

1 **Exclusion tests in Unilateral Primary Aldosteronism**
2 **(EU-PA) Study**

3 **Subtitle: A systematic review and meta-analysis**

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52 **Supplemental Literature Search**

53 Using terms and boolean operators in combination, we conducted a systematic search of relevant articles
54 from PubMed, EMBASE, Web of Science, and Cochrane Library databases on the diagnostic
55 performance of the screening and exclusion tests of human PA published from January 1st, 1970 to
56 December 31st, 2021. The references of published articles were also screened to identify additional
57 relevant studies.

58

59 **PubMed**

60 Search: (((("Hyperaldosteronism"[Mesh]) OR (((((entry terms: Aldosteronism[Title/Abstract]) OR
61 (Conn Syndrome[Title/Abstract])) OR (Syndrome, Conn[Title/Abstract])) OR (Primary
62 Hyperaldosteronism[Title/Abstract])) OR (Hyperaldosteronism, Primary[Title/Abstract])) OR (Conn's
63 Syndrome[Title/Abstract * [Title/Abstract]]) OR predictive value of tests[MeSH Term] OR
64 accuracy*[Title/Abstract]))) AND ("1970/01/01"[Date - Publication] : "2021/12/31"[Date - Publication]))

65 Filters: English

66 Items found: 852

67

68 **EMBASE**

No.	Query	Results
#1	'hyperaldosteronism'/exp	15678
#2	'aldosteronism':ab,ti OR 'conn syndrome':ab,ti OR 'syndrome, conn':ab,ti OR 'primary hyperaldosteronism':ab,ti OR 'hyperaldosteronism, primary':ab,ti OR 'conns syndrome':ab,ti	8025
#3	#1 OR #2	16542
#4	'sensitivity and specificity'/exp	418850
#5	'predictive value'/exp	207949
#6	'sensitiv*':ab,ti OR 'accuracy*':ab,ti	2361143
#7	#4 OR #5 OR #6	2583822
#8	#3 AND #7	1635
#9	#3 AND #7 AND [english]/lim AND [1970-2021]/py	1480
#10	#3 AND #7 AND [english]/lim AND [1970-2021]/py AND [humans]/lim	1303

Items found: 1303

69

70 **Web of Science**

# 1	TS= (Hyperaldosteronism or Aldosteronism or Conn Syndrome or Syndrome, Conn or Primary Hyperaldosteronism or Hyperaldosteronism, Primary or Conn's Syndrome or Conns Syndrome or Syndrome, Conn's) Indexes= A&HCI, BKCI-SSH, BKCI-S, CCR- EXPANDED, ESCI, IC, CPCI-SSH, CPCI-S, SCI-EXPANDED	7109
# 2	TS= ((sensitivity and specificity) or predictive value of test or (predictive and value*) or sensitiv* or accuracy*) Indexes= A&HCI, BKCI-SSH, BKCI-S, CCR- EXPANDED, ESCI, IC, CPCI-SSH, CPCI-S, SCI-EXPANDED	3820274
# 3	#1 AND #2 Indexes= A&HCI, BKCI-SSH, BKCI-S, CCR-	854

	EXPANDED, ESCI, IC, CPCI-SSH, CPCI-S, SCI-EXPANDED	
# 4	#3 Indexes= A&HCI, BKCI-SSH, BKCI-S, CCR- EXPANDED, ESCI, IC, CPCI-SSH, CPCI-S, SCI-EXPANDED Timespan=1970-01-01 to 2021-12-31	850
# 5	#5 AND #1 Refined by: LANGUAGES: (ENGLISH) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=1970-01-01 to 2021-12-31	818

Items found: 818

71

72 Cochrane Library

ID	Search	Hits
#1	MeSH descriptor: [Hyperaldosteronism] explode all trees	67
#2	(Aldosteronism):ti,ab,kw OR (Conn Syndrome):ti,ab,kw OR (Syndrome, Conn):ti,ab,kw OR (Primary Hyperaldosteronism):ti,ab,kw OR (Hyperaldosteronism, Primary):ti,ab,kw OR (Conn's Syndrome):ti,ab,kw OR (Conns Syndrome):ti,ab,kw OR (Syndrome, Conn's):ti,ab,kw	157
#3	#1 OR #2	177
#4	MeSH descriptor: [Sensitivity and Specificity] explode all trees	15311
#5	MeSH descriptor: [Predictive Value of Tests] explode all trees	6937
#6	(sensitiv*):ti,ab,kw OR (accuracy*):ti,ab,kw	86299
#7	#4 OR #5 OR #6	91652
#8	#3 AND #7	37
#9	#3 AND #7 with Publication Year from 1970 to 2021, in Trials	37

Items found: 37

73

74 The final literature search was performed on 9th Februry 2021 (all database, by RZ)

75

76 **Total items found: 3010**

77 **Table S1.** Quantitative Scoring Method for the Assessment of Bias Risk

Domain	Item	Score
Study design & patient selection	1. Were the patients enrolled consecutively or randomly, or not?	[0 1 2 3 4 5 6 7 8 9] 10
	2. Were the patients pre-selected? e.g. patients with positive and negative ARR, or patients with positive ARR?	[0 1 2 3 4 5 6 7 8 9] 10
Index test	3. Were the cut-off values of ARR, and/or exclusion tests, pre-specified?	[0 1 2 3 4 5 6 7 8 9] 10
	4. Were the results interpreted with no knowledge of the final diagnosis?	[0 1 2 3 4 5 6 7 8 9] 10
Reference standard	5. Was the reference standard used to classify uPA appropriately used?	[0 1 2 3 4 5 6 7 8 9] 10
	6. Were the results interpreted with no knowledge of the index test?	[0 1 2 3 4 5 6 7 8 9] 10
Flow & timing	7. Did all patients receive the reference standard?	[0 1 2 3 4 5 6 7 8 9] 10
	8. Did all patients receive the same reference standard?	[0 1 2 3 4 5 6 7 8 9] 10
	9. Were some patients excluded from the analysis?	[0 1 2 3 4 5 6 7 8 9] 10
	Total	

78 ARR, aldosterone-to-renin ratio; uPA, unilateral primary aldosteronism.

79 **Table S2.** Excluded studies and criteria for exclusion

Study	Exclusion criteria
Adilijiang, M., 2021(1)	Insufficient data to construct a 2x2 table based on uPA
Ahmed, A., 2014(2)	Duplicate data
Arteaga, E., 1985(3)	Exclusion test for PA subtyping
Berge, C., 2015(4)	Wrong calculation of plasma renin concentration
Burrello, J., 2020(5)	Duplicate data
Castro, O. L., 2002(6)	Insufficient data to construct a 2x2 table based on uPA
Fukumoto, T., 2021(7)	Exclusion test for PA subtyping
Gan, W. J., 2019(8)	Insufficient data to construct a 2x2 table based on uPA
Guo, Z., 2018(9)	Duplicate data
Hashimura, H., 2018(10)	Exclusion test for PA subtyping
Jansen, P. 2014(11)	Insufficient data to construct a 2x2 table based on uPA
Juutilainen, A. M., 2005(12)	Case-control study
Kater, C. E., 2004(13)	Case-control study
Kawashima, J., 2020(14)	Insufficient data to construct a 2x2 table based on uPA
Kidoguchi, S., 2019(15)	Insufficient data to construct a 2x2 table based on uPA
Kline, G. A., 2014(16)	Insufficient data to construct a 2x2 table based on uPA
Kuo, C. C., 2015(17)	Duplicate data
Li, T. Q., 2019(18)	Insufficient data to construct a 2x2 table based on uPA
Li, Y. Y., 2016(19)	Duplicate data
Lin, C., 2020(20)	Duplicate data
Lyons, D. F., 1983(21)	Case-control study
Ma, L. Q., 2018(22)	Duplicate data
Mantero, F., 1990(23)	Exclusion test for PA subtyping
Montori, V. M., 2001(24)	Insufficient data to construct a 2x2 table based on uPA
Muratani, H., 1987(25)	Case-control study
Myśliwiec, J., 2012(26)	Insufficient data to construct a 2x2 table based on uPA
Nagano, H., 2020(27)	Exclusion test for PA subtyping
Nanba, K., 2012(28)	Exclusion test for PA subtyping
Naomi, S., 1987(29)	Case-control study
Pilz, S., 2019(30)	Insufficient data to construct a 2x2 table based on uPA
Rossi, E., 2002(31)	Case-control study
Rossi, G. P., 2007(32)	Duplicate data
Schirpenbach, C., 2006(33)	Case-control study
Streeten, D. H., 1982(34)	Insufficient data to construct a 2x2 table based on uPA
Sun, F., 2021(35)	Exclusion test for PA subtyping
Tamura, N., 2020(36)	Insufficient data to construct a 2x2 table based on uPA
Thuzar, M., 2020(37)	Duplicate data
Wang, K. R., 2020(38)	Insufficient data to construct a 2x2 table based on uPA
Yamashita, K., 2020(39)	Exclusion test for PA subtyping
Zhu, K. Y., 2019(40)	Insufficient data to construct a 2x2 table based on uPA

80 PA, primary aldosteronism; uPA, unilateral primary aldosteronism.

81 **Table S3.** Quantitative Scoring for the Quality of Each Single Study

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
ARR									
Bernini 2008	7	8	4	5	6	5	3	3	6
Burrello 2016	6	4	10	5	4	4	4	4	5
Ducher 2012	8	4	8	8	5	3	5	7	6
Fries 2020	9	6	2	6	4	2	3	3	4
Giacchetti 2006	3	4	4	5	3	3	3	3	5
Maiolino 2017a	10	9	9	10	9	7	5	7	6
Maiolino 2017b	10	9	9	10	9	7	5	7	6
Okamoto 2018	9	2	10	5	6	5	4	6	3
Vorselaars 2018	9	7	6	6	1	2	5	2	6
Weickert 2009	2	3	1	5	6	2	2	2	5
CCT									
Kim 2016	5	2	9	5	1	5	4	4	8
Maiolino 2017 ^a	10	10	9	10	10	9	5	7	6
Maiolino 2017 ^b	10	10	9	10	10	9	5	7	6
Meng 2018	3	6	9	7	7	8	3	5	9
Okamoto 2019	9	2	10	5	6	5	4	6	3
Rossi 2007	10	10	9	8	8	9	6	7	7
Song 2018	6	3	8	6	4	7	5	5	7
Wu 2009	7	4	9	7	6	5	3	4	8
Wu 2010	8	4	10	7	8	5	4	3	8
SIT									
Fries 2020	9	6	2	6	4	2	3	3	4

Fuss 2021	7	8	4	5	6	5	3	3	6
Meng 2017	3	6	9	6	7	8	3	5	9
Mulatero 2006	5	2	9	5	2	6	2	2	8
Okamoto 2019	9	2	10	5	6	5	4	6	3
Rossi 2007	10	9	8	9	9	9	7	8	7
Song 2017	6	3	8	6	4	7	5	5	7
Stowasser 2018	4	3	9	7	8	7	5	5	5
Vivien 2019	6	6	8	7	7	5	5	4	5
Zhang 2020	3	5	6	7	2	1	1	1	1
FST									
Okamoto 2019	9	2	10	5	6	5	4	6	3
FUT									
Stowasser 2018	4	3	9	7	8	7	5	5	5

82 ARR, aldosterone-to-renin ratio; CCT, captopril challenge test; SIT, saline infusion test; FST, fludrocortisone suppression test; FUT, furosemide upright test. a and b represent
 83 the exploratory and the validation cohort in Maiolino's study, respectively.

Table S4. Additional Patients' Characteristics

	Setting	Study Design	Wash-out period	Serum K⁺ (mEq/L)	Potassium supplement	Salt intake
Bernini 2008	Single referral center	Retrospective	4w diuretics, 3w others	3.2 (uPA)	Yes	Restricted
Burrello 2016	Single referral center	Prospective	Partly done, 20%	3.6 (PA)	Yes	Liberal
Ducher 2012	Multiple referral centers	Prospective	4w MRA, 2w others, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Liberal
Fries 2020	Multiple referral centers	Prospective	4w MRA/diuretics, 2w others, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Liberal
Fuss 2021	Single referral center	Prospective	4w MRA, > 1w others, only maintain CCB and/or a-blocker	3.7 (uPA)	Yes	Liberal
Giacchetti 2006	Single referral center	Prospective	4w discontinued, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Restricted
Kim 2016	Single referral center	Prospective	6w MRA, 4w others, only maintain CCB and/or a-blocker	3.2 (uPA)	Yes	Liberal
Maiolino 2017 ^a	Multiple referral centers	Prospective	6w MRA, 2w others, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Restricted
Maiolino 2017 ^b	Single referral center	Prospective	4w discontinued, only maintain CCB and/or a-blocker	3.3 (uPA)	Yes	Restricted
Meng 2018	Single referral center	Retrospective	6w MRA, 4w diuretics, 2w others, only maintain CCB and/or a-blocker	2.9 (uPA)	Yes	Liberal
Mulatero 2006	Multiple referral centers	Prospective	8w MRA, 6w diuretic, 3w others, only maintain CCB and/or a-blocker	3.7 (PA)	Yes	Liberal

Okamoto 2019	Single referral center	Prospective	Only maintain CCB and/or a-blocker	3.3 (uPA)	N.A.	Restricted
Rossi 2007	Multiple referral centers	Prospective	6w MRA, 2w others, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Restricted
Song 2018	Single referral center	Prospective	4w MRA, 2w others, only maintain CCB and/or a-blocker	3.2 (PA)	Yes	Restricted
Stowasser 2018	Single referral center	Prospective	6w MRA, 2w others, only maintain CCB and/or a-blocker	3.7 (PA)	N.A.	Liberal
Vivien 2019	Single referral center	Retrospective	6w MRA, 4w diuretics, 2w others, only maintain CCB and/or a-blocker	N.A.	Yes	Liberal
Vorselaars 2018	Single referral center	Prospective	≥ 2w discontinued, only maintain CCB and/or a-blocker	N.A.	Yes	Restricted
Weickert 2009	Single referral center	Prospective	≥ 2w discontinued, only maintain CCB and/or a-blocker	3.3 (uPA)	N.A.	Restricted
Wu 2009	Multiple referral centers	Prospective	2w discontinued, only maintain CCB and/or a-blocker	3.4 (uPA)	Yes	Restricted
Wu 2010	Single referral center	Prospective	3w discontinued, only maintain CCB and/or a-blocker	3.7 (uPA)	Yes	Restricted
Zhang 2020	Single referral center	Prospective	4w MRA/diuretics, 2w others, only maintain CCB and/or a-blocker	4.0 (uPA)	Yes	Liberal

85 CCB, calcium channel blocker; MRA, mineralocorticoid receptor antagonist; N.A., not available; PA, primary aldosteronism; uPA, unilateral primary aldosteronism. a and b
 86 represent the exploratory and the validation cohort in Maiolino's study, respectively.

87 **Table S5.** Meta-regression of the Aldosterone-to-renin Ratio

(1)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	9/1	-0.005	2.151	0.998	1.00 (0.00 - 390.56)
Population (suspected PA or positive ARR)	7/3	-2.357	1.829	0.267	0.09 (0.00 - 15.20)
Cutoff (chosen by ROC or not)	5/5	0.898	1.229	0.506	2.45 (0.08 - 74.50)
Reference (golden or gold)	5/5	0.010	1.299	0.994	1.01 (0.03 - 37.21)
(2)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	7/3	-2.369	1.249	0.116	0.09 (0.00 - 2.32)
Cutoff (chosen by ROC or not)	5/5	0.882	1.014	0.425	2.41 (0.18 - 32.76)
Reference (golden or gold)	5/5	0.069	1.185	0.956	1.07 (0.05 - 22.55)
(3)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	7/3	-2.275	0.827	0.033	0.10 (0.01 - 0.78)
Cutoff (chosen by ROC or not)	5/5	0.868	0.972	0.406	2.38 (0.22 - 25.66)
(4)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	7/3	-2.209	0.766	0.024	0.11 (0.02 - 0.67)
(5)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Cutoff (chosen by ROC or not)	5/5	0.722	1.217	0.572	2.06 (0.12 - 36.62)

88 ARR, aldosterone-to-renin ratio; CI, confidence interval; No., number of studies; PA, primary
 89 aldosteronism; RDOR, relative diagnostic odds ratio; ROC, receiving operation characteristic curve;
 90 Std. Err., standard error.

91 **Table S6.** Meta-regression of the Captopril Challenge Test

(1)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	3/6	-0.151	1.979	0.946	0.86 (0.00 - 4293.95)
Population (suspected PA or positive ARR)	3/6	-0.863	1.591	0.642	0.42 (0.00 - 397.11)
Cutoff (chosen by ROC or not)	2/7	-0.537	2.193	0.829	0.58 (0.00 - 7310.15)
Reference (golden or gold)	3/6	-0.089	1.556	0.960	0.92 (0.00 - 739.01)
Readout variable (ARR or PAC)	6/3	2.405	1.601	0.272	11.07 (0.01 - 10841.02)
(2)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	3/6	-0.217	1.103	0.857	0.80 (0.02 - 26.95)
Population (suspected PA or positive ARR)	3/6	-0.912	1.181	0.496	0.40 (0.01 - 17.21)
Cutoff (chosen by ROC or not)	2/7	-0.506	1.815	0.799	0.60 (0.00 - 194.43)
Readout variable (ARR or PAC)	6/3	2.439	1.283	0.153	11.46 (0.19 - 678.66)
(3)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	3/6	-0.756	0.751	0.371	0.47 (0.06 - 3.78)
Cutoff (chosen by ROC or not)	2/7	-0.676	1.482	0.672	0.51 (0.01 - 31.18)
Readout variable (ARR or PAC)	6/3	2.430	1.186	0.110	11.36 (0.42 - 305.70)
(4)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	3/6	-0.911	0.631	0.208	0.4 (0.08 - 2.04)
Readout variable (ARR or PAC)	6/3	2.037	0.771	0.046	7.67 (1.06 - 55.66)
(5)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Readout variable (ARR or PAC)	6/3	2.283	0.779	0.026	9.81 (1.46 - 65.93)
(6)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	3/6	-1.253	0.801	0.169	0.29 (0.04 - 2.03)

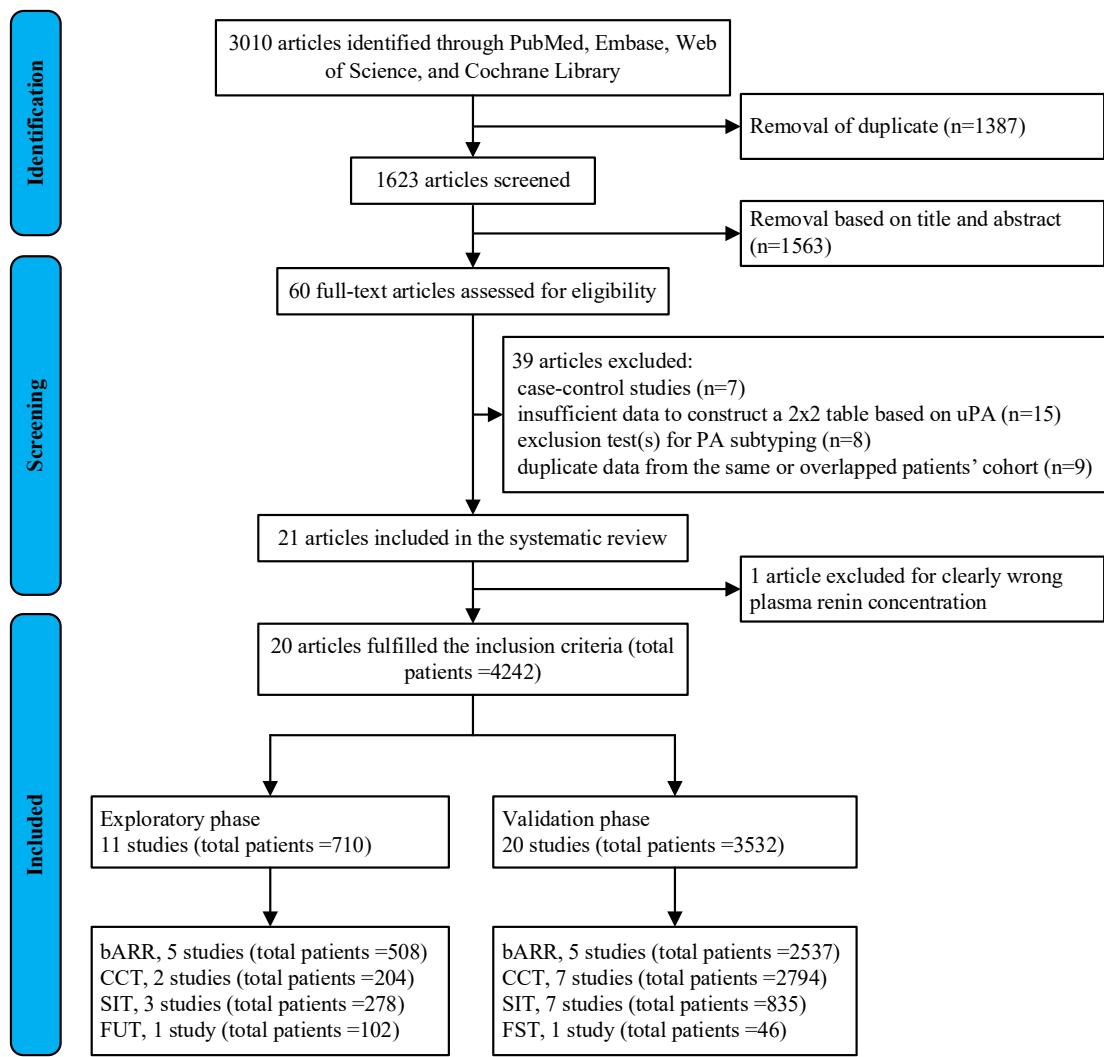
92 ARR, aldosterone-to-renin ratio; CI, confidence interval; No., number of studies; PA, primary
 93 aldosteronism; PAC, plasma aldosterone concentration; RDOR, relative diagnostic odds ratio; ROC,
 94 receiving operation characteristic curve; Std. Err., standard error.

95 **Table S7.** Meta-regression of the Saline Infusion Test

(1)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	6/4	0.647	0.910	0.528	1.91 (0.11 - 34.63)
Population (suspected PA or pos ARR)	3/7	1.349	1.606	0.463	3.85 (0.02 - 639.78)
Cutoff (chosen by ROC or not)	5/5	-0.205	1.429	0.895	0.81 (0.01 - 76.98)
Reference (golden or gold)	3/7	-0.207	1.286	0.883	0.81 (0.01 - 48.75)
Position (seated or recumbent)	5/5	1.459	0.966	0.228	4.30 (0.20 - 93.05)
(2)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	6/4	0.770	0.761	0.369	2.16 (0.26 - 17.84)
Population (suspected PA or positive ARR)	3/7	1.180	1.004	0.305	3.26 (0.20 - 52.88)
Reference (golden or gold)	3/7	-0.190	1.113	0.872	0.83 (0.04 - 18.16)
Position (seated or recumbent)	5/5	1.444	0.723	0.116	4.24 (0.57 - 31.56)
(3)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Continent (Europe or Asia)	6/4	0.904	0.645	0.220	2.47 (0.47 - 12.96)
Population (suspected PA or positive ARR)	3/7	1.048	0.632	0.158	2.85 (0.56 - 14.48)
Position (seated or recumbent)	5/5	1.456	0.573	0.052	4.29 (0.98 - 18.72)
(4)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	3/7	1.276	0.743	0.137	3.58 (0.58 - 22.05)
Position (seated or recumbent)	5/5	1.440	0.725	0.094	4.22 (0.72 - 24.88)
(5)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Position (seated or recumbent)	5/5	1.082	0.845	0.241	2.95 (0.40 - 21.77)
(6)					
Variable	No.	Coefficient	Std. Err.	p value	RDOR (95% CI)
Population (suspected PA or positive ARR)	3/7	0.837	0.918	0.392	2.31 (0.26 - 20.22)

96 ARR, aldosterone-to-renin ratio; CI, confidence interval; No., number of studies; PA, primary
 97 aldosteronism; RDOR, relative diagnostic odds ratio; ROC, receiving operation characteristic curve;
 98 Std. Err., standard error.

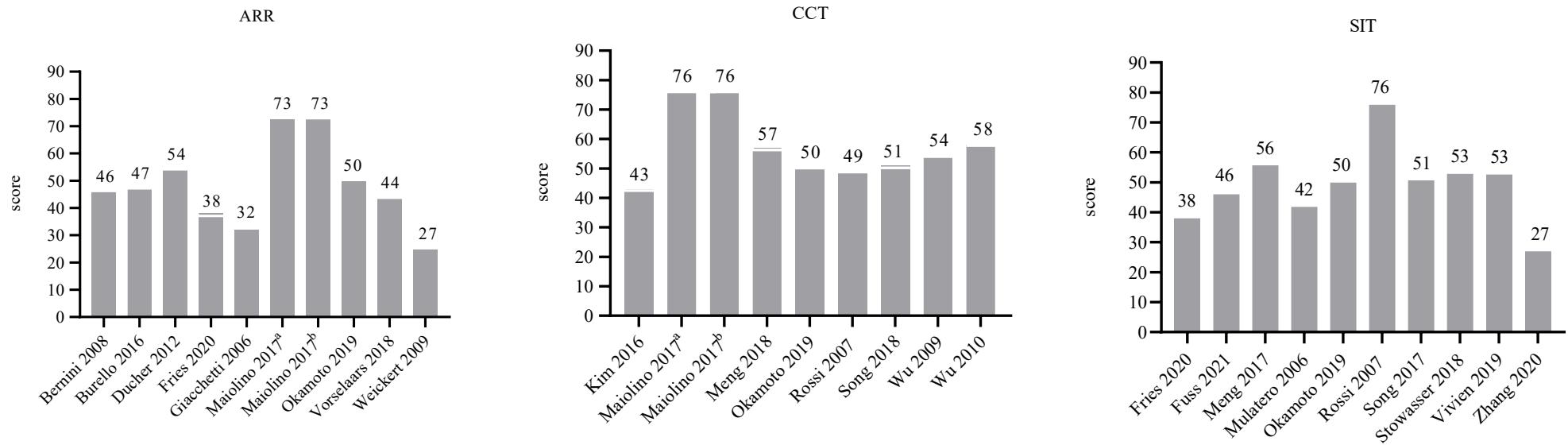
99 **Figure S1.** PRISMA Flow Chart



100

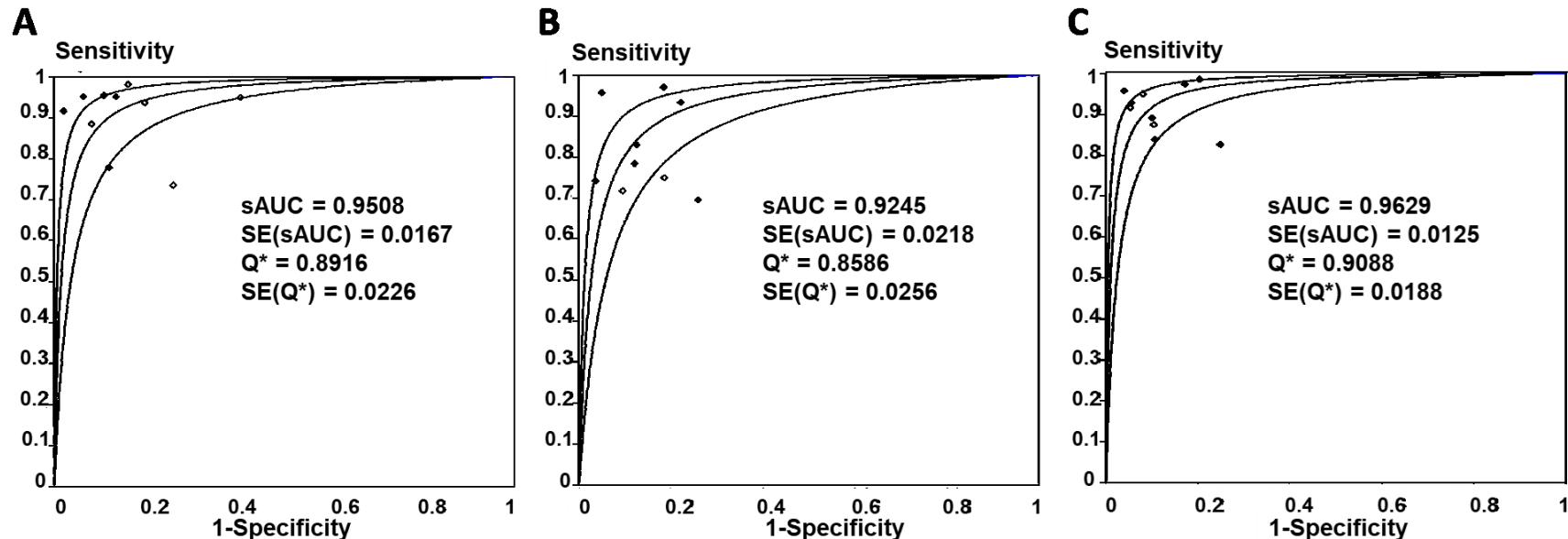
101 ARR, aldosterone-to-renin ratio; CCT, captopril challenge test; FST, fludrocortisone suppression test;
 102 FUT, furosemide upright test; PA, primary aldosteronism; PRISMA, The Preferred Reporting Items for
 103 Systematic Reviews and Meta-Analyses; SIT, saline infusion test; uPA, unilateral primary aldosteronism.
 104 The exploratory and the validation phase indicate studies using the golden and gold standard for the
 105 diagnosis of uPA, respectively.

106 **Figure S2.** Mean Average of Quantitative Scoring of the ARR, CCT, and SIT



107 ARR, aldosterone-to-renin ratio; CCT, captopril challenge test; SIT, saline infusion test. a and b represent the exploratory and the validation cohort in Maiolino's study,
108 respectively.

109 **Figure S3.** Summary Area under the Operating Characteristic Curve of the ARR, CCT, and SIT

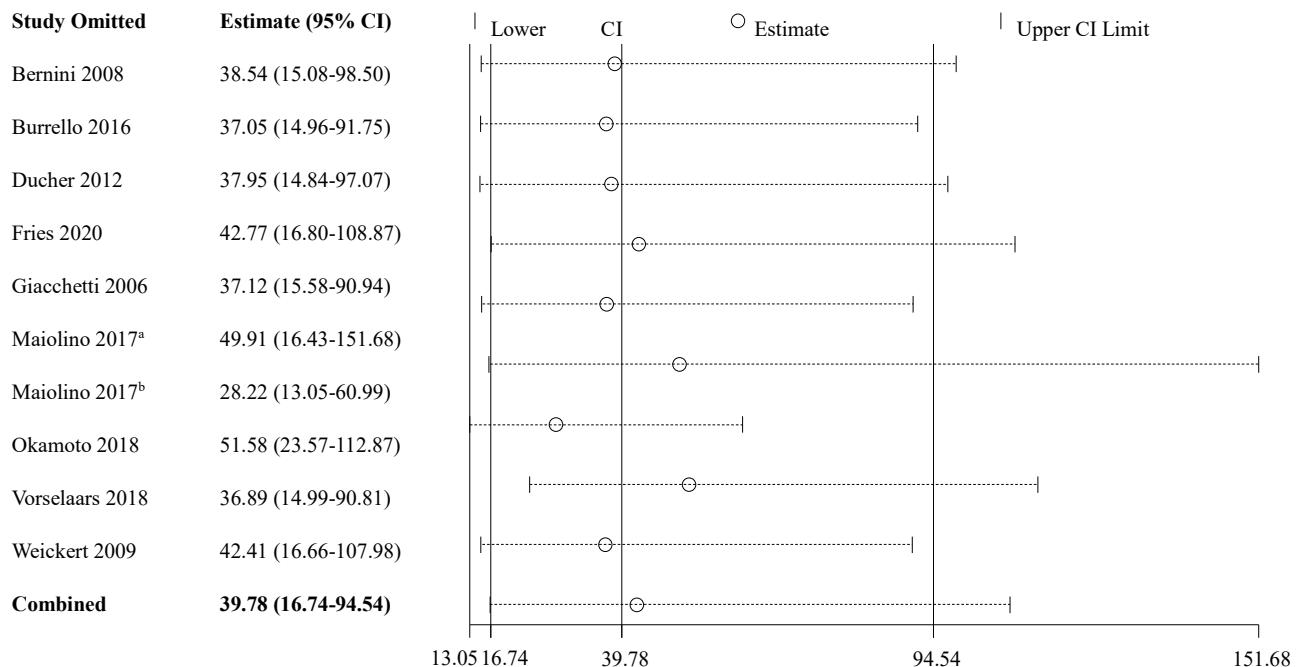


110

111 ARR, aldosterone-to-renin ratios; CCT, captopril challenge test; SIT, saline infusion test. Solid diamond: study by the gold standard; empty diamond: study by the golden
112 standard.

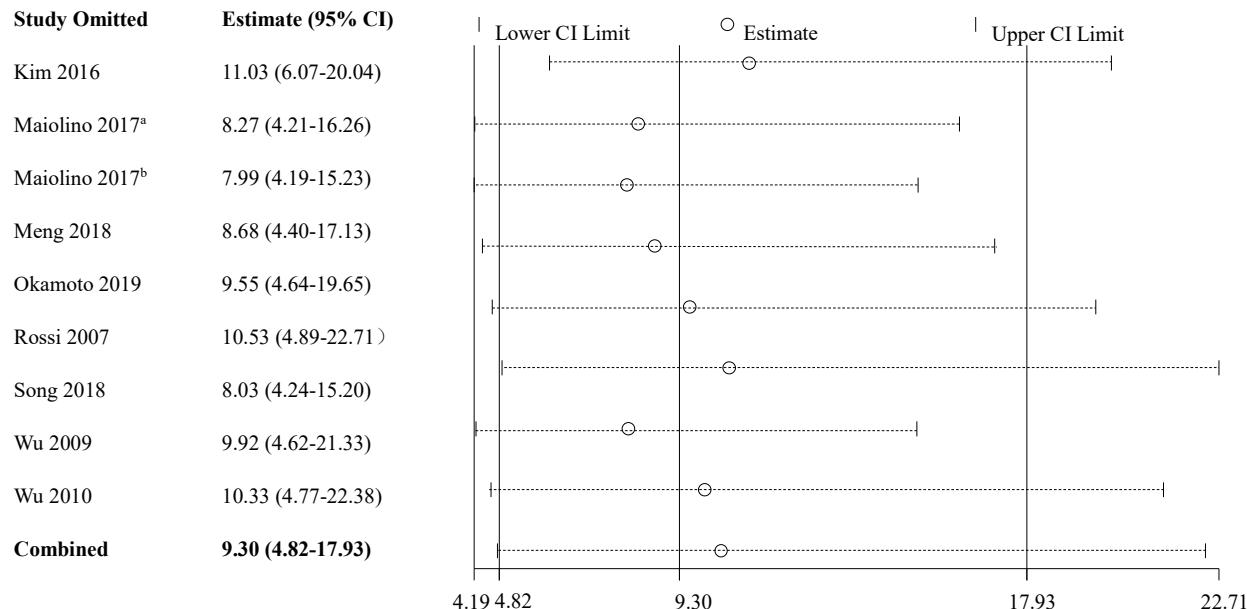
113

114 **Figure S4.** Sensitivity Analysis of the Aldosterone-to-renin Ratio



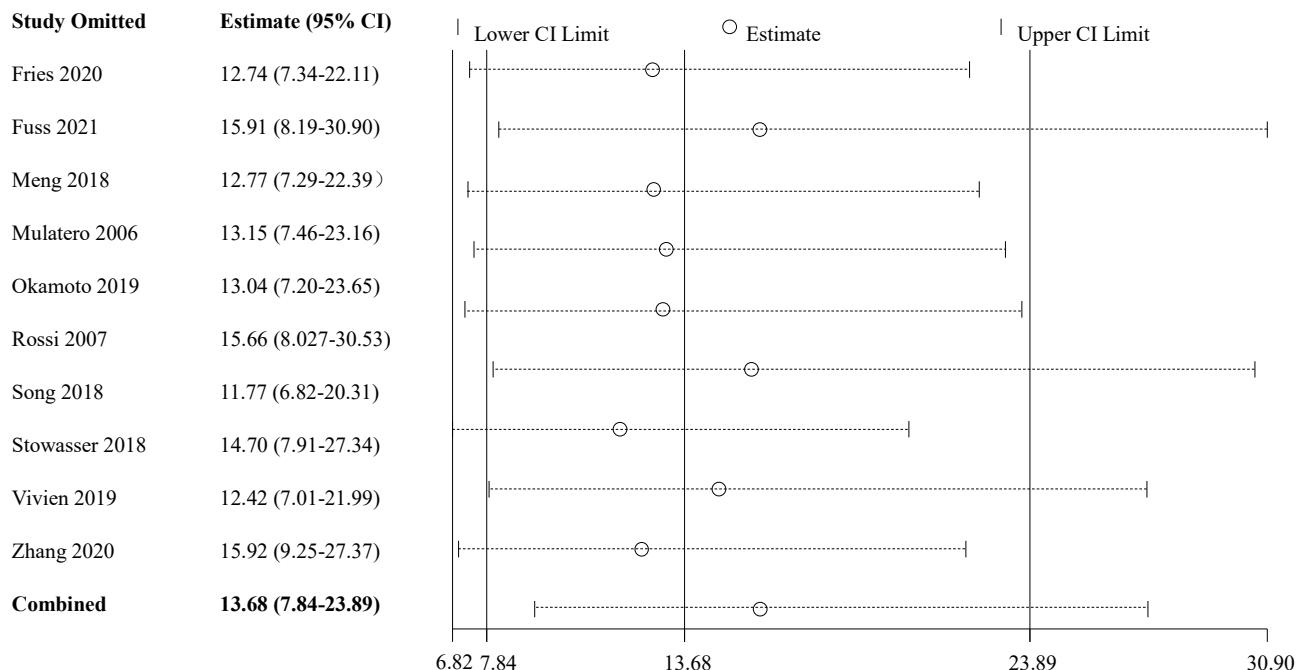
115 Meta-analysis estimates, given named study is omitted. a and b represent the exploratory and the validation cohort in Maiolino's study, respectively.

116 **Figure S5.** Sensitivity Analysis of the Captopril Challenge Test

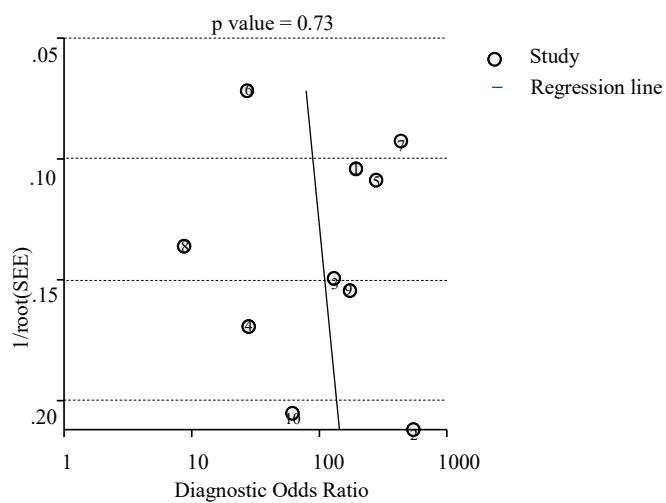
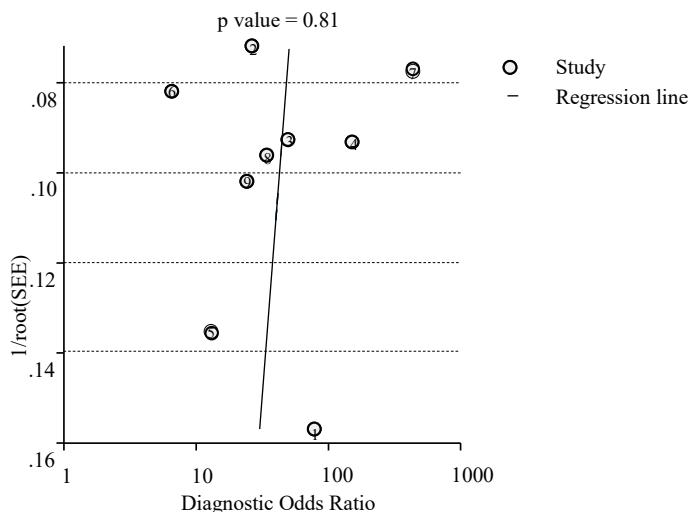
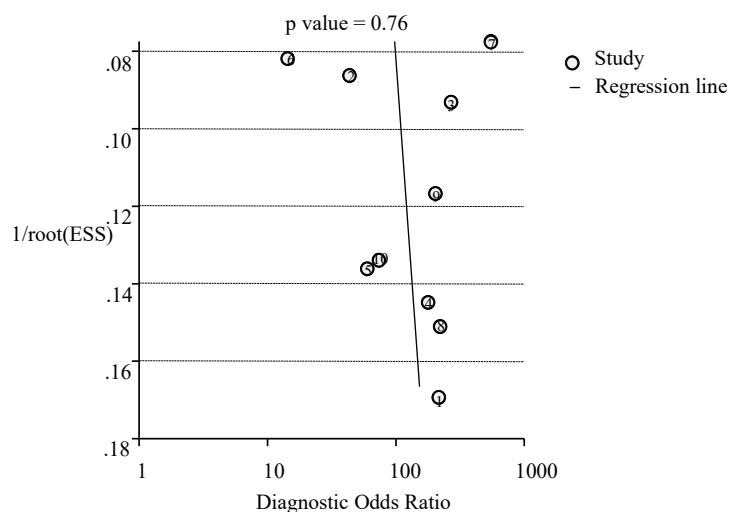


117 Meta-analysis estimates, given named study is omitted. a and b represent the exploratory and the validation cohort in Maiolino's study, respectively.

118 **Figure S6.** Sensitivity Analysis of the Saline Infusion Test



119 Meta-analysis estimates, given named study is omitted.

Figure S7. Funnel Plot Assessing Publication Bias of the ARR, CCT, and SIT**A. ARR****B. CCT****C. SIT**

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