chronic atrium fibrillation':ti,ab,tn,dn,kw,de OR 'experimental atrial fibrillation':ti,ab,tn,dn,kw,de OR 'experimentally induced atrial fibrillation':ti,ab,tn,dn,kw,de OR 'fibrillation, heart atrium':ti,ab,tn,dn,kw,de OR 'heart atrial fibrillation':ti,ab,tn,dn,kw,de OR 'heart atrium fibrillation':ti,ab,tn,dn,kw,de OR 'heart fibrillation atrium':ti,ab,tn,dn,kw,de OR 'new-onset atrial fibrillation':ti,ab,tn,dn,kw,de OR 'nonvalvular atrial fibrillation':ti,ab,tn,dn,kw,de OR 'non-valvular atrial fibrillation':ti,ab,tn,dn,kw,de OR 'paroxysmal atrial fibrillation':ti,ab,tn,dn,kw,de OR 'paroxysmal heart atrium fibrillation':ti,ab,tn,dn,kw,de OR 'permanent atrial fibrillation':ti,ab,tn,dn,kw,de OR 'permanent atrium fibrillation':ti,ab,tn,dn,kw,de OR 'persistent atrial fibrillation':ti,ab,tn,dn,kw,de OR 'persistent atrium fibrillation':ti,ab,tn,dn,kw,de OR 'persistent heart atrium fibrillation':ti,ab,tn,dn,kw,de OR 'recent-onset atrial fibrillation':ti,ab,tn,dn,kw,de OR 'atrial fibrillation'/exp OR 'chronic atrial fibrillation'/exp OR 'experimental atrial fibrillation'/exp OR 'new-onset atrial fibrillation'/exp OR 'paroxysmal atrial fibrillation'/exp OR 'permanent atrial fibrillation'/exp OR 'persistent atrial fibrillation'/exp OR (((atrial* OR atrium* OR auricular*) NEXT/2 fibrillat*):ti,ab,tn,dn,kw,de) OR 'heart atrium flutter'/exp OR 'atrial flutter':ti,ab,dn,tn,kw,de OR 'atrium flutter':ti,ab,dn,tn,kw,de OR 'atrium flutter, heart':ti,ab,dn,tn,kw,de OR 'auricular flutter':ti,ab,dn,tn,kw,de OR 'cardiac atrial flutter':ti,ab,dn,tn,kw,de OR 'cardiac atrium flutter':ti,ab,dn,tn,kw,de OR 'flutter, heart atrium':ti,ab,dn,tn,kw,de OR 'heart atrial flutter':ti,ab,dn,tn,kw,de OR 'heart atrium flutter':ti,ab,dn,tn,kw,de OR 'supraventricular flutter':ti,ab,dn,tn,kw,de OR (((atrial* OR atrium* OR auricular*) NEXT/2 flutter*):ti,ab,tn,dn,kw,de) OR 'heart ventricle flutter'/exp OR 'flutter, heart ventricle':ti,ab,dn,tn,kw,de OR 'heart ventricle flutter':ti,ab,dn,tn,kw,de OR 'ventricular flutter':ti,ab,dn,tn,kw,de OR ((ventri* NEXT/2 flutter*):ti,ab,tn,dn,kw,de) OR 'heart ventricle fibrillation'/exp OR 'cardiac ventricle fibrillation':ti,ab,tn,dn,kw,de OR 'cardiac ventricular fibrillation':ti,ab,tn,dn,kw,de OR 'fibrillation, heart ventricle':ti,ab,tn,dn,kw,de OR 'heart ventricle fibrillation':ti,ab,tn,dn,kw,de OR 'heart ventricular	781

fibrillation':ti,ab,tn,dn,kw,de OR 'ventricle fibrillation':ti,ab,tn,dn,kw,de OR 'ventricle fibrillation, heart':ti,ab,tn,dn,kw,de OR 'ventricular fibrillation':ti,ab,tn,dn,kw,de OR 'experimental ventricular fibrillation'/exp OR 'experimental ventricular fibrillation':ti,ab,tn,dn,kw,de OR 'experimentally induced ventricular vibrillation':ti,ab,tn,dn,kw,de OR 'electrically induced ventricular fibrillation'/exp OR 'electrically induced ventricular fibrillation':ti,ab,tn,dn,kw,de OR ((ventri* NEXT/2 fibrill*):ti,ab,tn,dn,kw,de) OR 'heart beat'/exp OR 'beat, heart':ti,ab,tn,dn,kw,de OR 'cardiac beat':ti,ab,tn,dn,kw,de OR 'heart beat':ti,ab,tn,dn,kw,de OR 'diastole'/exp OR 'cardiac diastole':ti,ab,tn,dn,kw,de OR 'diastole':ti,ab,tn,dn,kw,de OR 'diastolic force':ti,ab,tn,dn,kw,de OR 'heart diastole':ti,ab,tn,dn,kw,de OR 'extrasystole'/exp OR 'beat, ectopic':ti,ab,tn,dn,kw,de OR 'cardiac complexes, premature':ti,ab,tn,dn,kw,de OR 'ectopic beat':ti,ab,tn,dn,kw,de OR 'extrasystole':ti,ab,tn,dn,kw,de OR 'extrasystolic beat':ti,ab,tn,dn,kw,de OR 'heart extrasystole':ti,ab,tn,dn,kw,de OR 'heart premature beat':ti,ab,tn,dn,kw,de OR 'nodal extrasystole':ti,ab,tn,dn,kw,de OR 'premature beat':ti,ab,tn,dn,kw,de OR 'systole'/exp OR 'heart systole':ti,ab,tn,dn,kw,de OR 'systole':ti,ab,tn,dn,kw,de OR 'systolic index':ti,ab,tn,dn,kw,de OR 'systolic phase':ti,ab,tn,dn,kw,de OR ((heart NEXT/3 beat):ti,ab,tn,dn,kw,de) OR ((irregular* NEAR/3 (puls* OR heart* OR rhythm*)):ti,ab,tn,dn,kw,de) OR (((atypical* OR unexpect* OR unsuspect* OR unforeseeabl* OR abnormal* OR uneven* OR fitful* OR erratic* OR sporadi*) NEAR/3 (puls* OR heart* OR rhythm*)):ti,ab,de,tn,dn,kw))	

Table S2: Search strategy for Cochrane database

ID	Search	Hits
#1	MeSH descriptor: [Atrial Fibrillation] explode all trees	4665
#2	(atrial* near/2 fibrillation*):ti,ab,kw	12671
#3	#1 OR #2	12671
#4	MeSH descriptor: [Atrial Flutter] explode all trees	375
#5	(atrial* near/2 flutter*):ti,ab,kw	978
#6	#4 OR #5	978
#7	MeSH descriptor: [Ventricular Fibrillation] explode all trees	544
#8	(ventri* near/2 fibrillat*):ti,ab,kw	1713
#9	#7 OR #8	1713
#10	MeSH descriptor: [Tachycardia] explode all trees	1799
#11	tachycardi*:ti,ab,kw	8496
#12	#10 OR #11	8525
#13	MeSH descriptor: [Heart Rate] explode all trees	19310
#14	(heart rate):ti,ab,kw	75355
#15	#13 OR #14	75360
#16	(Irregular* or unpredictable* or atypical*) near/3 (puls* or heart* or rhythm*)	244
#17	(atypical* or unexpect* or unsuspect* or unforeseeabl* or abnormal* or uneven* or fitful* or erratic* or sporadi*) near/3 (puls* or heart* or rhythm*)	946
#18	#16 OR #17	1157
#19	((smart* near/2 phone*) or (mobil* near/2 phone*) or mobilphone* or cellphone* or (cell near/2 phone*) or mobilephone or mobile app*):ti,ab,kw	8221
#20	MeSH descriptor: [Mobile Applications] explode all trees	660
#21	MeSH descriptor: [Smartphone] explode all trees	407
#22	MeSH descriptor: [Cell Phone] explode all trees	1373
#23	#19 OR #20 OR #21 OR #22	8851
#24	MeSH descriptor: [Ventricular Flutter] explode all trees	2
#25	(ventri* near/2 flutter*):ti,ab,kw	28
#26	#24 OR #25	28
#27	#3 OR #6 OR #9 OR #12 OR #15 OR #18 OR #26	90651
#28	#23 AND #27 in Trials	370

Table S3: Summary of characteristics for conference abstracts

Study	Study design and key enrolment criteria	Setting and sample size	Population characteristics	Technology for AF detection	Reference test
Grieten 2018-1 [1]	Prospective multi-centre Age>65 years	Primary care N=242 AF prevalence 38%	Age 77 years (mean); Female 57%; hypertension 84%; diabetes 22%; stroke 23%; heart failure 29%; OAC 55%	Unspecified smartphone; Fibricheck PPG app and algorithm	Single lead ECG
Grieten 2018-2 [2]	Prospective, multi-centre	Primary care N=1056 AF prevalence 0.8%	Age 59 years (mean); Female 59%	Unspecified smartphone; Fibricheck PPG app and algorithm	Single lead ECG
Karim 2017 [3]	Prospective, single centre Sinus arrhythmia and ectopics excluded	Secondary care N=140 AF prevalence 50%		Unspecified smartphone; PPG Preventicus app and algorithm	12-lead ECG
Kuan 2018 [4]	Prospective, single centre	Secondary care N=194 AF prevalence 35%	Age 70 years (mean); Female 27%	iPhone; CRMA app 3 X 20 second recordings, AF labelled if pulse irregularity found in ≥1 PPG readings or 3 uninterpretable readings	12 lead ECG
Maitas 2012-1 [5]	Prospective, single centre AF for DCCV	Secondary care N=52 AF prevalence 100%		iPhone 4S; unknown PPG app, 120 second recordings, analysed using 2 statistical techniques (RMSSD, Shannon entropy) to examine heart beat intervals and beat-to-beat variability	12-lead ECG
Maitas 2012-2 [6]	Prospective, single centre AF for DCCV	Secondary care N=33 AF prevalence 100%		iPhone 4S; unknown PPG app, 120-300 second recordings, analysed using 3 statistical techniques (RMSSD, ShE and Sample entropy)	12-lead ECG

Mortelmans 2017 [7]	Prospective, single centre Majority with history of AF	Primary care N=242 AF prevalence 66%		Unspecified smartphone; Fibricheck PPG app, 60 second recording	Single lead ECG
Mutke 2019 [8]	Retrospective analysis of data from 2 prospective multi-centre validation trials	Unclear N=1096 AF prevalence 44%		Unspecified smartphone and PPG app; 60 second recording automated signal quality check and categorized into AF or SR using unspecified algorithm	Blinded interpretation of single lead ECG by cardiologists
Napolitano 2015 [9]	Retrospective analysis of pulse recordings from patients who underwent DCCV	Data form secondary care N=121 AF prevalence 81%		iPhone 4S; PULSESMART app, 120 second recording analysed using 3 statistical techniques RMSSD; ShE; Poincare plot	12 or 3 lead ECG
Proesmans 2019-2 [10]	Prospective, single centre AF for DCCV and in-patients with AF	Secondary care N=164 AF prevalence 37%	Age 64 years (mean); Females 42%	7 iOS and 7 android smartphones; unknown PPG app	12 lead ECG
Proesmans. 2018 [11]	Prospective, 2 centre Age over 40 years	Primary care N=1095 AF prevalence 0.5%		Unknown smartphone and PPG app; automatic algorithm and visual interpretation	Single lead ECG
Rozen 2017 [12]	Prospective, single centre AF undergoing DCCV	Secondary care N=113 AF prevalence 100%	68 years (mean); Female 23%	iPhone; CRMA PPG app, 6 recordings analysed by algorithm 2 out of 3 irregular recordings needed to label AF	Blinded 12 lead ECG or single lead ECG (rhythm strip) interpretation by 2 cardiologists
Siu 2016 [13]	Prospective, single centre Either >65 years, DM, or hypertension	Primary care N= 1027 AF prevalence 3%	Age 68 years (mean)	Unspecified smartphone; CRMA PPG app	Single lead ECG interpretation by 2 cardiologists

Smeets 2019 [14]	Prospective single centre AF scheduled for DCCV/ablation & those on continuous monitoring	Secondary care N=150 AF prevalence 37%	64 years (mean); Females 42% (AF)	6 Android and 2 iOS smartphones; unknown PPG app;1 recording per device	12-lead ECG
Vaid 2015 [15]	Prospective single centre AF undergoing DCCV	Secondary care N= 37 AF prevalence 78%	69 years (median); Female 19%	iPhone; CRMA PPG, 6 recordings analysed by CRMA algorithm 2 out of 3 irregular recordings needed to label AF	Blinded 12 lead ECG or single lead ECG (rhythm strip) interpretation by 2 cardiologists
Vandenberk 2018-1 [16]	Prospective single centre History of AF	Unclear N=344 AF prevalence 50%		Unspecified smartphone, Fibricheck PPG app, analysed by 2 blinded cardiologists	Blinded 12 lead ECG analysis by 2 cardiologists
Vandenberk 2018-2 [17]	Prospective single centre History of AF	Unclear N= 322 AF prevalence 55%		Unspecified smartphone and PPG app, 60 second recording analysed by clinicians	Blinded single lead ECG interpretation by 2 cardiologists
Yan 2016 [18]	Prospective single centre	Secondary N=85 AF prevalence 29%	Age 72 years (mean); Female 33%	iPhone 6s, CRMA PPG app, 3 X 20 second recordings, irregularity in 1 or more recordings needed to label AF	12 lead ECG

Table S4: Risk of bias and applicability concerns for full text studies

Study author and year	QUADAS 2-Risk of Bias				QUADAS 2-Applicability concerns			
	Patient selection	Index test: PPG	Reference standard: ECG	Flow and timing	Patient Selection	Index test: PPG	Reference standard: ECG	Domains with high risk
Brasier 2019 [19]	High risk	Unclear	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Chan 2016 [20]	Unclear	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	1/7
Fan 2019 [21]	High risk	Unclear	Low risk	High risk	Low risk	Low risk	Low risk	2/7
McManus 2016 [22]	High risk	Low risk	Unclear	High risk	Low risk	Low risk	Low risk	2/7
McManus 2013 [23]	High risk	High risk	Unclear	Low risk	Low risk	Low risk	Low risk	2/7
Mutke 2020 [24]	High risk	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Poh 2018 [25]	Unclear	Low risk	High risk	High risk	Unclear	Low risk	Low risk	2/7
Proesmans 2019-1 [26]	High risk	Unclear	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Rozen 2018 [27]	High risk	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Yan 2018 [28]	High risk	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	2/7

Table S5: Risk of bias and applicability concerns for conference abstracts

Study author and year	QUADAS 2-Risk of Bias				QUADAS 2-Applicability concerns			
	Patient selection	Index test: PPG	Reference standard: ECG	Flow and timing	Patient Selection	Index test: PPG	Reference standard: ECG	Domains with high risk
Grieten 2018-1 [1]	High risk	Unclear	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Grieten 2018-2 [2]	High risk	Unclear	High risk	High risk	Low risk	Low risk	Low risk	3/7
Karim 2017 [3]	High risk	Unclear	Unclear	Unclear	Low risk	Low risk	Low risk	1/7
Kuan 2018 [4]	Unclear	Unclear	Unclear	Unclear	Unclear	Low risk	Low risk	0/7
Maitas 2012-1 [5]	High risk	Unclear	Unclear	Unclear	Low risk	Low risk	Low risk	1/7
Maitas 2012-2 [6]	High risk	Unclear	Unclear	Unclear	Low risk	Low risk	Low risk	1/7
Mortelmans 2017 [7]	High risk	Unclear	High risk	High risk	Low risk	Low risk	Low risk	3/7
Mutke 2019 [8]	Unclear	Unclear	Low risk	Low risk	Low risk	Low risk	Low risk	0/7
Napolitano 2015 [9]	High risk	Unclear	Unclear	High risk	Low risk	Low risk	Low risk	2/7
Proesmans 2019-2 [10]	Unclear	Unclear	High risk	Unclear	Unclear	Low risk	Low risk	1/7
Proesmans 2018 [11]	High risk	Unclear	Unclear	High risk	Low risk	Low risk	Low risk	2/7
Rozen 2017 [12]	High risk	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Siu 2016 [13]	Unclear	Unclear	Unclear	Unclear	Low risk	Low risk	Low risk	0/7
Smeets. 2019 [14]	Unclear	Unclear	Unclear	High risk	Low risk	Low risk	Low risk	1/7
Vaid 2015 [15]	High risk	Low risk	Low risk	High risk	Low risk	Low risk	Low risk	2/7
Vandenberk 2018-1 [16]	High risk	Unclear	Unclear	Unclear	Low risk	Low risk	Low risk	1/7
Vandenberk 2018-2 [17]	Unclear	Unclear	Low risk	Unclear	Low risk	Low risk	Low risk	0/7
Yan 2016 [18]	Unclear	Low risk	Unclear	Unclear	Low risk	Low risk	Low risk	0/7

Table S6: Sensitivity and specificity of each study by smartphone PPG application

Application	Study	Sensitivity % (95% CI)	Specificity (95% CI)
Cardiio Rhythm	Chan 2016 [20]	93 (77-99)	98 (97-99)
	Rozen 2018 [27]	93 (87-97)	91 (83– 96)
	Yan 2018a [28]	95 (87-98)	96 (91-98)
	Yan 2018b [28]	95 (87-98)	93 (88-96)
	Kuan 2018 [4]	100 (83-100)	95 (84-99)
	Rozen 2017 [12]	96 (90-99)	93 (87-97)
	Siu 2016 [13]	93	98
	Vaid 2015 [15]	97 (82-100)	85 (69-94)
	Yan 2016 [18]	93 (77-98)	95 (86-98)
Preventicus	Brasier 2019a [19]	90 (86-93)	99 (98-100)
	Brasier 2019b [19]	91 (87-95)	99 (97-100)
	Brasier 2019c [19]	92 (86-95)	100 (98-100)
	Fan 2019 [21]	95 (92-97)	100 (98-100)
	Karim 2017 [3]	94 (85-98)	96 (87-99)
	Mutke 2020 [24]	92 (89-94)	98 (97-99)
Fibricheck	Proesmans 2019-1 [26]	96 (89-99)	97 (91-99)
	Grieten 2018-1 [1]	98 (92-100)	88 (80-94)
	Grieten 2018-2 [2]	100	97
	Mortelmans 2017 [7]	98 (92-100)	88 (80-94)
	Vandenberk 2018-1[16]	97	99
PULSE-SMART	McManus 2016 [22]	97	94
	Napolitano 2015 [9]	97	94

Figure S1: Forest plot of the sensitivity and specificity of smartphone PPG vs ECG

Horizontal lines represent the 95% confidence interval (where available) for each **comparison.**

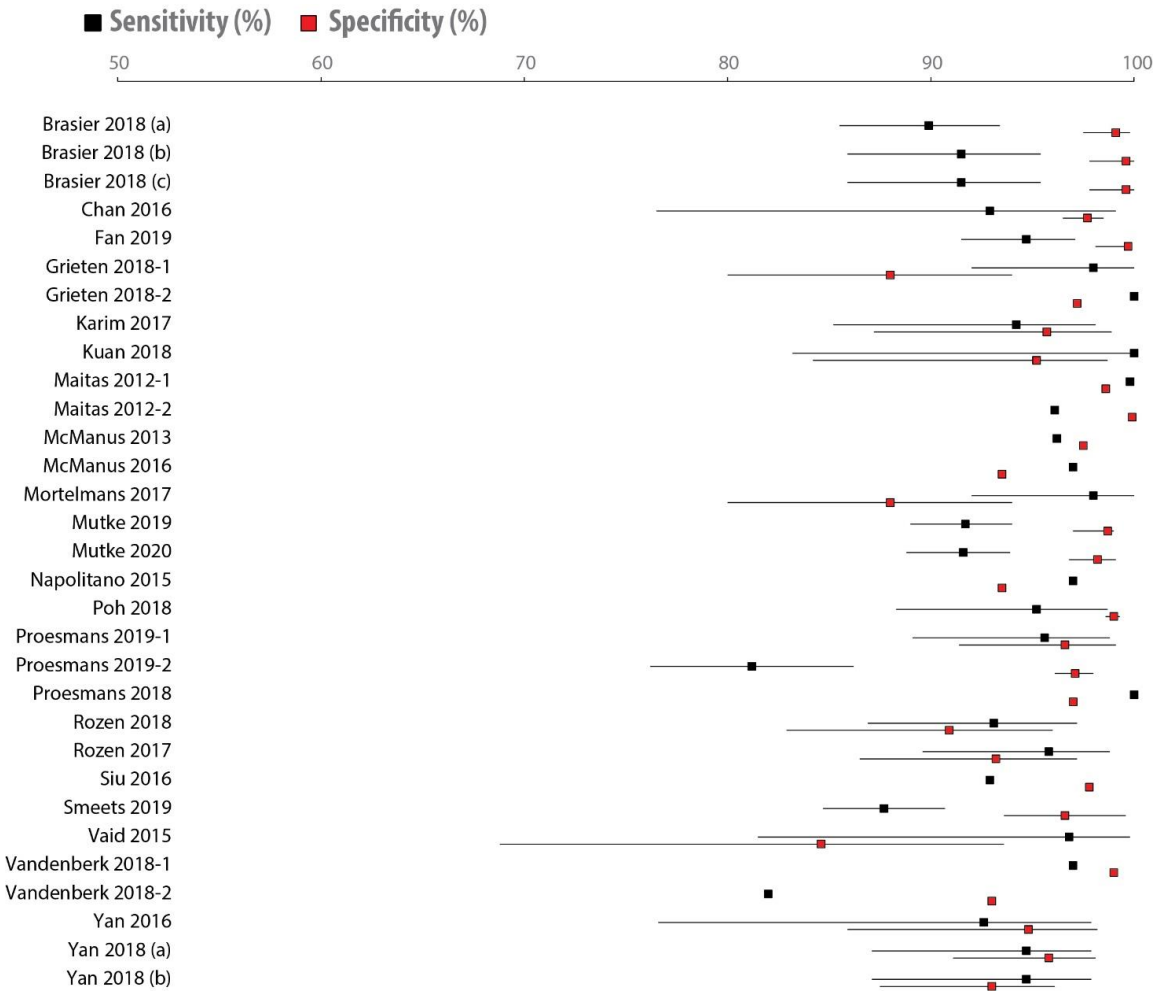
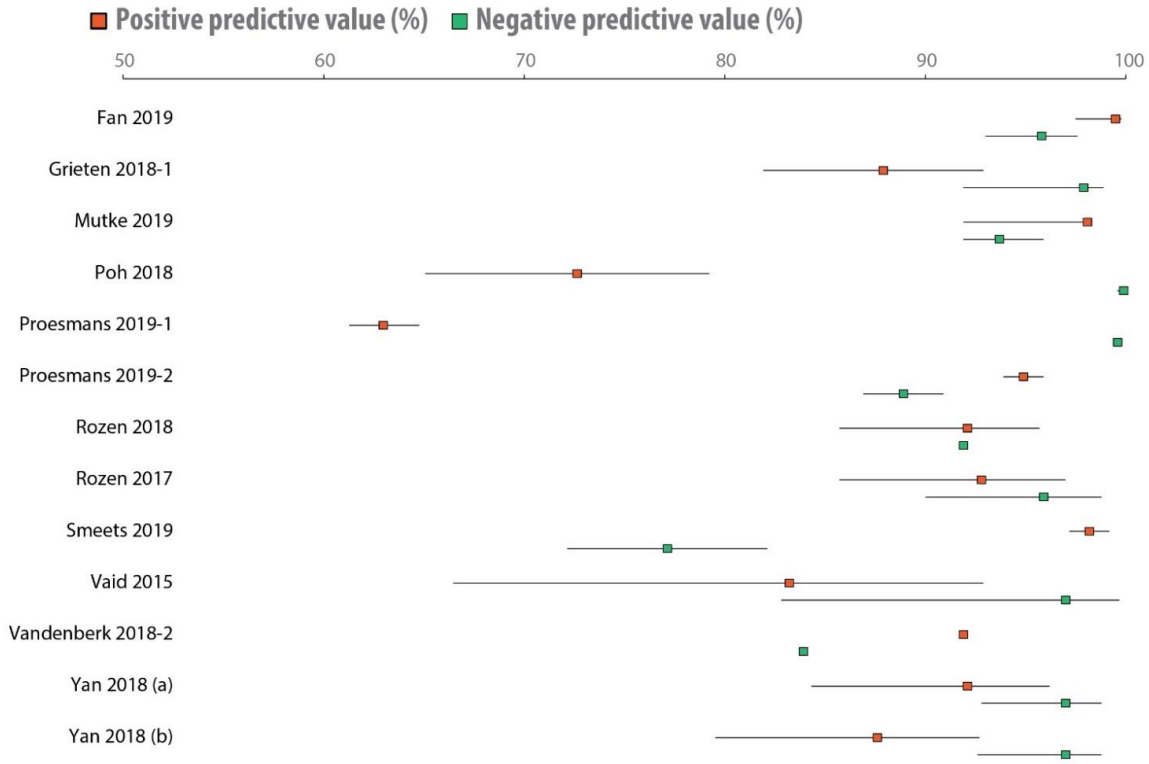


Figure S2: Forest plot of positive/negative prediction for smartphone PPG vs ECG

Horizontal lines represent the 95% confidence interval (where available) for each comparison



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