PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Pg.1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Pg.3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Pgs.5-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Pg.6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Pg.6
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Pgs.6-7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Pgs.6-7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Pgs. 6-7
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Pgs. 7-8
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Pg. 9
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Pg.9
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Pg. 9
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Pgs.10-11

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Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Pgs. 10-11

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Pg.10
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Pg.10
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Pg.11
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Pgs.11-12
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Pg. 12
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Pgs. 13 and 15
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Pgs.13-14-15-16-17
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Pg. 12
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Pgs.13-14-15-16-17
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	Pg.18
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Pgs.18-19
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Pgs.19-20-21
FUNDING			

Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Pgs.11 and 22

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

Online only supplemental materials

Supplemental Tables:

sTable 1: Search Strategies (Medline and Embase)

sTable 2: Risk of bias assessments using PROBAST for risk assessment model studies

sTable 3: Risk of bias assessments using Quips for prognostic factor studies

sTable 4: Sensitivity analysis of studies that report an association between prognostic factors and symptomatic VTE only.

Supplemental Tables

sTable 1: Search Strategies (Medline and Embase)

Medline

Search name: z - Prognostic SR_Medline2

OVERVIEW	
Interface:	Ovid
Database:	Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present
Date of Search:	28 October 2017- alerts till May 2018
Study Types:	All
Limits:	Publication date: No limit

Search Strategy: search terms (number of results)	
VTE Block:	
1	Primary Prevention/ (17503)
2	Venous Thrombosis/pc [Prevention & Control] (4385)
3	Venous Thromboembolism/pc [Prevention & Control] (3582)
4	Pulmonary Embolism/pc [Prevention & Control] (4886)
5	Prevent*.mp. (1332101)

6 Thromboprophylax*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (4072)

7 Prophylax*.mp. (104027)

8 1 or 2 or 3 or 4 or 5 or 6 or 7 (1405763)

9 exp Venous Thromboembolism/ or exp Thromboembolism/ (53573)

10 exp Pulmonary Embolism/ (37750)

11 exp Venous Thrombosis/ (53428)

12 Thrombophlebitis/ (22521)

13 (DVT or VTE or PE).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (48782)

14 ((Pulmon* or vein or venous or lung) adj (Emboli* or thromb*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (107521)

15 (thrombus* or thrombotic* or thrombolic* or thromboemboli* or thrombos* or embol*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (377373)

16 (((deep or thromb* or stasis) adj2 (vein* or venous)) or (blood flow stasis or blood clot)).mp. [mp=title, abstract, original title, name of substance word, subject heading word,

keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (79440)

17 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 (425979)

18 8 and 17 (55938)

Prognosis filter:

19 Incidence.sh. (240248)

20 exp Mortality/ (359024)

21 Follow-Up Studies.sh. (628038)

22 Prognos:.tw. (524700)

23 Predict:.tw. (1363351)

24 Course:.tw. (580752)

25 19 or 20 or 21 or 22 or 23 or 24 (3152981)

26 18 and 25 (11256)

Clinical prediction guide filter:

27 predict:.mp. (1444321)

28 scor:.tw. (814052)

29 observ:.mp. (3283307)

30 27 or 28 or 29 (5007508)

31 18 and 30 (11822)

32 26 or 31 (17981)

Records Retrieved: 17981

Embase

Search name: z - Prognostic SR_Embase2

OVERVIEW	
Interface:	Ovid
Database:	Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present
Date of Search:	28 October 2017- alerts till May 2018
Study Types:	
Limits:	Publication date: No limit

Search Strategy: search terms (number of results)

VTE Block:

1 Primary Prevention/ (35278)

2 Venous Thrombosis/pc [Prevention & Control] (785)

3 Venous Thromboembolism/pc [Prevention & Control] (7088)

4 Pulmonary Embolism/pc [Prevention & Control] (1752)

5 Prevent*.mp. (2477729)

6 Thromboprophylax*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word] (6379)

7 Prophylax*.mp. (195774)

8 1 or 2 or 3 or 4 or 5 or 6 or 7 (2548335)

9 exp Venous Thromboembolism/ or exp Thromboembolism/ (433469)

10 exp Pulmonary Embolism/ (80922)

11 exp Venous Thrombosis/ (114178)

12 Thrombophlebitis/ (15800)

13 (DVT or VTE or PE).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word] (144215)

14 ((Pulmon* or vein or venous or lung) adj (Emboli* or thromb*)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word] (192152)

15 (thrombus* or thrombotic* or thrombolic* or thromboemboli* or thrombos* or embol*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word] (597995)

16 (((deep or thromb* or stasis) adj2 (vein* or venous)) or (blood flow stasis or blood clot)).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word] (182911)

17 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 (752356)

18 8 and 17 (147813)

Prognosis filter:

19 follow-up.mp. (1606000)

20	prognos:.tw. (730265)
21	ep.fs. (986253)
22	19 or 20 or 21 (3063360)
23	18 and 22 (30227)
Clinical prediction guide filter:	
24	validat:.mp. (630471)
25	index.tw. (873592)
26	model.tw. (2141395)
27	24 or 25 or 26 (3382557)
28	18 and 27 (15370)
29	23 or 28 (42534)
Records Retrieved: 42534	

sTable 2: Risk of bias assessments using PROBAST for risk assessment model studies

Author	Year	Participants	Predictors	Outcome	Analysis	Overall
Decousus	2011	+	+	+	-	-
Grant	2016	+	+	+	-	-
Mahan	2014	+	+	+	-	-
Rosenberg	2014	+	+	-	+	-
Rothberg	2011	+	+	+	-	-
Spyropoulos	2011	+	+	+	-	-
Zakai	2004	+	+	-	-	-
Zakai	2013	+	+	-	-	-
Zhou	2018	+	+	-	+	-

sTable 3: Risk of bias assessments using Quips for prognostic factor studies

Author	Year	Study participation	Study attrition	Prognostic factor measurement	Outcome measurement	Study confounding	Statistical analysis and reporting
Barclay	2013	Yes	Not reported	Yes	Yes	Yes	No
Bembenek	2011	Yes	29.6	Yes	Yes	Yes	Yes
Fan	2011	Yes	26.8	Yes	Yes	Yes	No
Kelly	2004	Yes	23.6	Yes	Yes	Yes	No
Mahan	2013	Yes	32.6	Yes	No	Yes	No
Ota	2009	Yes	0	Yes	Yes	Yes	No
Patell	2017	Yes	3.8	Yes	No	Yes	No
Yi	2012	Yes	4	Yes	Yes	Yes	No

sTable 4: Sensitivity analysis of studies that report an association between prognostic factors and symptomatic VTE only.

Prognostic factor	Analysis	Number of effect estimates	Number of studies	Sample size	Pooled OR	95% CI	
Age	Primary analysis	13	9	130,349	1.34	1.17	1.55
	Sensitivity analysis	10	7	128,867	1.31	1.11	1.55
Sex	Primary analysis	5	5	48,262	1.03	0.80	1.33
	Sensitivity analysis	2	2	47,403	1.00	0.68	1.48
Immobility	Primary analysis	11	8	83,134	2.92	2.09	4.08
	Sensitivity analysis	8	6	81,652	2.69	1.64	4.40
Paresis	Primary analysis	4	4	16,214	2.97	1.20	7.36
	Sensitivity analysis	3	3	16,112	2.48	0.77	8.05
Previous VTE	Primary analysis	9	8	84,403	6.08	3.71	9.97
	Sensitivity analysis	8	7	83,945	6.51	3.81	11.12
Active malignancy	Primary analysis	9	9	128,853	2.65	1.79	3.91
	Sensitivity analysis	7	7	128,293	2.81	1.89	4.18
Critical illness	Primary analysis	7	7	65,777	1.65	1.39	1.95
	Sensitivity analysis	6	6	65,319	1.63	1.37	1.93
Infections	Primary analysis	9	5	66,898	1.48	1.16	1.89
	Sensitivity analysis	8	4	66,440	1.42	1.09	1.87
Acute heart failure	Primary analysis	2	2	64,006	0.82	0.42	1.60
	Sensitivity analysis	1	1	63,548	1.08	0.84	1.39
History of heart failure	Primary analysis	4	3	2,291	2.68	1.11	6.44
	Sensitivity analysis	3	2	1,992	2.96	1.03	8.49
Severe stroke	Primary analysis	5	4	66,227	1.79	0.77	4.18
	Sensitivity analysis	4	3	65,769	2.00	0.69	5.78
Respiratory failure	Primary analysis	6	4	66,710	1.04	0.69	1.58
	Sensitivity analysis	5	3	66,252	1.05	0.68	1.61
Coronary artery disease	Primary analysis	4	4	65,912	1.01	0.33	3.09
	Sensitivity analysis	2	2	65,352	2.02	0.32	12.64

Online only supplemental figures

Part 1

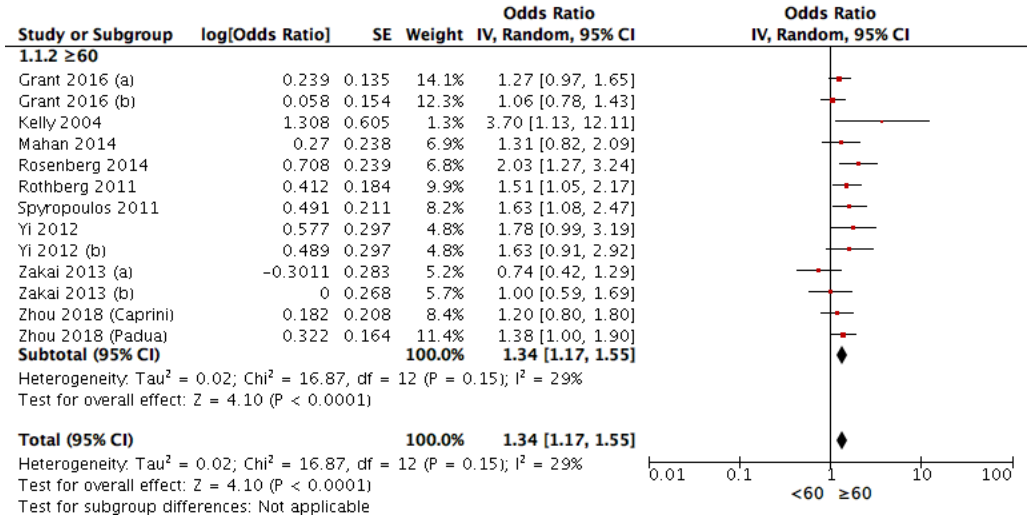
Supplemental Figures:

***sFigure 1: Forest plots showing the association between candidate prognostic factors and the outcome venous thromboembolism-Part 1 (From* sFigure 1A- sFigure 1R)**

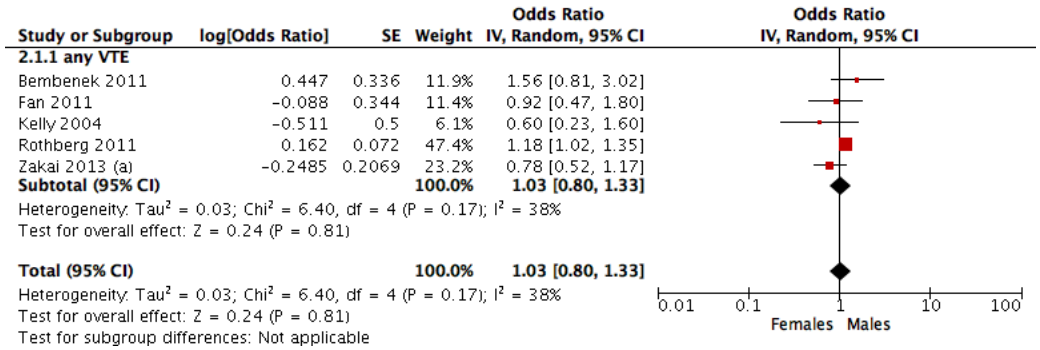
sFigure 1: Forest plots showing the association between candidate prognostic factors and the outcome venous thromboembolism-

***Part 1 (From* sFigure 1A- sFigure 1R)**

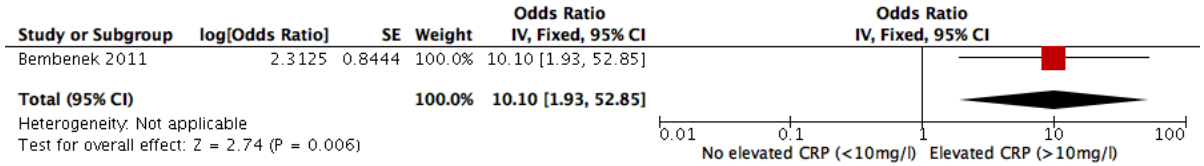
sFigure 1A: Forest plots showing the association between age and the outcome VTE



sFigure 1B: Forest plot showing the association between sex and the outcome VTE

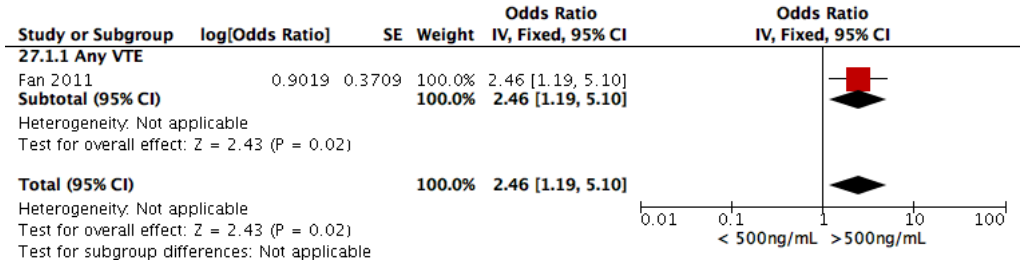


sFigure 1C: Forest plot showing the association between C-reactive protein and the outcome VTE

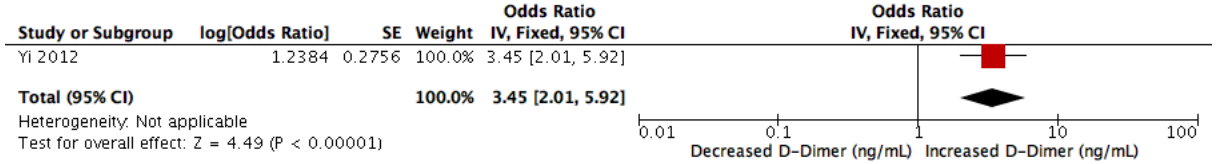


sFigure 1D: Forest plots showing the association between D-Dimer and the outcome VTE

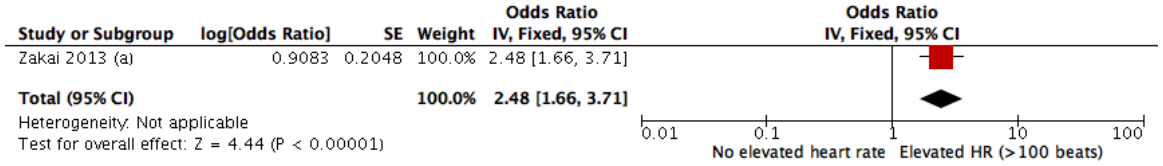
sFigure 1.1D: D-dimer (categorical)



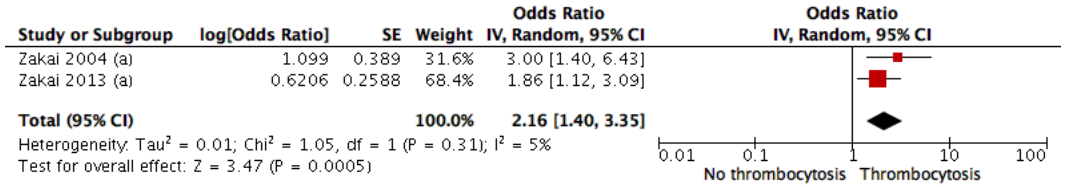
sFigure 1.2D: D-dimer (continuous)



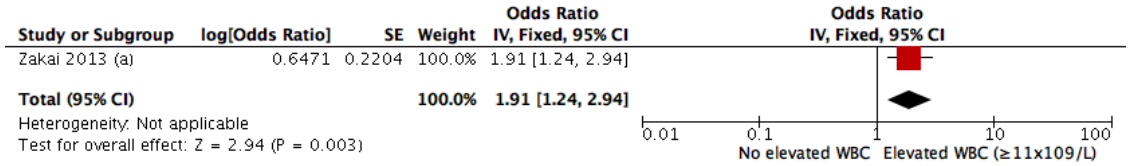
sFigure 1E: Forest plot showing the association between heart rate and the outcome VTE



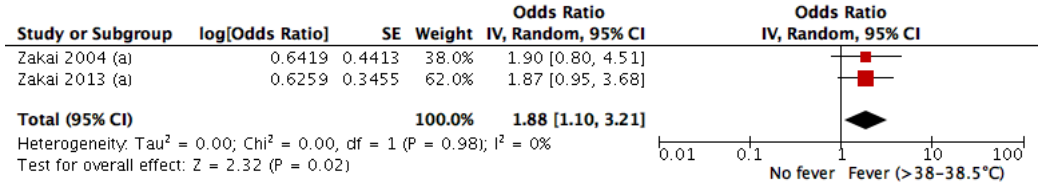
sFigure 1F: Forest plot showing the association between thrombocytosis and the outcome VTE



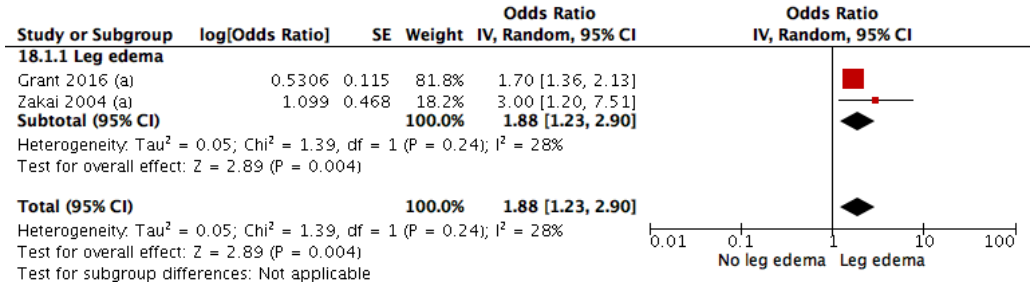
sFigure 1G: Forest plot showing the association between leukocytosis and the outcome VTE



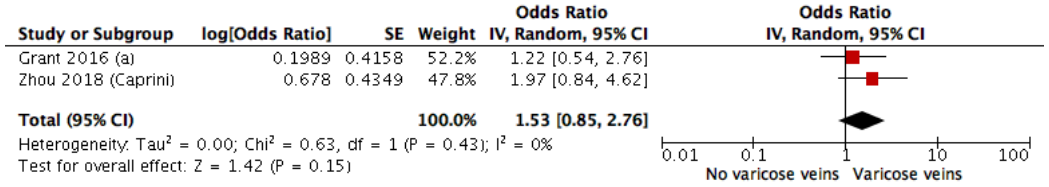
sFigure 1H: Forest plot showing the association between fever and the outcome VTE



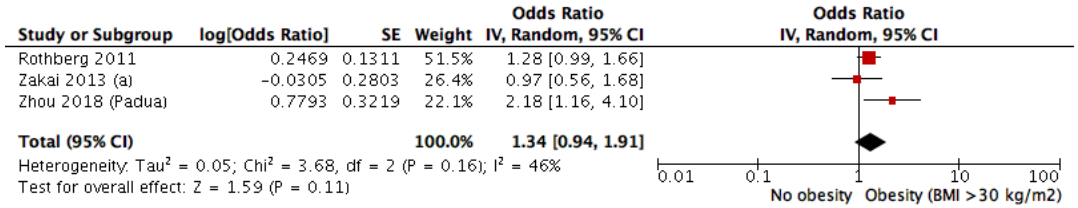
sFigure 1I: Forest plot showing the association between leg edema and the outcome VTE



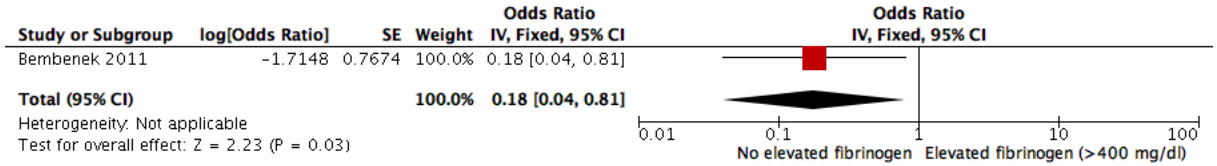
sFigure 1J: Forest plot showing the association between varicose veins and the outcome VTE



sFigure 1K: Forest plot showing the association between obesity and the outcome VTE

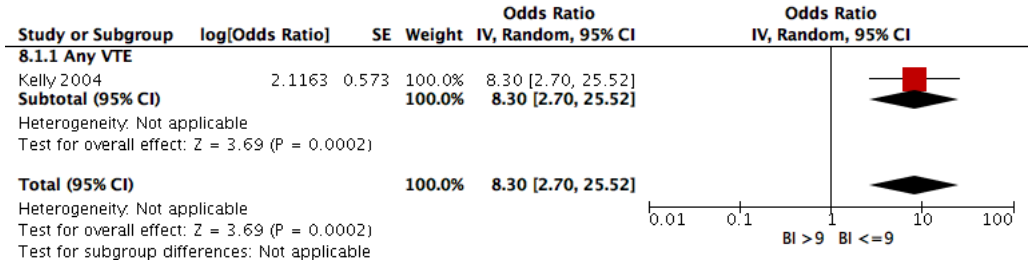


sFigure 1L: Forest plot showing the association between Fibrinogen levels and the outcome VTE

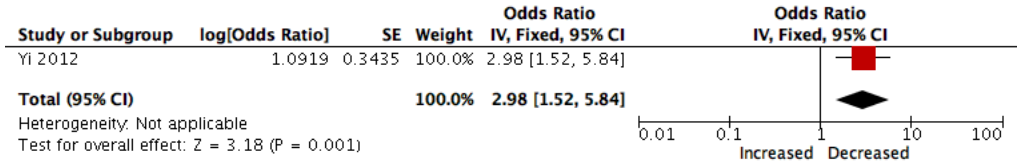


sFigure 1M: Forest plots showing the association between Barthel index score and the outcome VTE

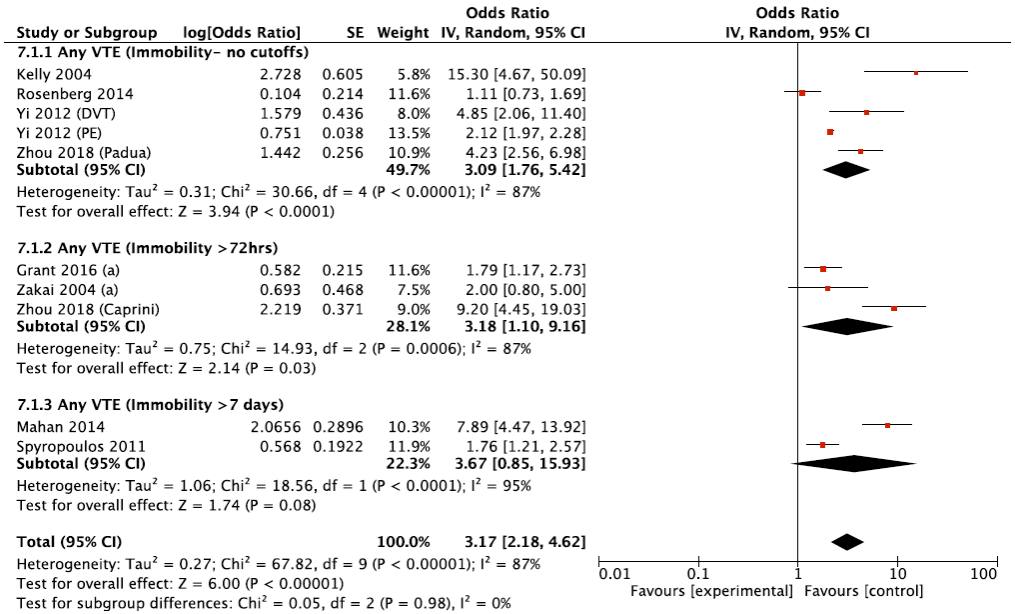
sFigure 1.1M: Barthel index score (categorical)



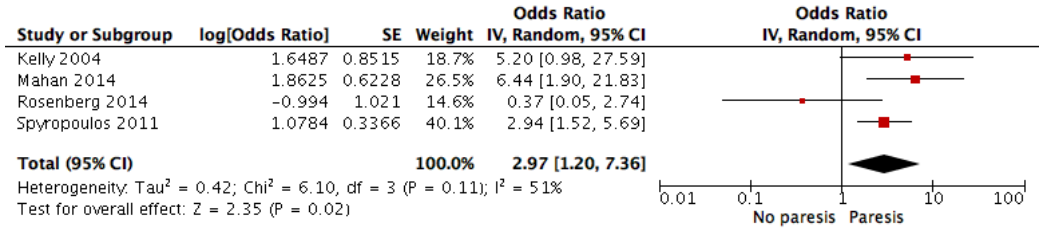
sFigure 1.2M: Barthel index score (continuous)



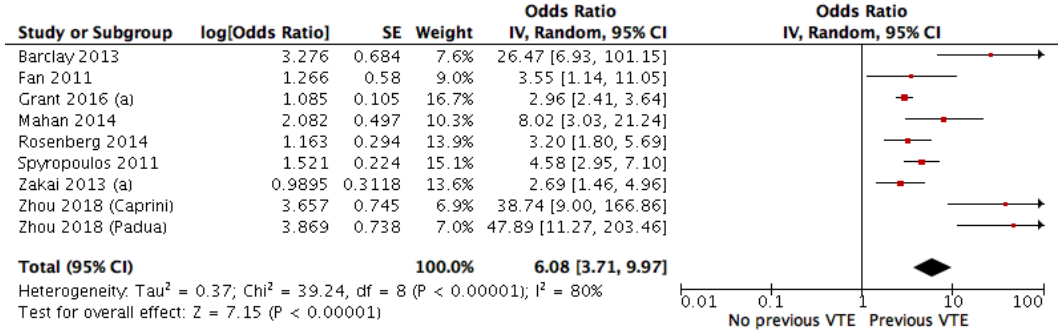
sFigure 1N: Forest plot showing the association between immobility and the outcome VTE



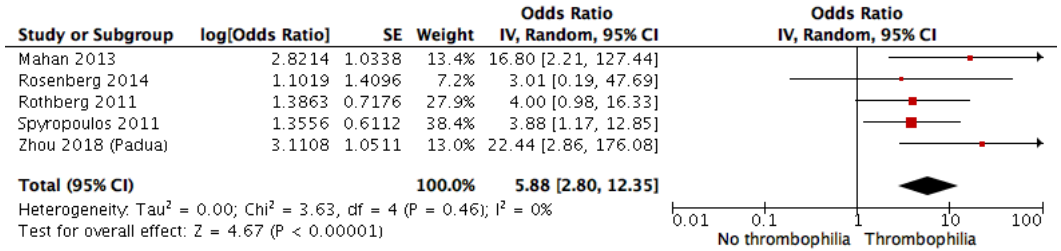
sFigure 1O: Forest plot showing the association between paresis and the outcome VTE



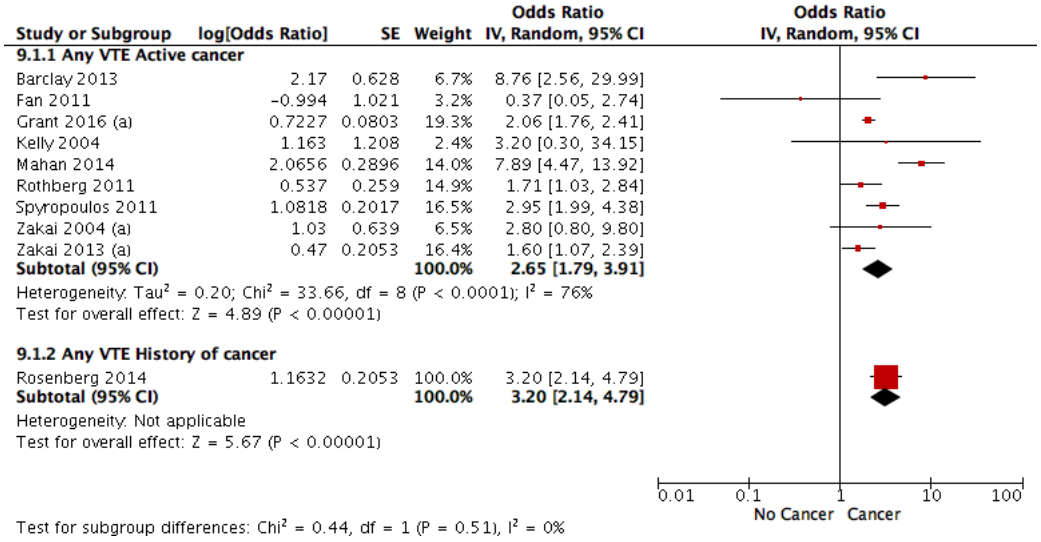
sFigure 1P: Forest plot showing the association between previous VTE and the outcome VTE



sFigure 1Q: Forest plot showing the association between thrombophilia and the outcome VTE



sFigure 1R: Forest plots showing the association between malignancy and the outcome VTE



Online only supplemental figures

Part 2

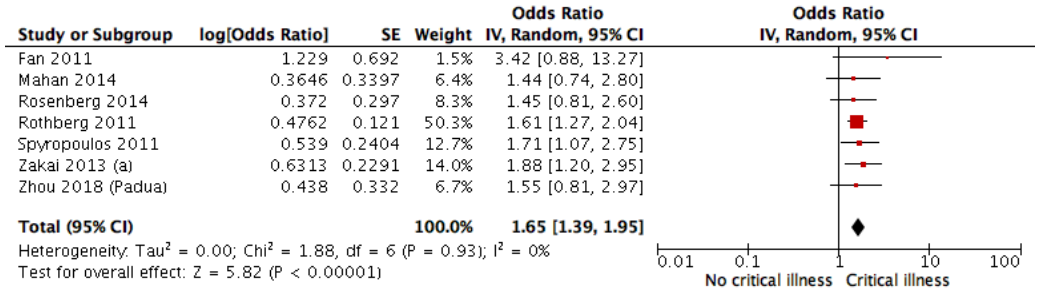
Supplemental Figures:

***sFigure 1: Forest plots showing the association between candidate prognostic factors and the outcome venous thromboembolism-Part 2 (from* sFigure 1S- sFigure 1AC)**

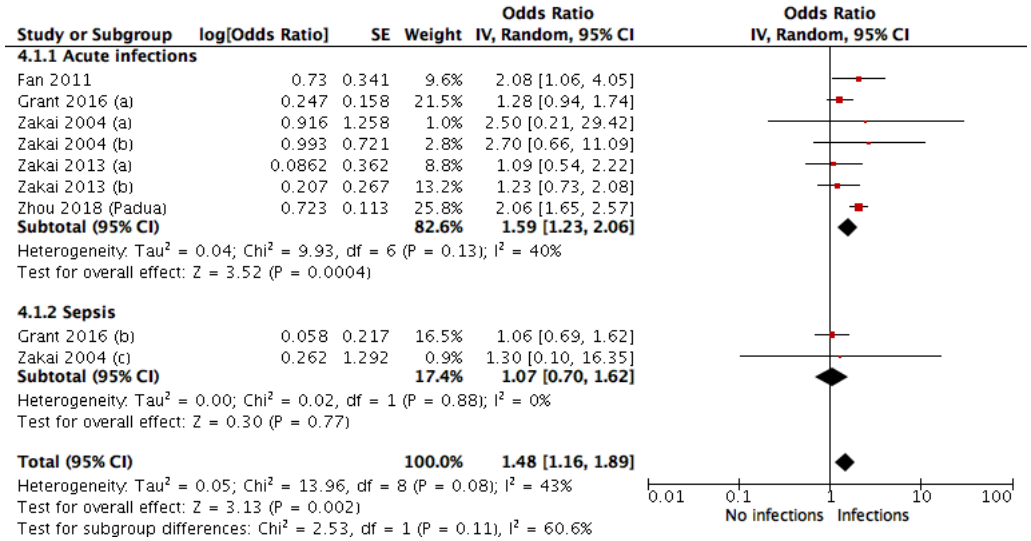
sFigure 2: Forest plots showing the association between candidate prognostic factors and the outcome bleeding

***sFigure 1: Forest plots showing the association between candidate prognostic factors and the outcome venous thromboembolism- Part 2 (from* sFigure 1S- sFigure 1AC)**

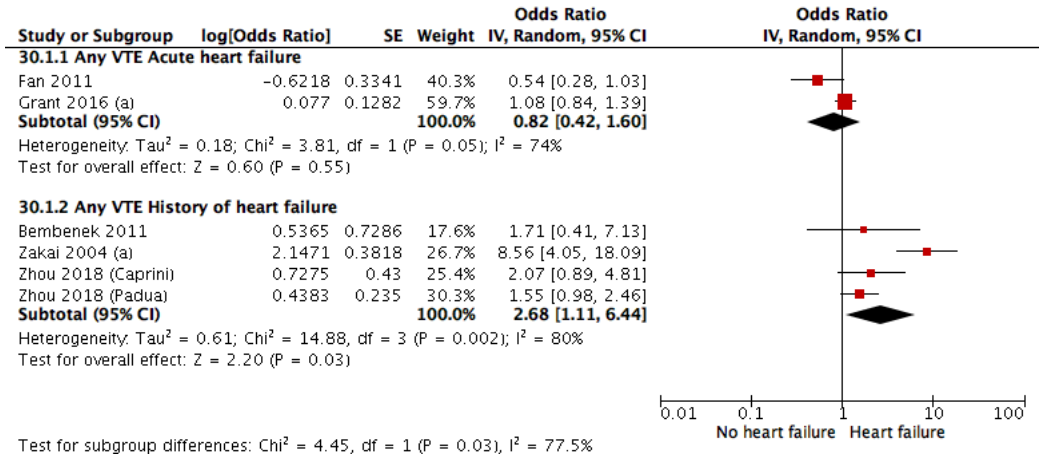
sFigure 1S: Forest plot showing the association between critical illness and the outcome VTE



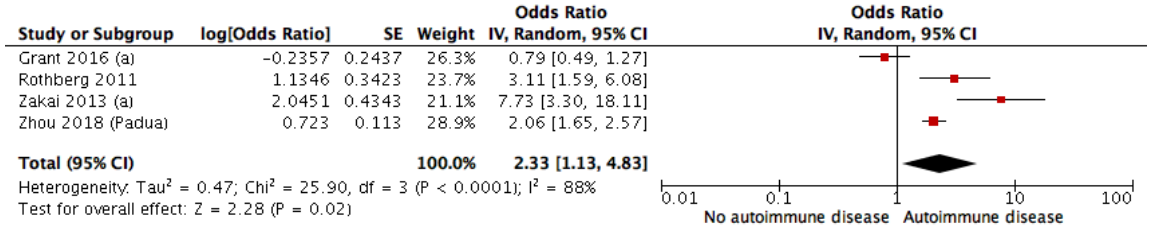
sFigure 1T: Forest plot showing the association between infections and the outcome VTE



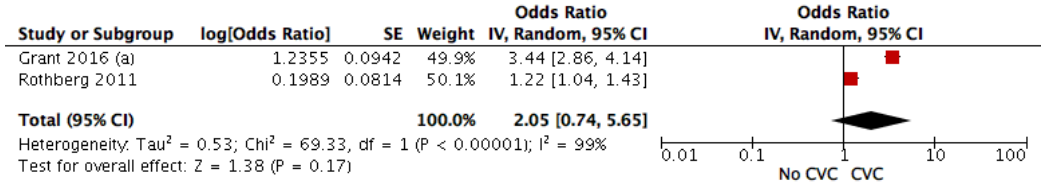
sFigure 1U: Forest plots showing the association between heart failure for the outcome VTE



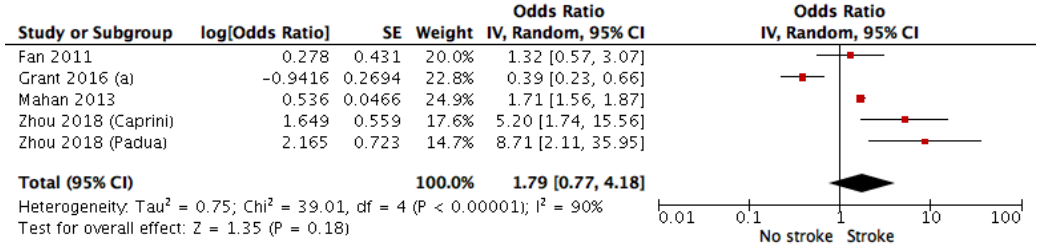
sFigure 1V: Forest plot showing the association between autoimmune disease and the outcome VTE



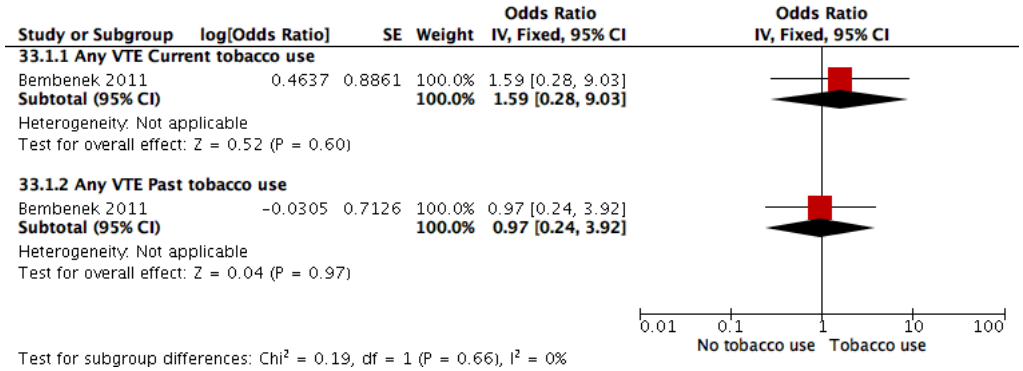
sFigure 1W: Forest plot showing the association between central venous catheters and the outcome VTE



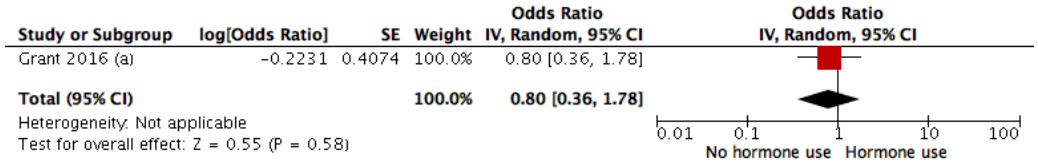
sFigure 1X: Forest plot showing the association between severe stroke and the outcome VTE



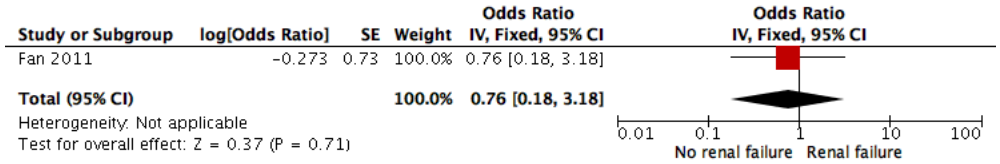
sFigure 1Y: Forest plots showing the association between tobacco and the outcome VTE



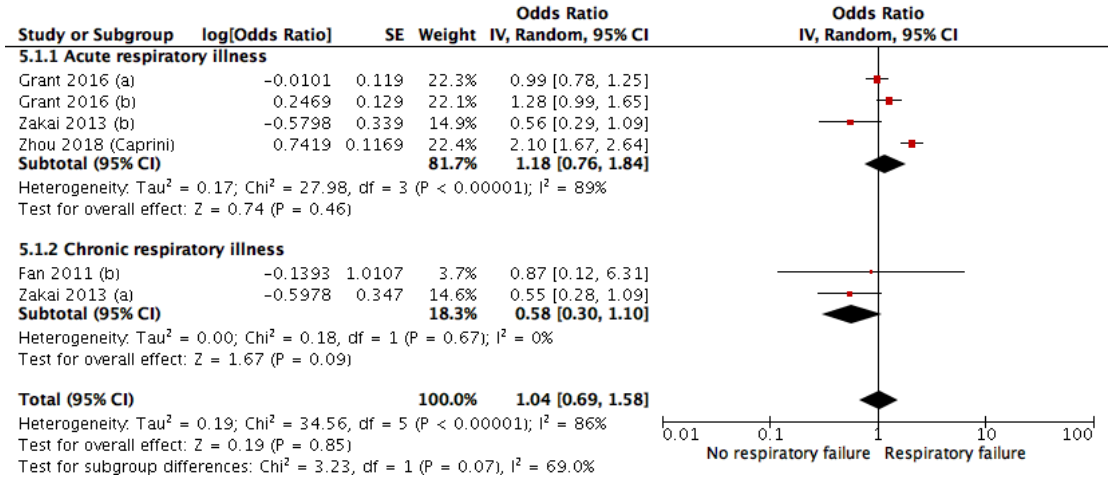
sFigure 1Z: Forest plot showing the association between hormone use and the outcome VTE



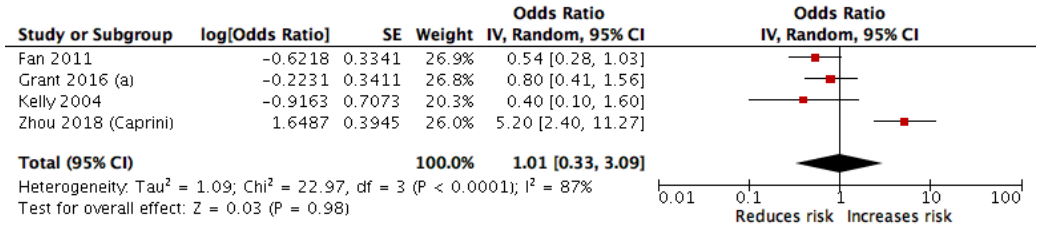
sFigure 1AA: Forest plot showing the association between renal failure and the outcome VTE



sFigure 1AB: Forest plot showing the association between respiratory failure and the outcome VTE

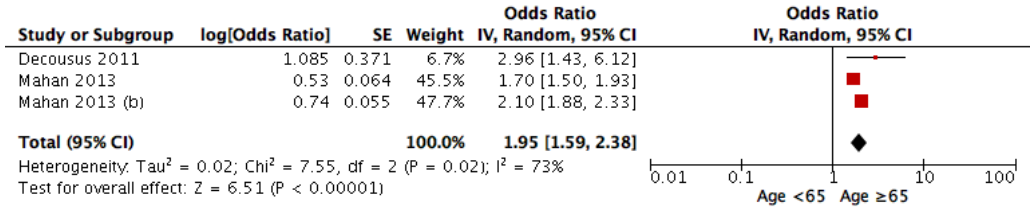


sFigure 1AC: Forest plot showing the association between coronary artery disease and the outcome VTE

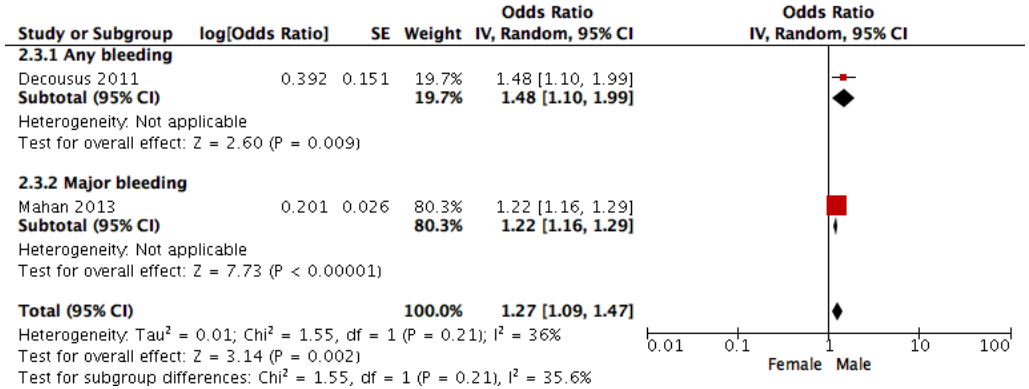


sFigure 2: Forest plots showing the association between candidate prognostic factors and the outcome bleeding

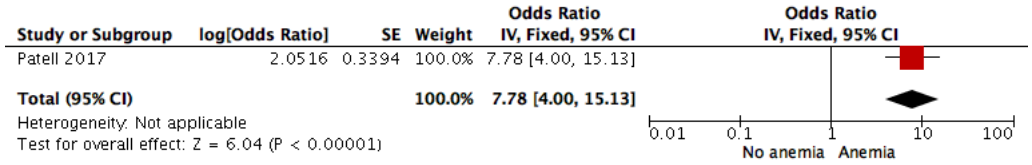
eFigure 2A: Forest plots showing the association between age and the outcome bleeding



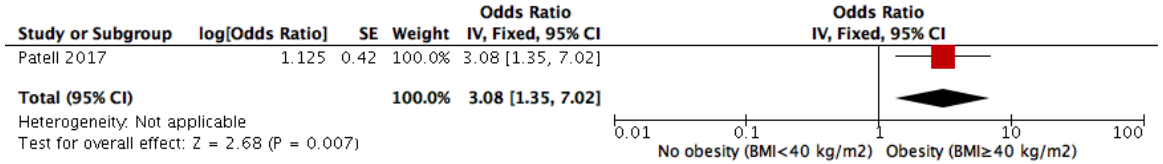
sFigure 2B: Forest plot showing the association between sex and the outcome bleeding



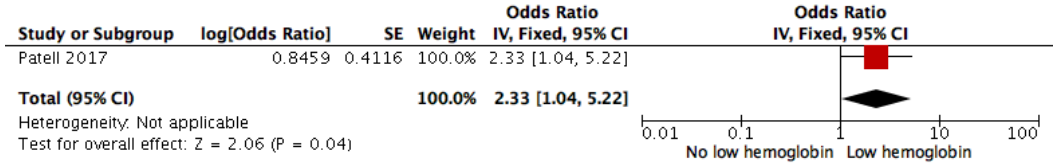
sFigure 2C: Forest plot showing the association between anemia as a reason for admission and the outcome bleeding



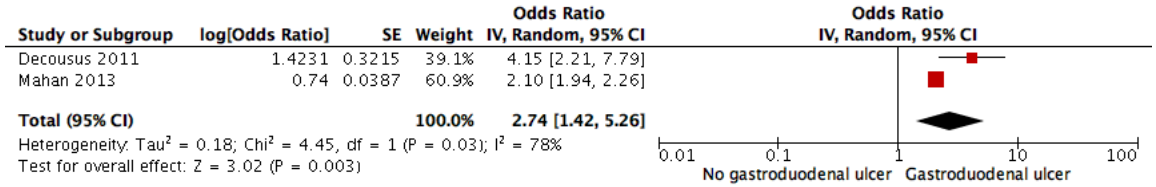
sFigure 2D: Forest plot showing the association between obesity and the outcome bleeding



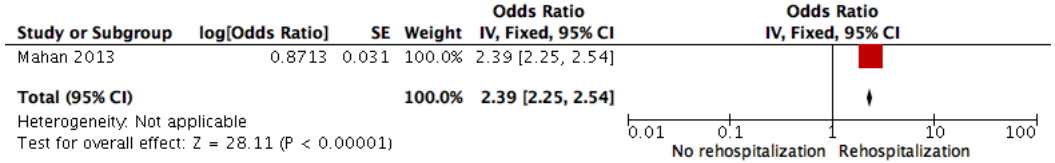
sFigure 2E: Forest plot of low hemoglobin for the outcome bleeding



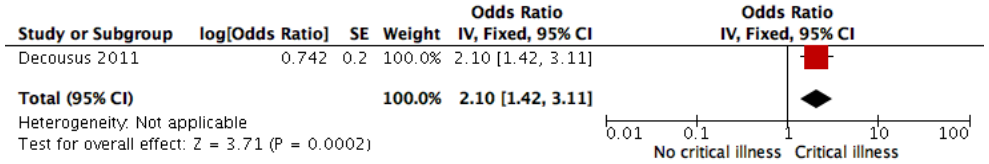
sFigure 2F: Forest plot showing the association between gastro-duodenal ulcers and the outcome bleeding



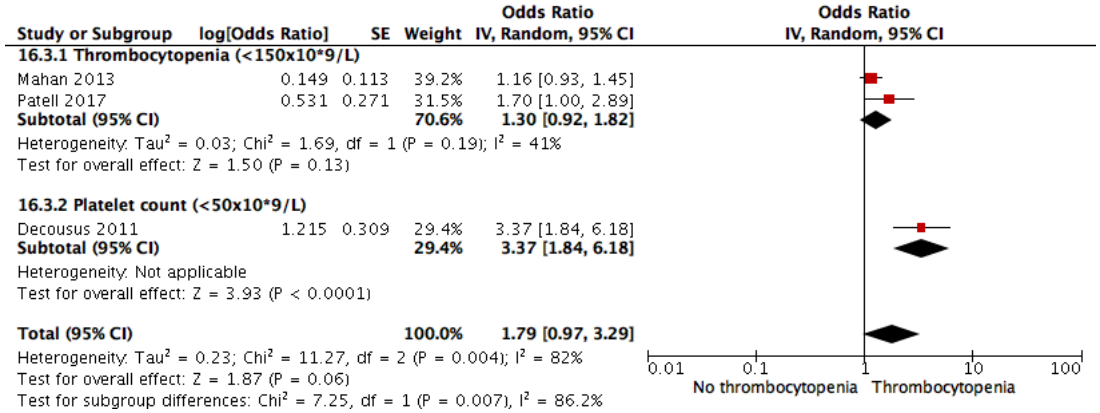
sFigure 2G: Forest plot showing the association between rehospitalisation and the outcome bleeding



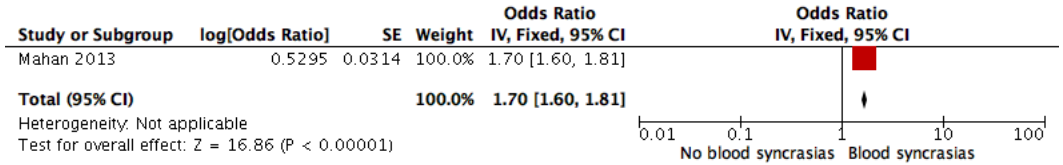
sFigure 2H: Forest plot showing the association between critical illness and the outcome bleeding



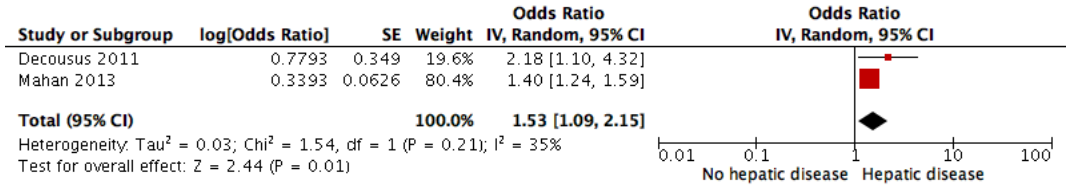
sFigure 2I: Forest plot showing the association between thrombocytopenia and the outcome bleeding



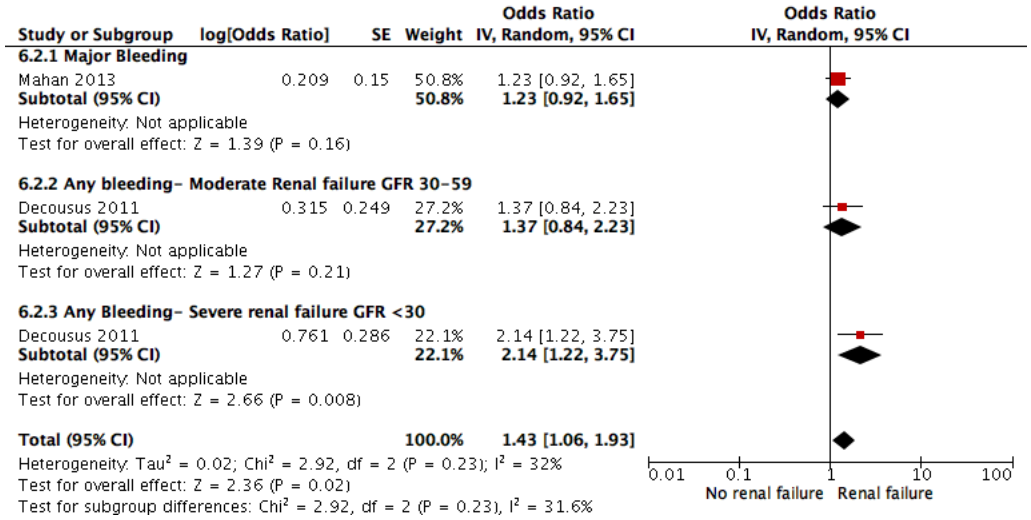
sFigure 2J: Forest plot showing the association between blood syncrasias and the outcome bleeding



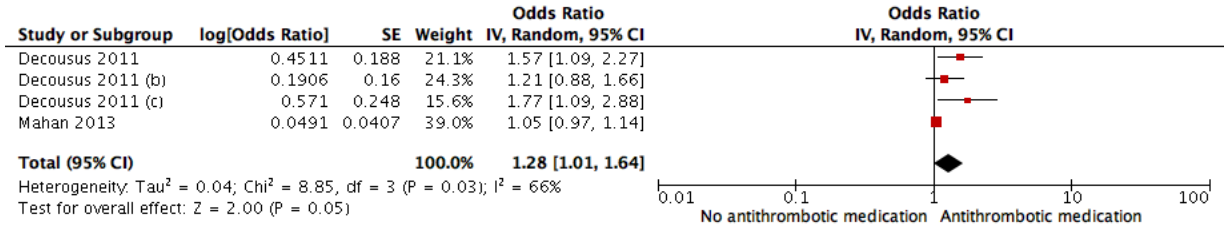
sFigure 2K: Forest plot showing the association between hepatic disease and the outcome bleeding



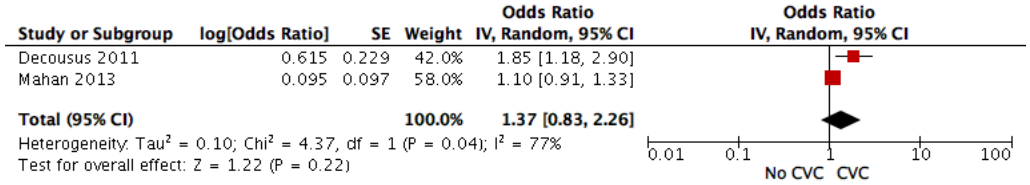
sFigure 2L: Forest plot showing the association between renal failure and the outcome bleeding



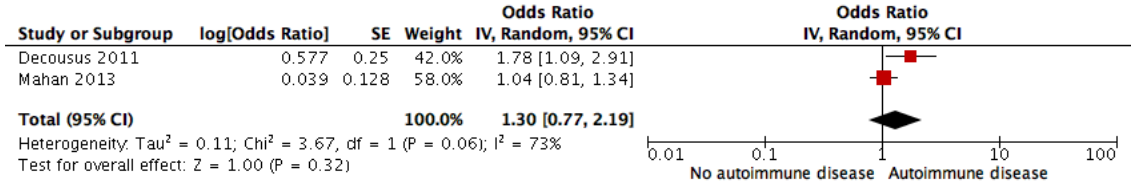
sFigure 2M: Forest plot showing the association between antithrombotic medication and the outcome bleeding



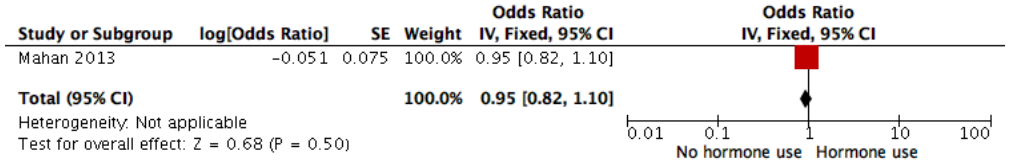
sFigure 2N: Forest plot showing the association between central venous catheters and the outcome bleeding



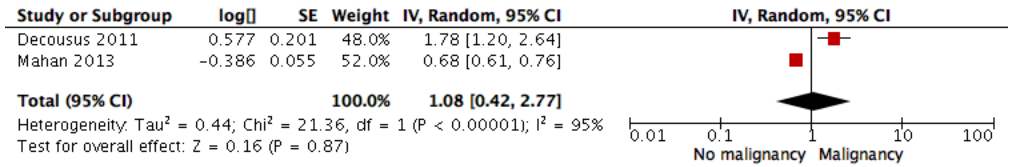
sFigure 2O: Forest plot showing the association between autoimmune disease and the outcome bleeding



sFigure 2P: Forest plot showing the association between hormone use and the outcome bleeding



sFigure 2Q: Forest plot showing the association between malignancy and the outcome bleeding


Study or Subgroup log[] SE Weight IV, Random, 95% CI
Decousus 2011 0.577 0.201 48.0% 1.78 [1.20, 2.64]
Mahan 2013 -0.386 0.055 52.0% 0.68 [0.61, 0.76]
Total (95% CI) 100.0% 1.08 [0.42, 2.77]
Heterogeneity: Tau² = 0.44; Chi² = 21.36, df = 1 (P < 0.00001); I² = 95%
Test for overall effect: Z = 0.16 (P = 0.87)
IV, Random, 95% CI
0.01
0.1
1
10
100
No malignancy
Malignancy