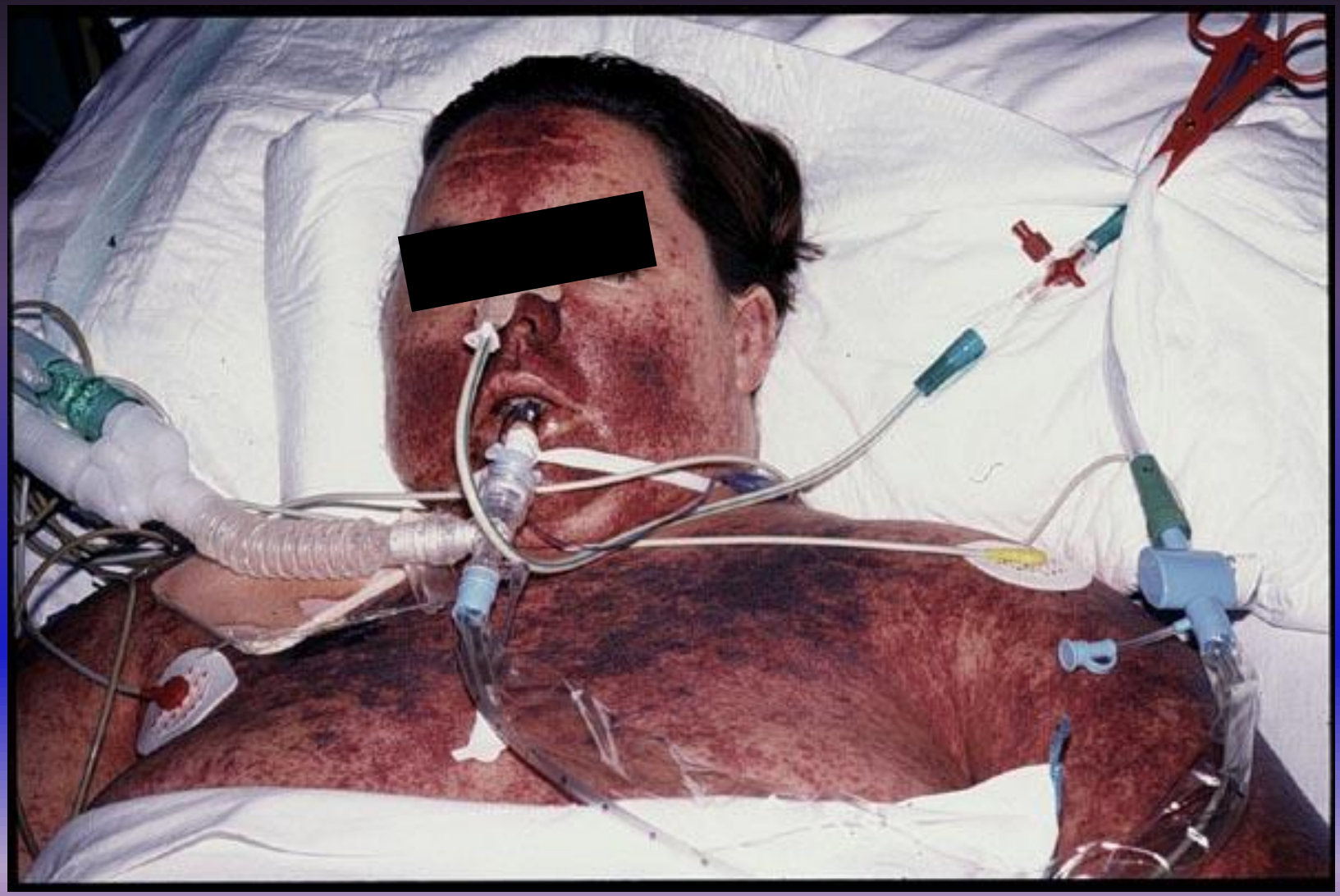
F A S T H U G S

Hôpital A. Vésale
Hôpital Civil
Hôpital V. Van Gogh
Hôpital L. Neuens
Hôpital L. de Vinci
C.H.U. de Charleroi

hromboembolie
Prophylaxie en soins intensifs

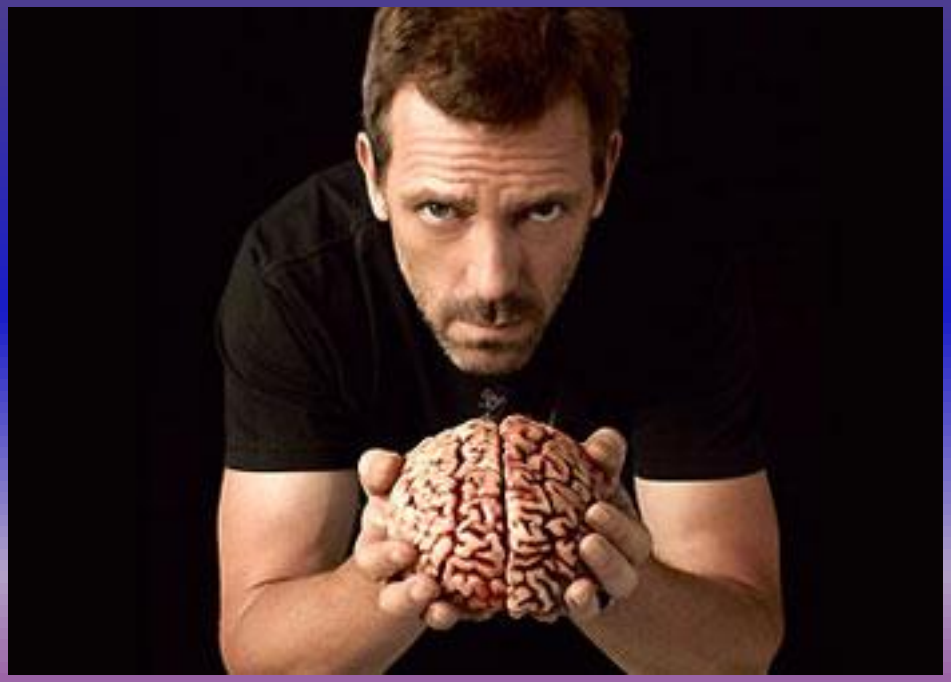
Prof M. Piagnerelli et Mme A. Joosten
CHU-Charleroi

Symposium SIZ nursing 2014



FAST HUGS

Point de vue du médecin…



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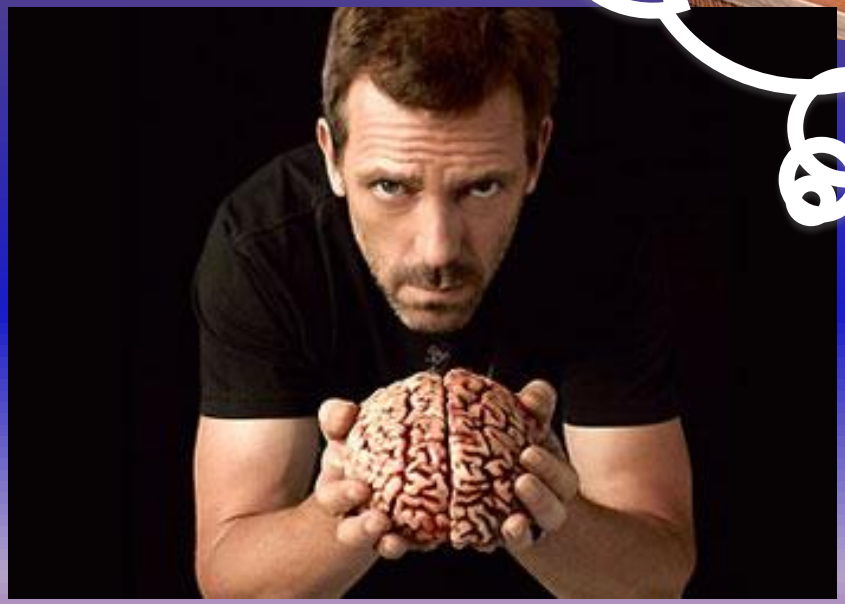
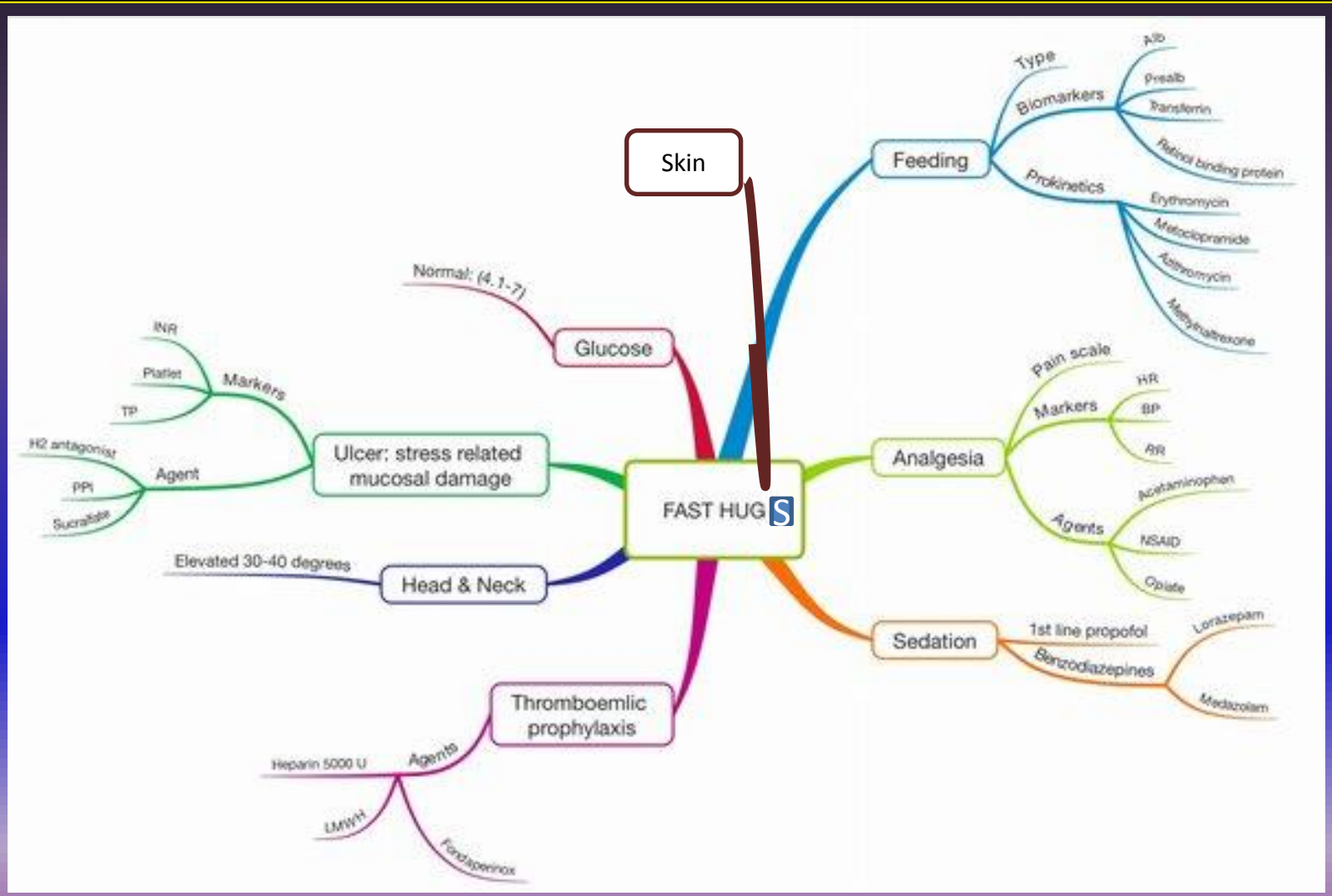


FAST HUG(S)


FAST HUG S
Skin
Feeding
Type
Biomarkers
Alb
prealb
Transferrin
Retinol binding protein
Prokinetics
Erythromycin
Metoclopramide
Azithromycin
Methylnaltrexone
Analgesia
Pain scale
Markers
HR
BP
RR
Agents
Acetaminophen
NSAID
Opiate
Sedation
1st line propofol
Benzodiazepines
Lorazepam
Midazolam
Glucose
Normal: (4.1-7)
Ulcer: stress related mucosal damage
Markers
INR
Platlet
TP
Agent
H2 antagonist
PPI
Sucralfate
Head & Neck
Elevated 30-40 degrees
Thromboemlic prophylaxis
Agents
Heparin 5000 U
LMWH
Fondaparinux

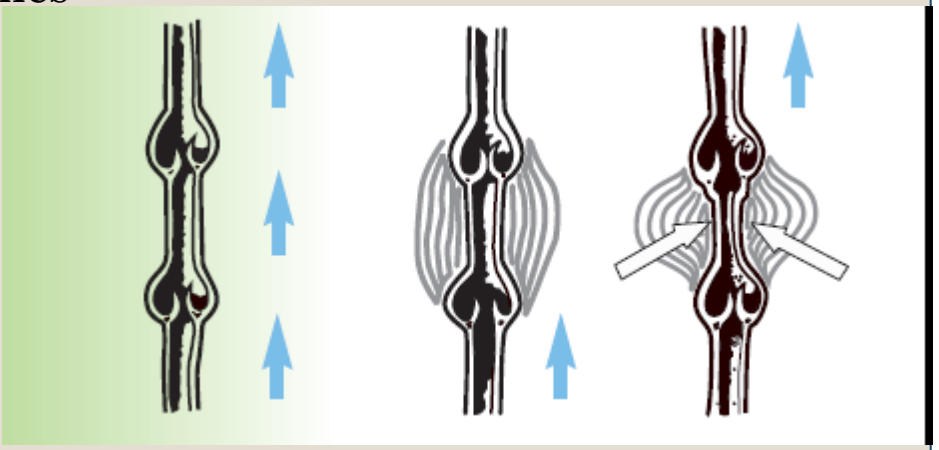
THROMBOPROPHYLAXIE

1. Est-ce vraiment nécessaire ?
2. Quel type d'anticoagulation?
3. Pour qui ?
4. Est-ce que cela fonctionne ?
5. Prophylaxie non pharmacologique = mécanique

1. Est-ce vraiment nécessaire ?

RAPPEL PHYSIOLOGIQUE

Les valves à différents niveaux des veines empêchent, lorsqu'elles sont en bon état, le sang de refluer vers le bas.

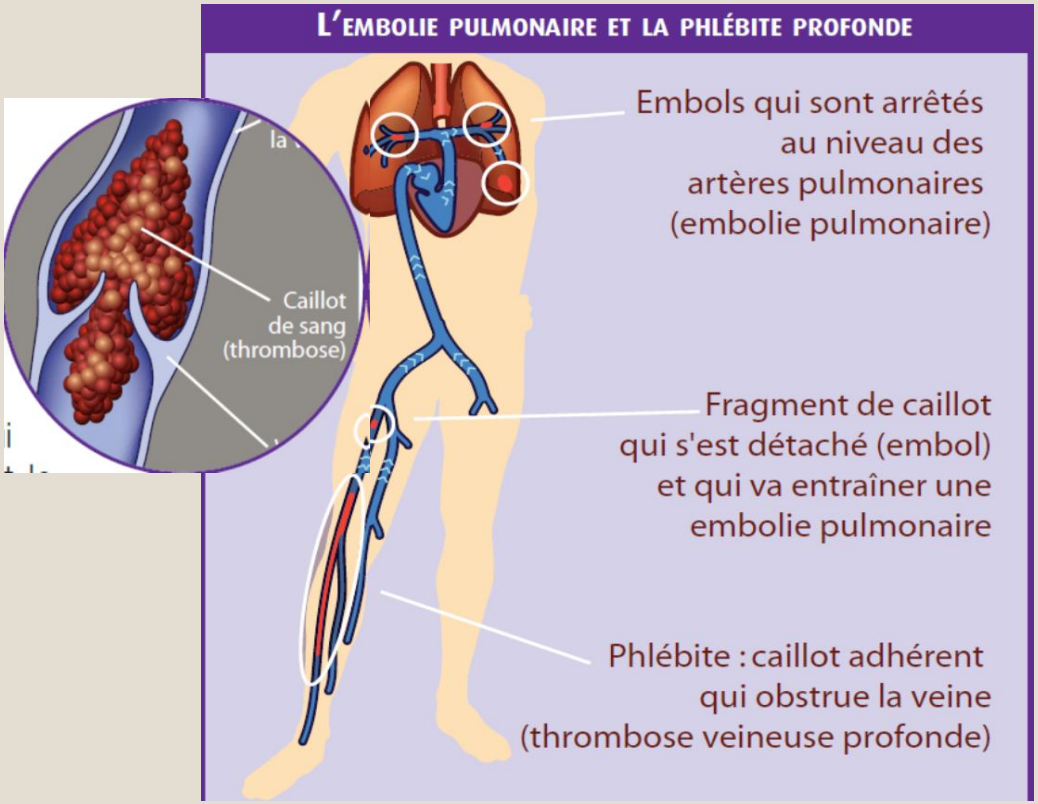


Les muscles du mollet :
leur contraction lors des mouvements (la marche entre autres) comprime les veines situées sous le genou et contribue également à la propulsion du sang vers le haut.

La "pompe plantaire": la plante du pied comporte un réseau spongieux de vaisseaux sanguins. Lors de la marche, la compression de cette "éponge" sanguine aide à la propulsion du sang vers le haut.

Formation d'un caillot

- Caillot ➡ phlébite ➡ embolie pulmonaire



Causes

Stase : immobilisation = effet pompe musculaire

- Alitement prolongé, plâtres, long voyage
- Bas débit (insuffisance cardiaque)

Anomalies biologiques

- Acquises : modifications hormonales, maladie inflammatoire, cancer …
- Constitutionnelles :anomalie héréditaire de l'hémostase

Maladie thromboembolique

- Pathologie d'accompagnement
  - Complique l'évolution d'une autre pathologie ou acte chirurgical
  - Presque tous les patients hospitalisés ont 1 ou plusieurs facteurs risques
  - TVP courante chez patients hospitalisés
  - TVP et EP nosocomiales sont cliniquement silencieuses
  - Difficulté de déterminer quels patients à risque développeront des complications thrombotiques

TVP: thrombose veineuse profonde

EP : embolie pulmonaire

PREVALENCE

- Belgique
  - +/- 10.000 personnes souffrent de thrombose veineuse
  - environ 1/3 meurent ensuite d'embolie pulmonaire

  L'embolie pulmonaire est la cause la plus évitable de décès à l'hôpital.

Prophylaxie médicamenteuse

Thrombose veineuse profonde et embolie pulmonaire

- Meta-analyse de 7 études
- 7226 patients de réanimation polyvalente inclus
- Comparaison: tous types d'héparine versus pas d'héparine ou autres types de prophylaxie

Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098

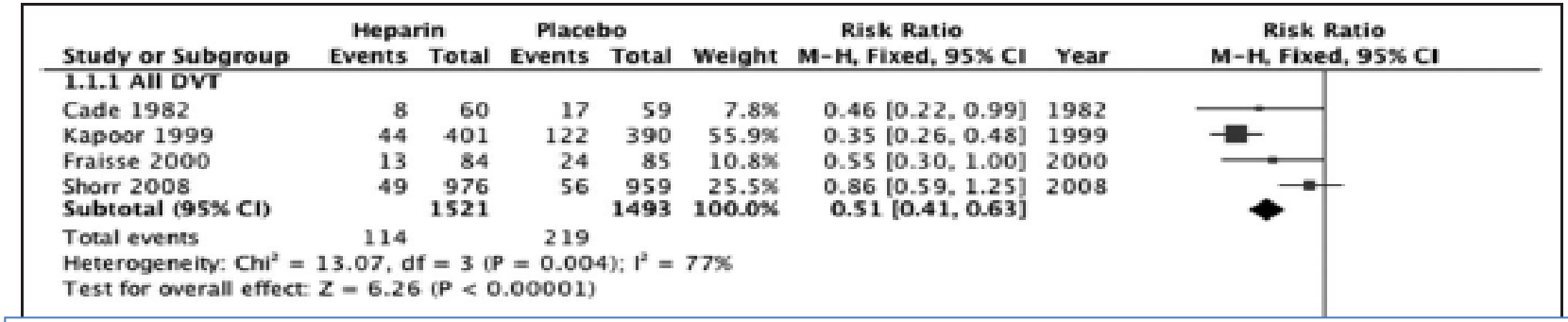
Thrombose veineuse profonde et embolie pulmonaire

TABLE 1. Trial Characteristics Addressing Heparin Thromboprophylaxis in Medical-Surgical ICU Patients

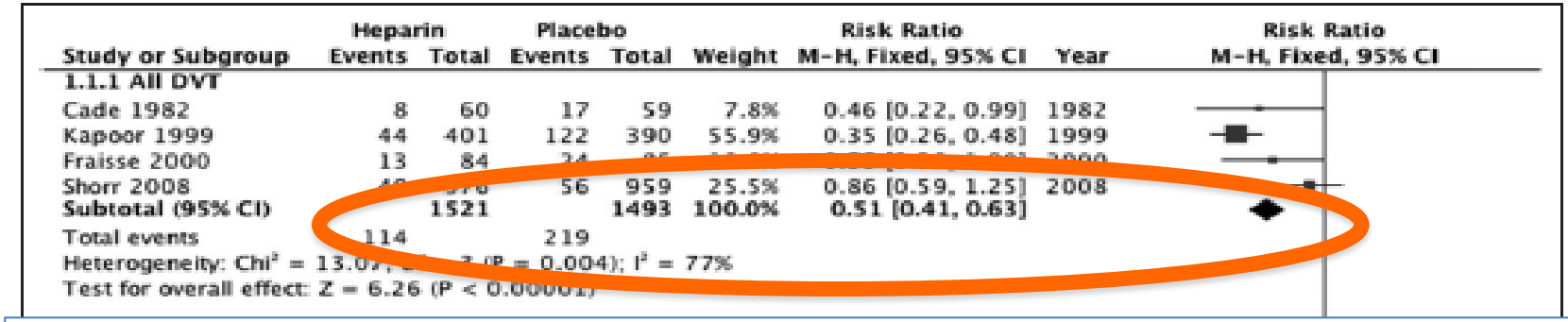
Author (Year)	Centers	Patients	Intervention and Comparison	DVT Evaluation	Follow-Up	Mechanical Prophylaxis
UFH vs control						
Cade (9)	Single center RCT	119 medical-surgical ICU patients	UFH 5,000 IU SC bid vs placebo for 10 d, until ambulant or a DVT occurred	DVT detected by daily fibrinogen leg scanning for median 7.7 d (4–10 d)	Not reported (while in ICU)	Not reported
Kapoor et al (22), abstract	Multicenter RCT	791 medical ICU patients	UFH 5,000 IU SC bid vs placebo	DVT detected by US at admission and every 72 hr in ICU	During ICU stay	Not reported
LMWH vs control						
Fraisse et al (12)	34 center RCT	223 ventilated patients with COPD	LMWH (nadroparin ~ 65 IU/kg SC OD) vs placebo until weaned or up to day 21	DVT detected by weekly US and venography by day 21	Up to 21 d	Not reported
LMWH vs UFH						
Goldhaber et al (23), abstract	28 center RCT	310 medical ICU patients	LMWH (enoxaparin 30 mg SC bid) vs UFH 5,000 Units SC bid	DVT detected by US on days 3, 7, 10, and 14 after ICU admission	Not reported (at least day 14)	All patients received graduated compression stockings
Shorr and Williams (14)	224 center RCT	1,935 sepsis patients receiving drotrecogin alfa	LMWH (enoxaparin 40 mg SC OD) vs UFH 5,000 IU SC bid vs placebo over 4 d drotrecogin alfa infusion	DVT detected by compression US between days 4 and 6	Up to 28 d	Mechanical prophylaxis formally encouraged during drotrecogin alpha infusion; 56% used it at some point in trial
De et al (13)	Single center RCT	156 surgical ICU patients	LMWH (enoxaparin 40 mg OD) vs UFH 5,000 IU SC bid for 6 d	DVT detected by Doppler US between postoperative days 5 and 7 and if clinical suspicion	4 wk and 6 mo postoperative follow-up	Mechanical prophylaxis not allowed
PROTECT (15)	67 center RCT	3,764 medical-surgical ICU patients	LMWH (dalteparin 5,000 IU SC OD) vs UFH 5,000 IU SC bid	Proximal DVT detected by compression US within 2 d of admission, twice weekly and as clinically indicated	Up to hospital discharge	Mechanical prophylaxis not allowed unless heparin contraindicated; violations were stockings (2.7% dalteparin, 2.6% UFH); pneumatic compression devices (2.0% dalteparin, 1.6% UFH)

DVT — deep vein thrombosis, UFH — unfractionated heparin, RCT — randomized clinical trial, IU — international units, SC — subcutaneous, US — ultrasound, LMWH — low-molecular-weight heparin, COPD — chronic obstructive pulmonary disease, OD — once daily.

Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098



Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098



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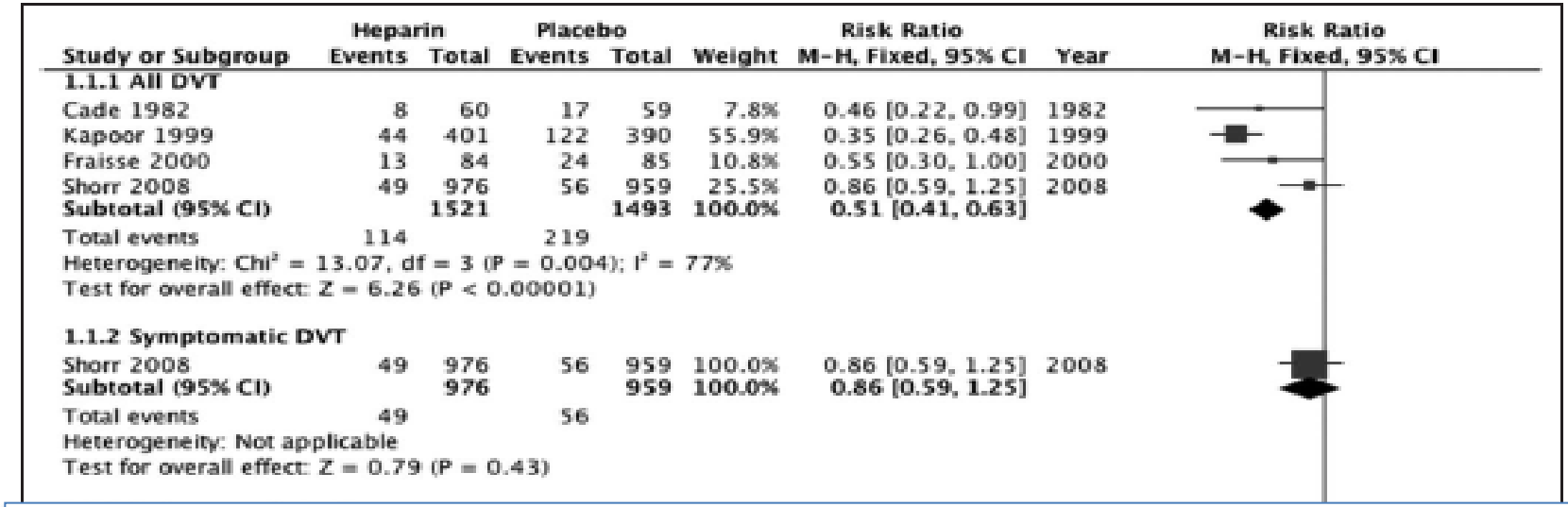

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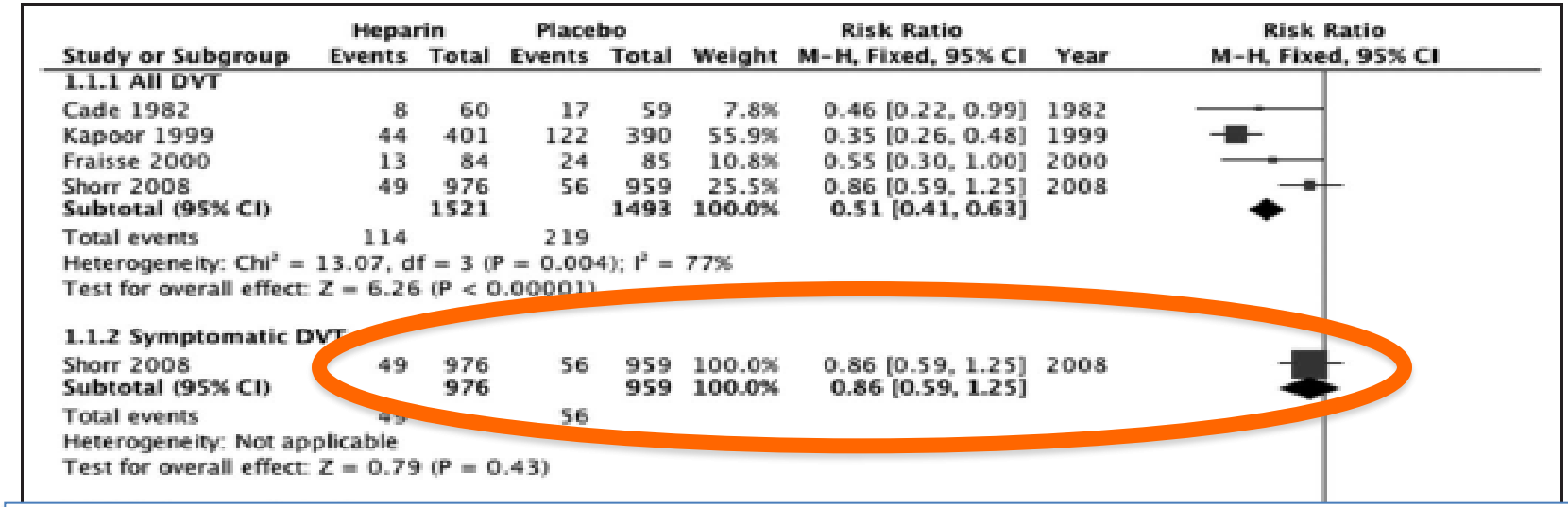
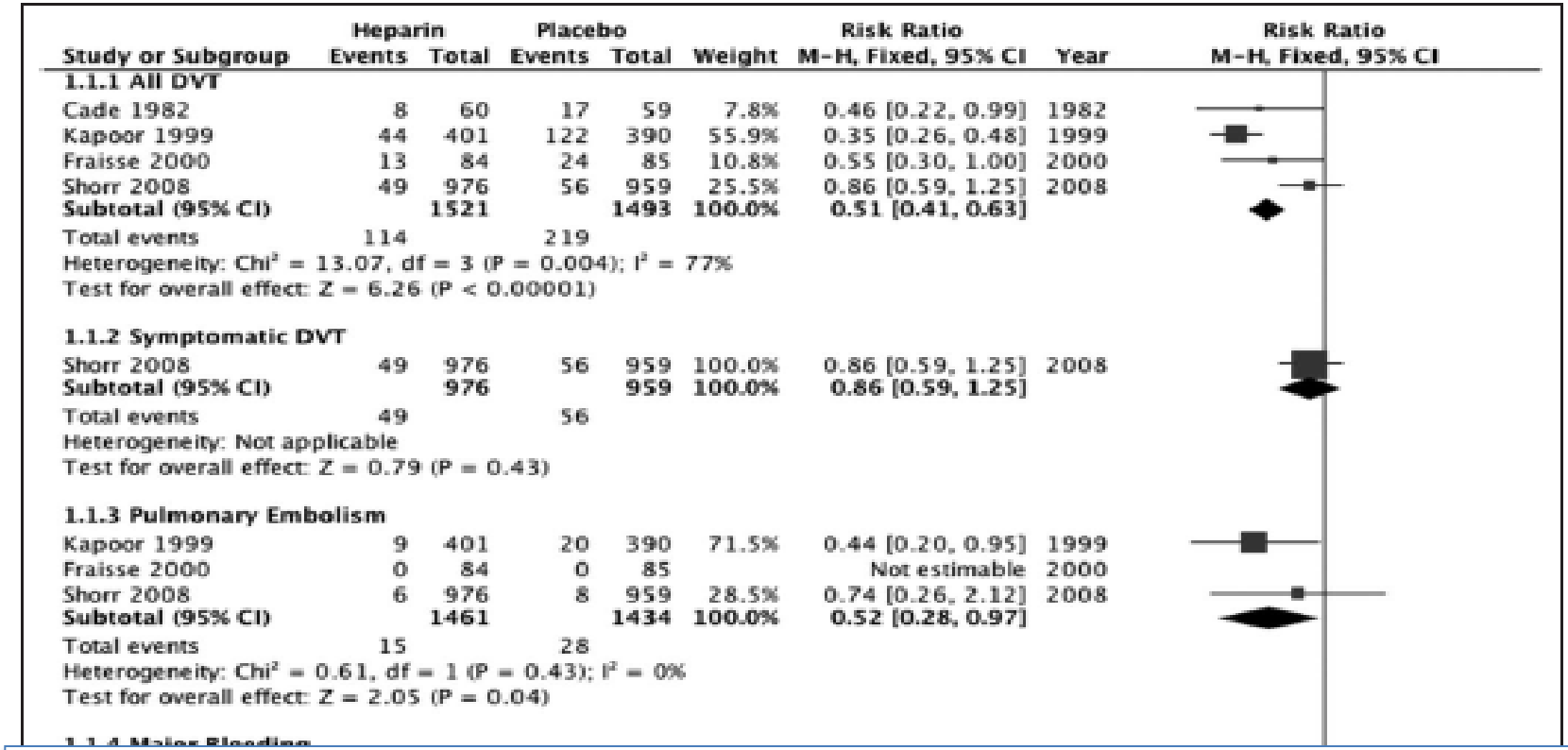


Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098



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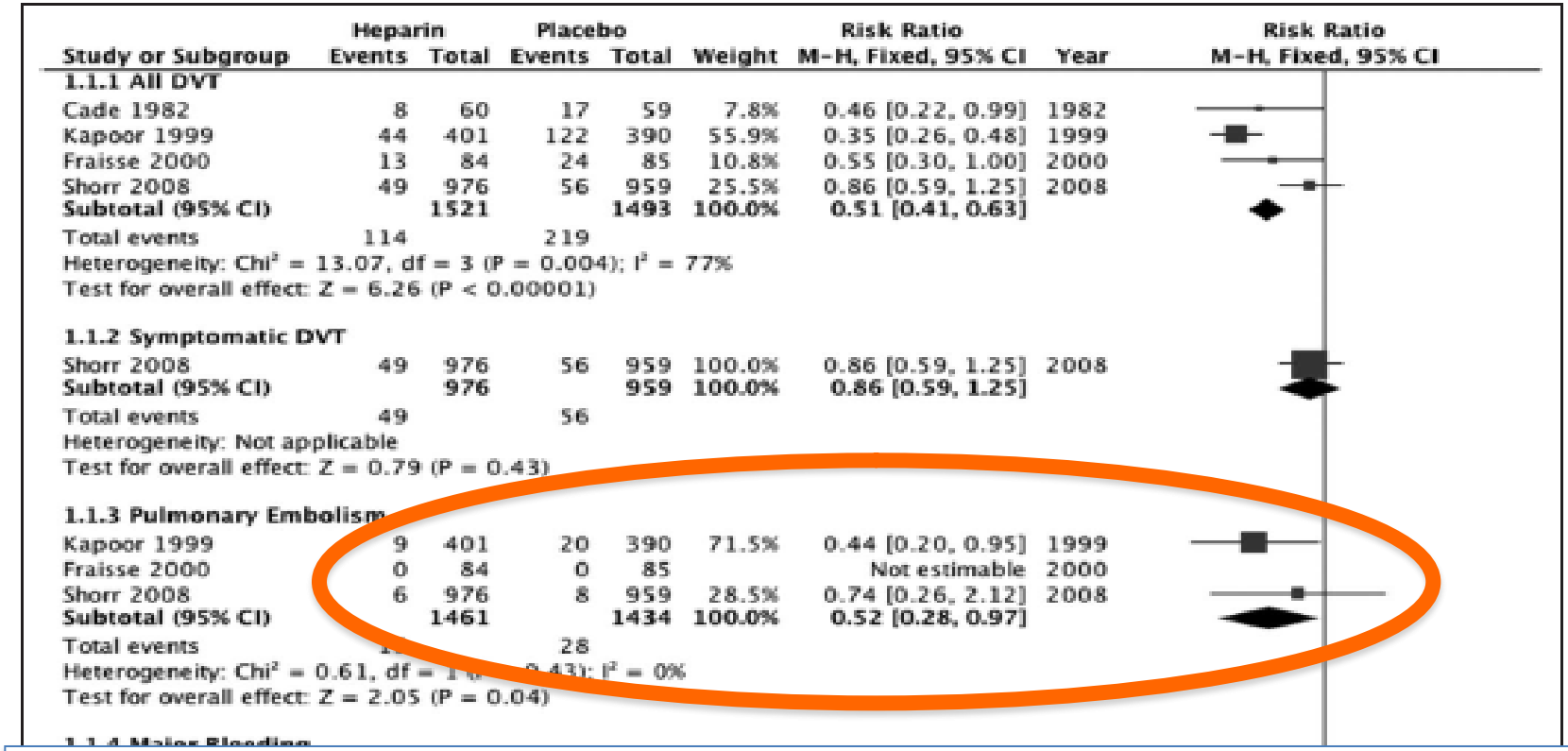

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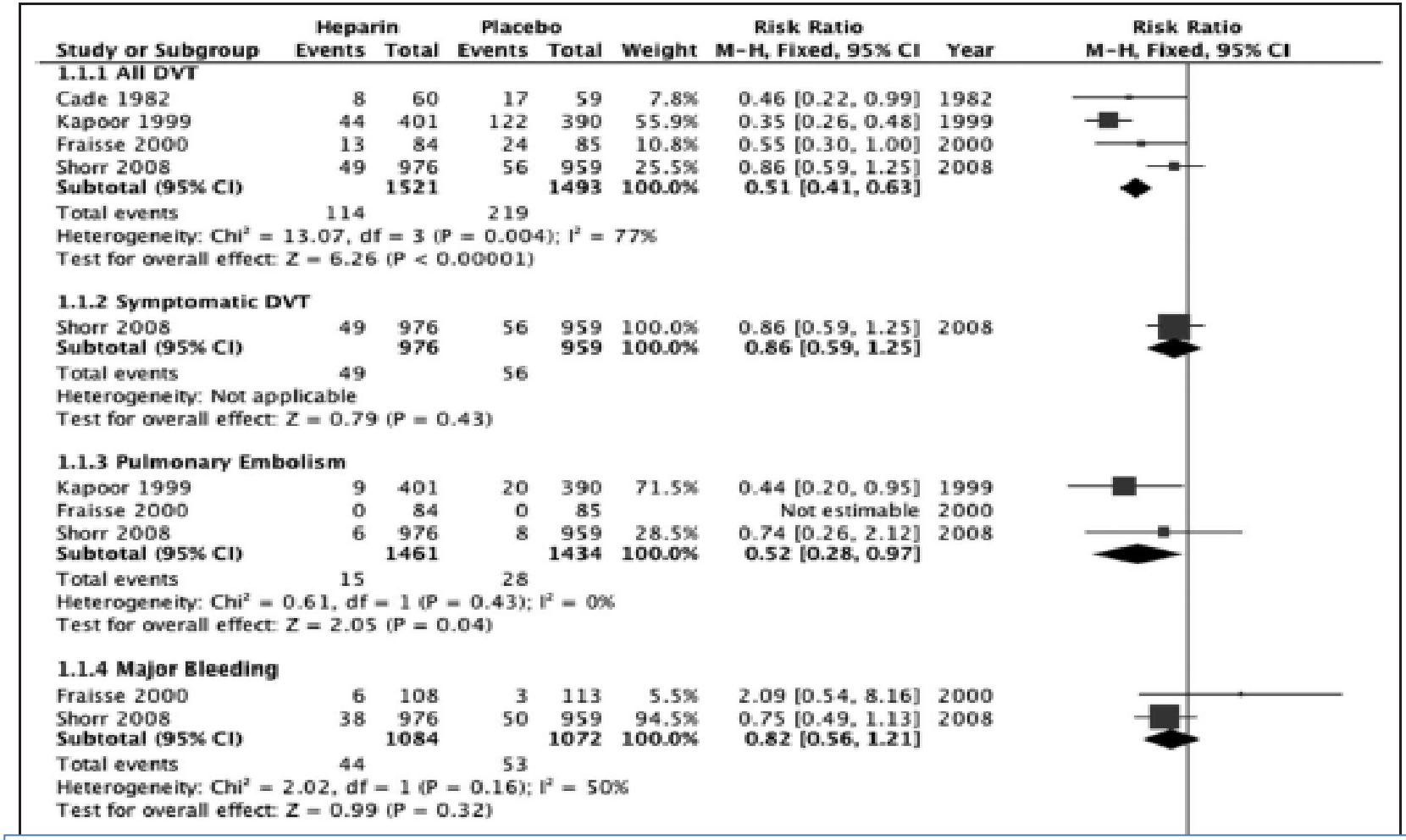

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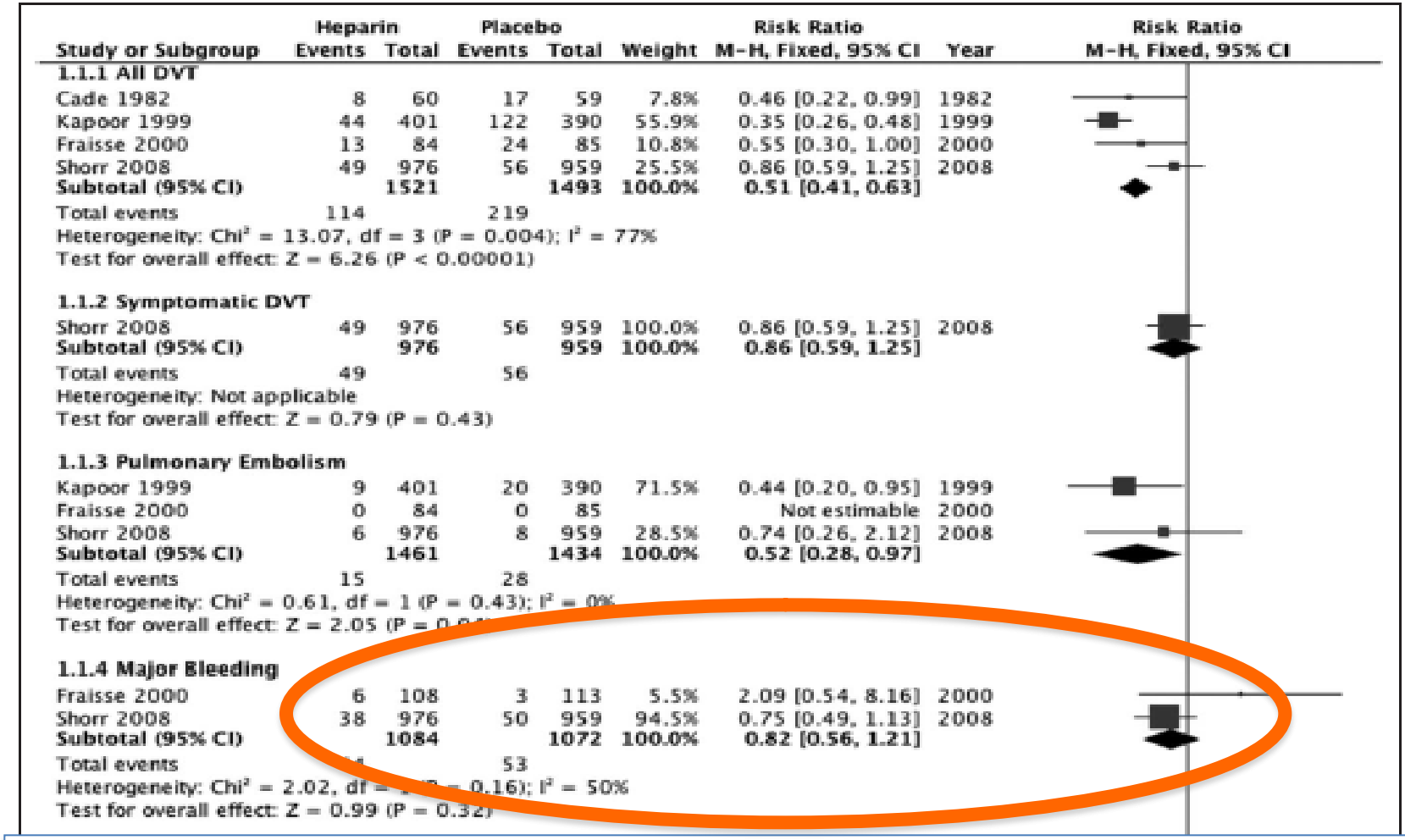

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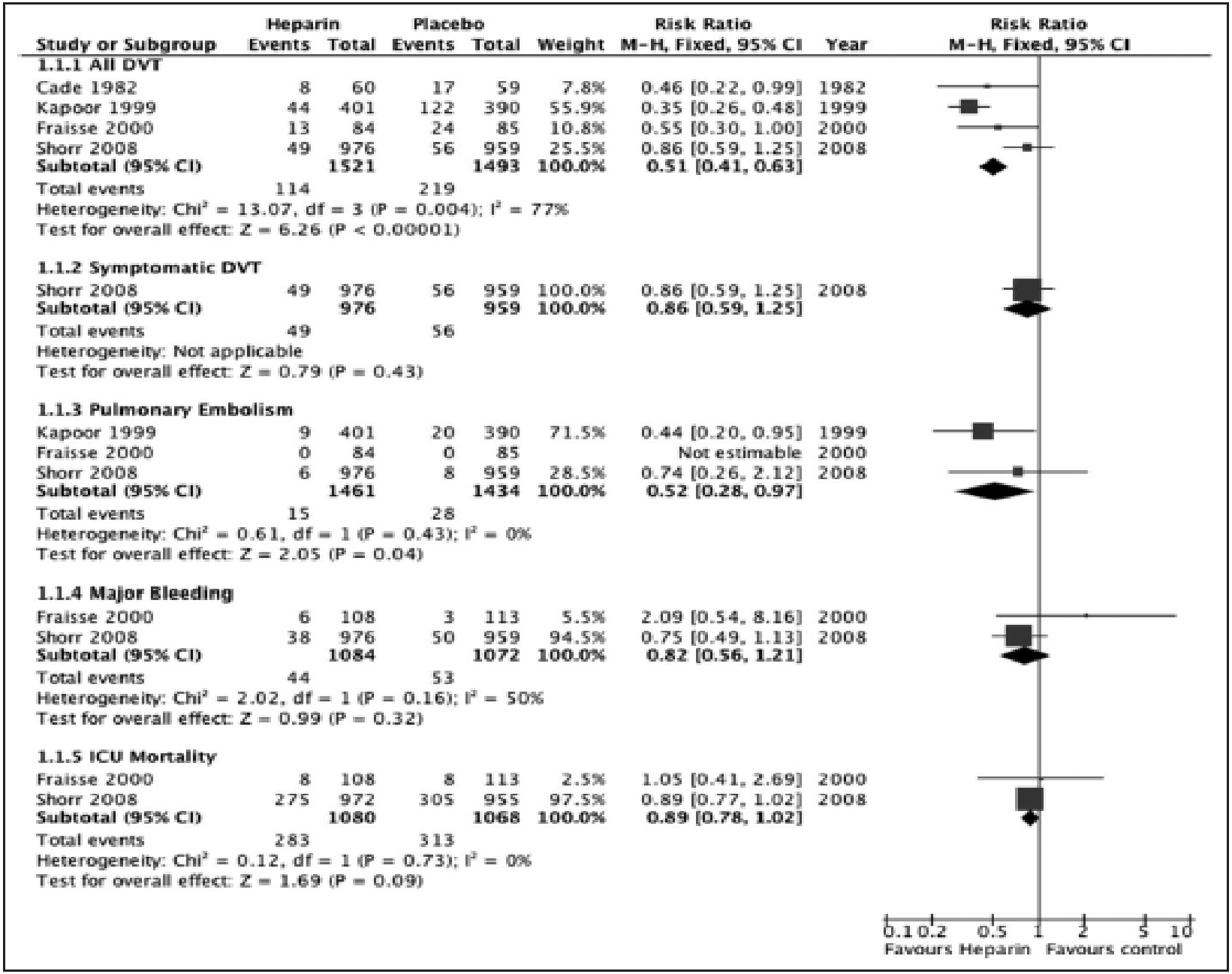

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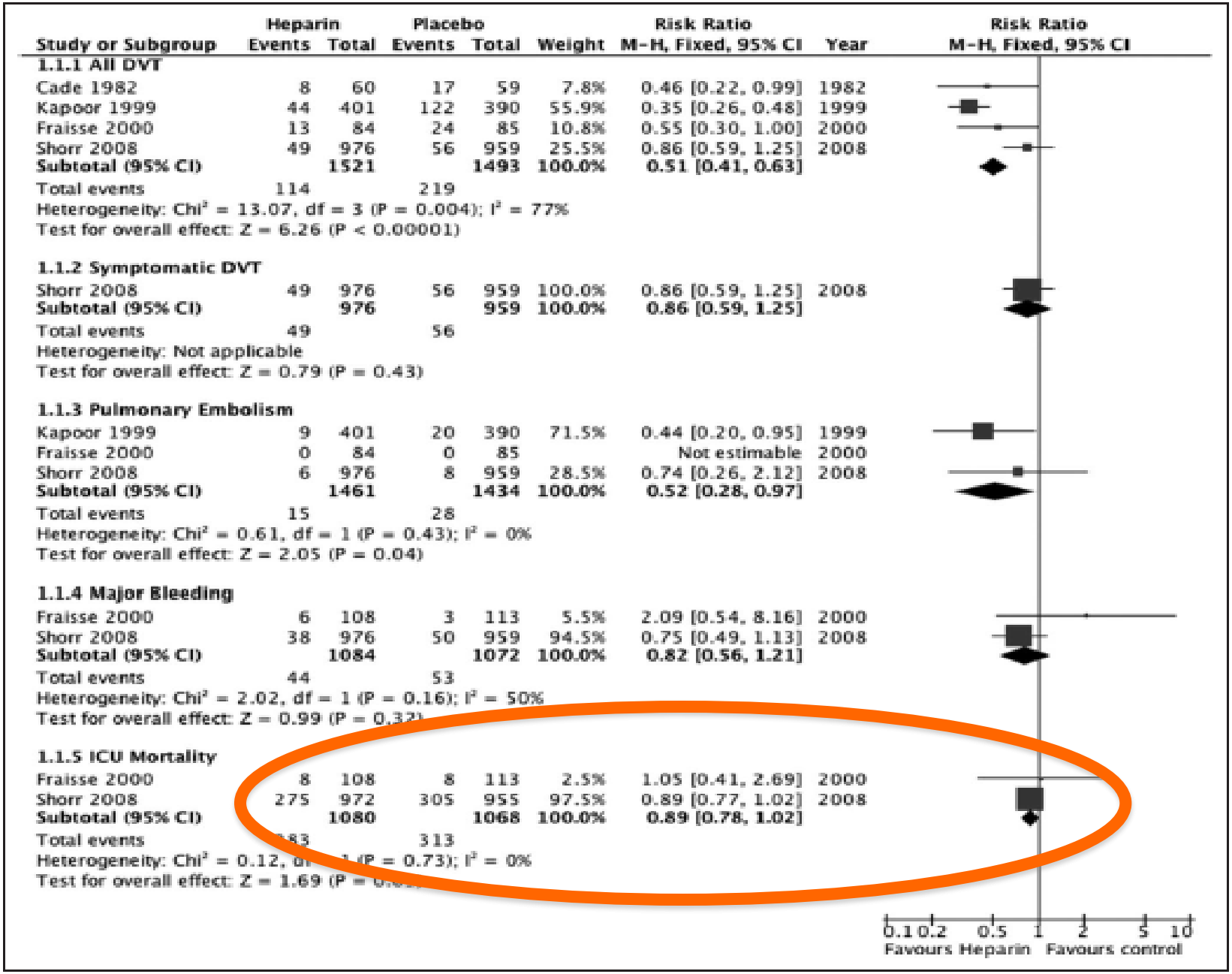
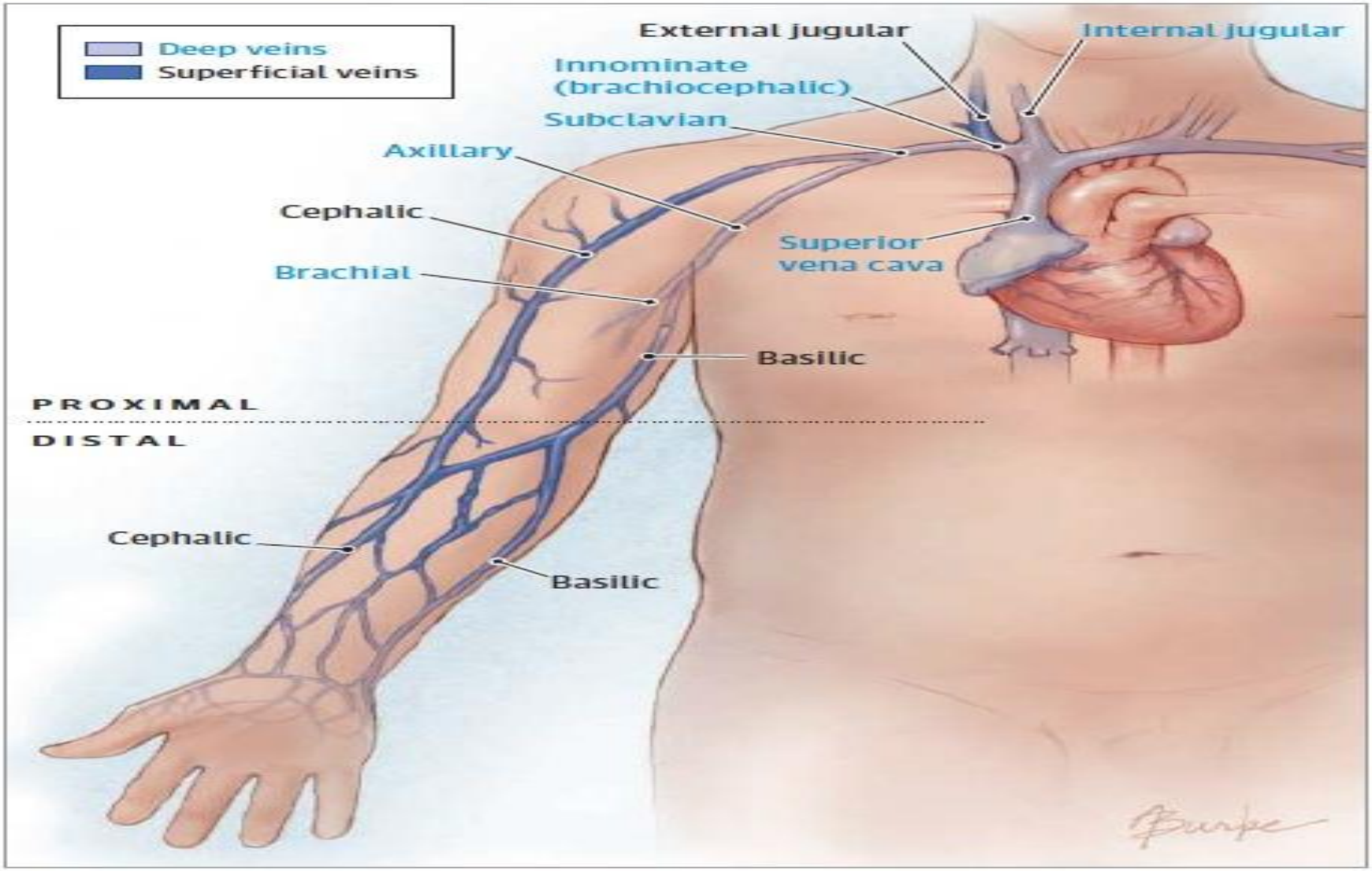


Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098

Seulement aux membres inférieurs ?

Lamontagne F et al. JAMA 2014; online March 17

Figure. Reference Nomenclature for Upper-Extremity Venous Segments



This nomenclature is based on anatomy and reported ultrasonography results from the calibration exercise of the upper-extremity thromboses adjudication process.

Lamontagne F et al. JAMA 2014; online March 17

Seulement aux membres inférieurs ?

- Etude prospective
- Incidence des TVS et TVP autres qu'aux membres inférieurs
- Comparaison prophylaxie par dalteparin versus héparine standard
- 3746 patients hospitalisés dans 67 USI médico chirurgical pour minimum 3 jours

Lamontagne F et al. JAMA 2014; online March 17

Seulement aux membres inférieurs ?

- **Sur 3746 patients, 84 (2.2%) présentent une ou plusieurs thromboses veineuses (50/50 profonde versus superficielle).**

- **95 % de ces thromboses sont au niveau des membres supérieurs**

Lamontagne F et al. JAMA 2014; online March 17

Seulement aux membres inférieurs ?

Table 2. Factors Associated With Nonleg Venous Thromboses: Univariable Analysis[a]

	NLDVT in ICU		No NLDVT in ICU		
Characteristic/Factor	Patients, No.	Mean (SD) or No. (%)	Patients, No.	Mean (SD) or No. (%)	*P* Value
Baseline characteristics					
APACHE II score, mean (SD)	47	22.1 (8.5)	3678	21.5 (7.8)	.63
BMI, mean (SD)	46	28.3 (8.3)	3551	28.3 (7.7)	.97
Cancer, No. (%)	47	9 (19.1)	3680	366 (9.9)	.048
Time-dependent factors					
Vasopressors or inotropes ever, No. (%)	47	39 (83.0)	3677	2012 (54.7)	<.001
Statins ever, No. (%)	47	14 (29.8)	3677	748 (20.3)	.14

Abbreviations: APACHE, Acute Physiology and Chronic Health Evaluation; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); ICU, intensive care unit; NLDVT, nonleg deep vein thrombosis.

[a] In this table, we show characteristics of patients with and without NLDVT. Only incident NLDVTs diagnosed in the ICU were included. We defined malignancy as any history of cancer in the last 5 years. Risk factors are expressed as means and standard deviations for continuous variables and number and proportions for dichotomous variables. Statistical comparisons were conducted using a *t* test or Fisher exact test, respectively.

Lamontagne F et al. JAMA 2014; online March 17

Seulement aux membres inférieurs ?

Table 3. Factors Associated With Incident NLDVT: Multivariable Regression[a]

Characteristic/Factor	Adjusted Hazard Ratio (95% CI)	*P* Value
Baseline characteristics		
APACHE II score (10-point increase)	0.88 (0.60-1.30)	.53
BMI (10-point increase)	1.02 (0.71-1.47)	.90
Cancer	2.22 (1.06-4.65)	.03
Time-dependent factors		
Vasopressors or inotropes	1.24 (0.66-2.31)	.51
Statins	1.32 (0.65-2.68)	.44

Lamontagne F et al. JAMA 2014; online March 17

Seulement aux membres inférieurs ?

Les patients présentant une thrombose ont:

- **plus de risque d'avoir une embolie pulmonaire :**
  (14.9 vs 1.9 %; p < 0.001).
- **un séjour USI plus long :**
  19 (10-33) vs 9 (6-15) jours; p < 0.001
- **un séjour hospitalier plus long :**
  40 (23-79) vs 21 (13-39) jours; p < 0.001

Lamontagne F et al. JAMA 2014; online March 17

2. Quel type d’anticoagulation ?

2. Quel type d'anticoagulation ?

- ✓ Héparine de bas poids moléculaire
- ✓ Héparine non fractionnée 2 à 3/j
- ✓ Fondaparinux
- ✓ Antagoniste vitamine K
- ✓ Dabigatran
- ✓ Apixaban
- ✓ Rivaroxaban
- ✓ Aspirine

GRADE 1 B

Falck-Ytter Y et al. Chest 2012; 141: 278 S-325 S

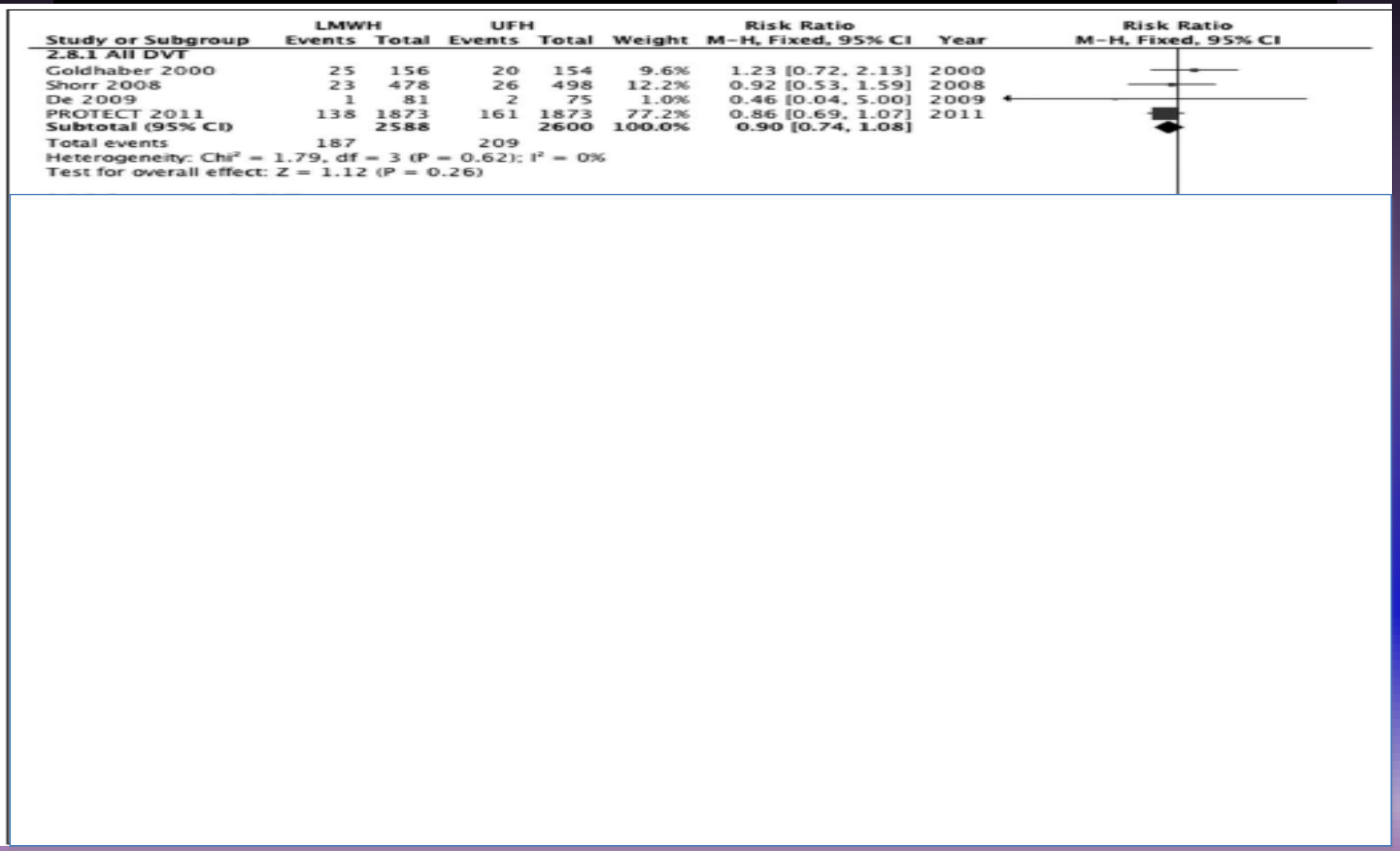
Comparaison HBPM vs HNF

Héparine **B**as **P**oids **M**oléculaire

Héparine **N**on **F**ractionnée

Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098

Comparaison HBPM vs HNF



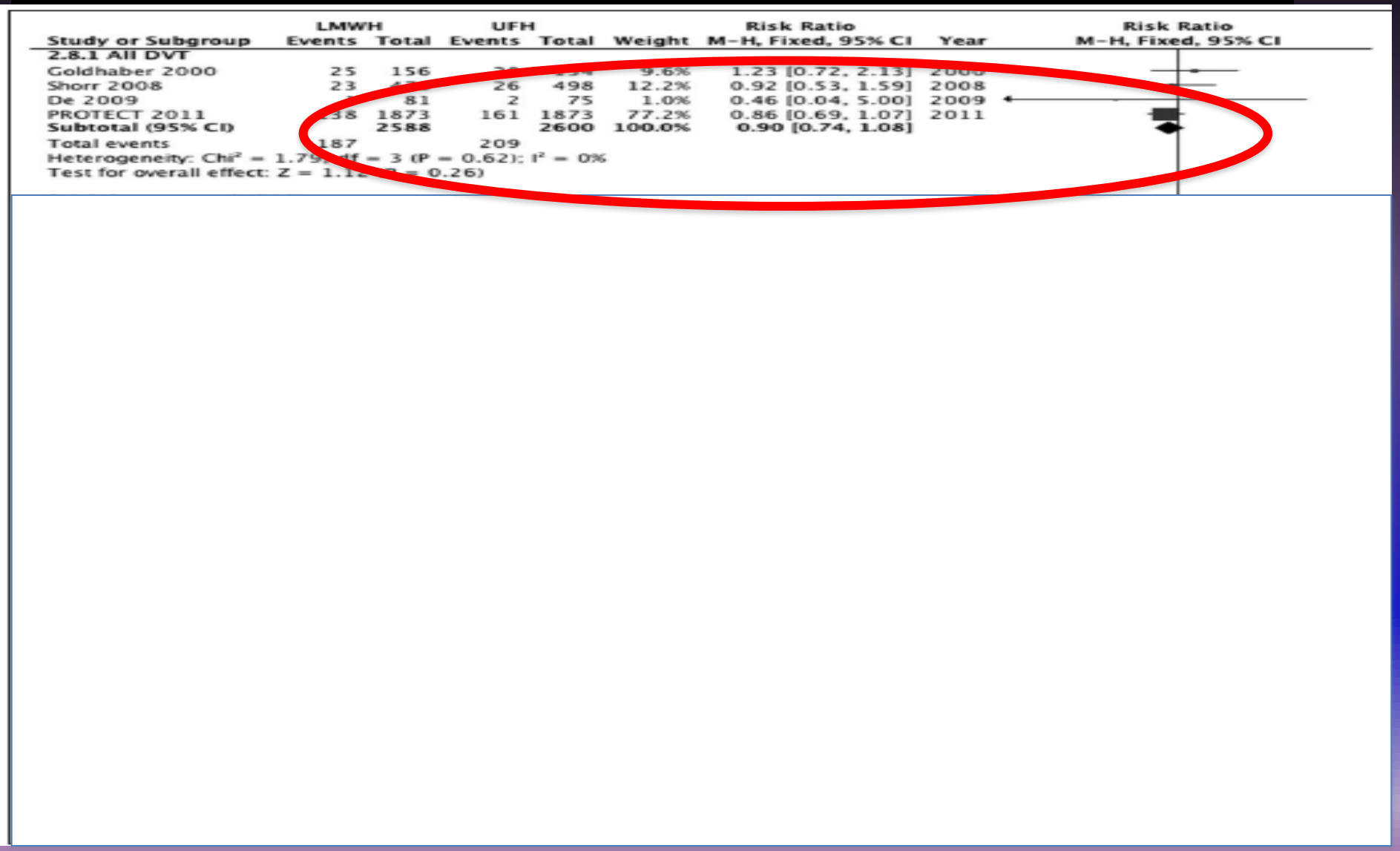
Study or Subgroup	LMWH Events	LMWH Total	UFH Events	UFH Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year	Risk Ratio M-H, Fixed, 95% CI
2.8.1 All DVT								
Goldhaber 2000	25	156	20	154	9.6%	1.23 [0.72, 2.13]	2000	
Shorr 2008	23	478	26	498	12.2%	0.92 [0.53, 1.59]	2008	
De 2009	1	81	2	75	1.0%	0.46 [0.04, 5.00]	2009	
PROTECT 2011	138	1873	161	1873	77.2%	0.86 [0.69, 1.07]	2011	
Subtotal (95% CI)		**2588**		**2600**	**100.0%**	**0.90 [0.74, 1.08]**		
Total events	187		209					

Heterogeneity: $Chi^2 = 1.79$, $df = 3$ ($P = 0.62$); $I^2 = 0\%$

Test for overall effect: $Z = 1.12$ ($P = 0.26$)

Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098

Comparaison HBPM vs HNF



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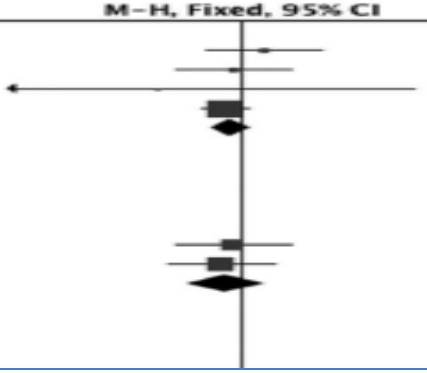
2.8.2 Symptomatic DVT								
Shorr 2008	23	478	26	498	42.8%	0.92 [0.53, 1.59]	2008	
PROTECT 2011	28	1873	34	1873	57.2%	0.82 [0.50, 1.35]	2011	
Subtotal (95% CI)		**2351**		**2371**	**100.0%**	**0.87 [0.60, 1.25]**		
Total events	51		60					
Heterogeneity: $Chi^2 = 0.09$, $df = 1$ ($P = 0.77$); $I^2 = 0\%$								
Test for overall effect: $Z = 0.77$ ($P = 0.44$)								



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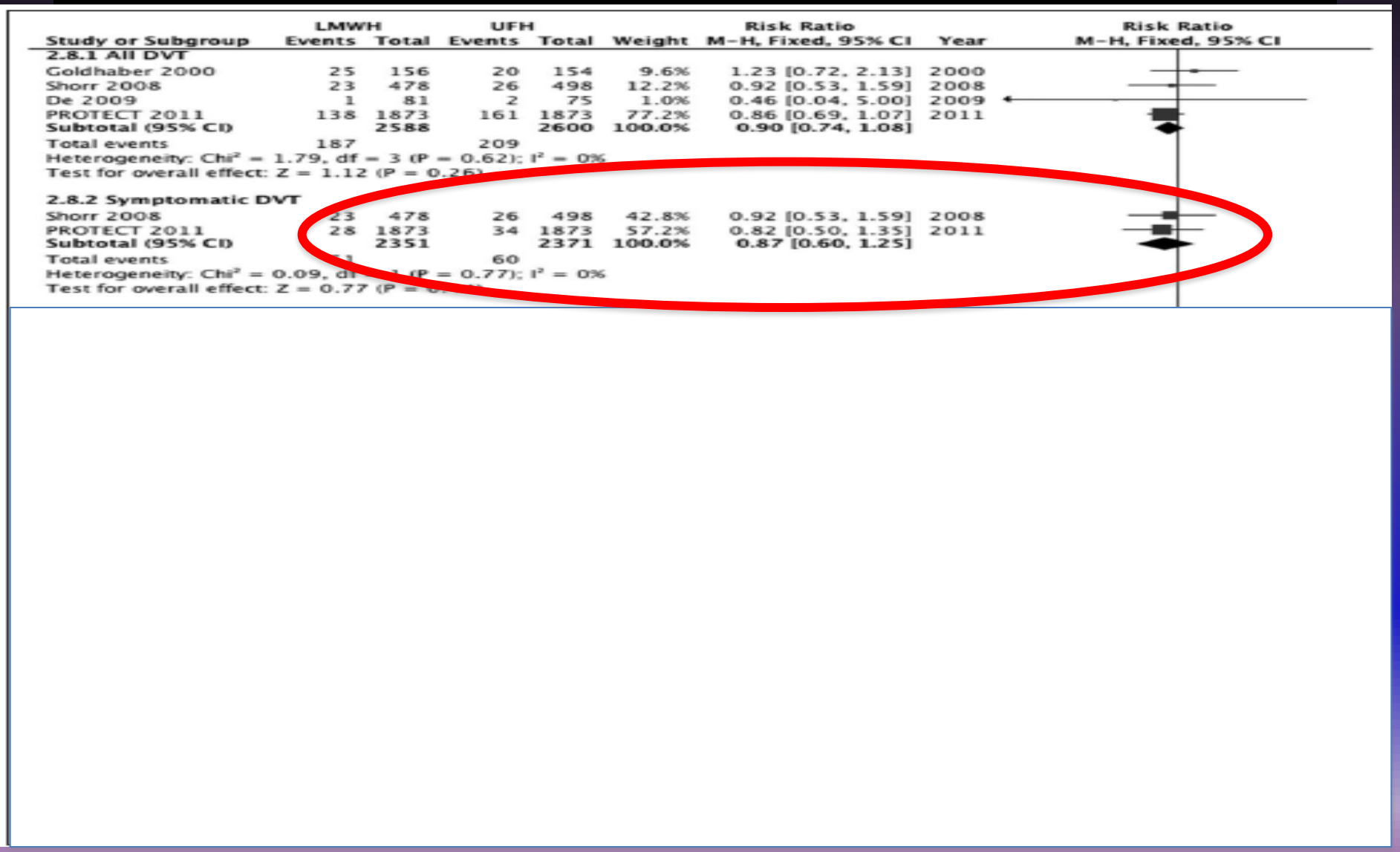

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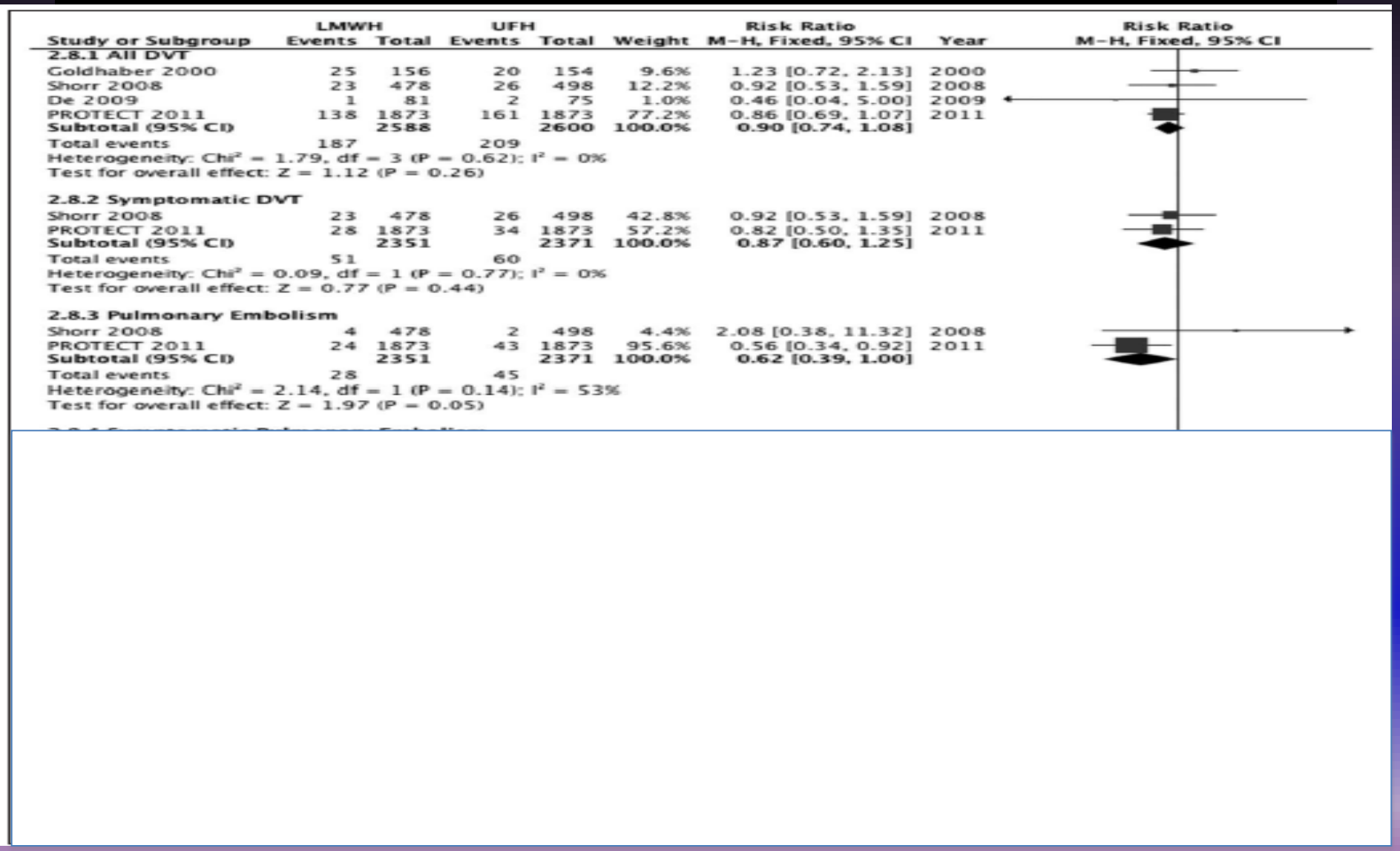
Alhazzani W et al. Crit Care Med 2013; 41: 2088–2098

Comparaison HBPM vs HNF



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Total events	51		60				
Heterogeneity: $Chi^2 = 0.09$, df = 1 (P = 0.77); $I^2 = 0\%$							
Test for overall effect: Z = 0.77 (P = 0.44)							
2.8.3 Pulmonary Embolism							
Shorr 2008	4	478	2	498	4.4%	2.08 [0.38, 11.32]	2008
PROTECT 2011	24	1873	43	1873	95.6%	0.56 [0.34, 0.92]	2011
Subtotal (95% CI)		**2351**		**2371**	**100.0%**	**0.62 [0.39, 1.00]**	
Total events	28		45				
Heterogeneity: $Chi^2 = 2.14$, df = 1 (P = 0.14); $I^2 = 53\%$							
Test for overall effect: Z = 1.97 (P = 0.05)							

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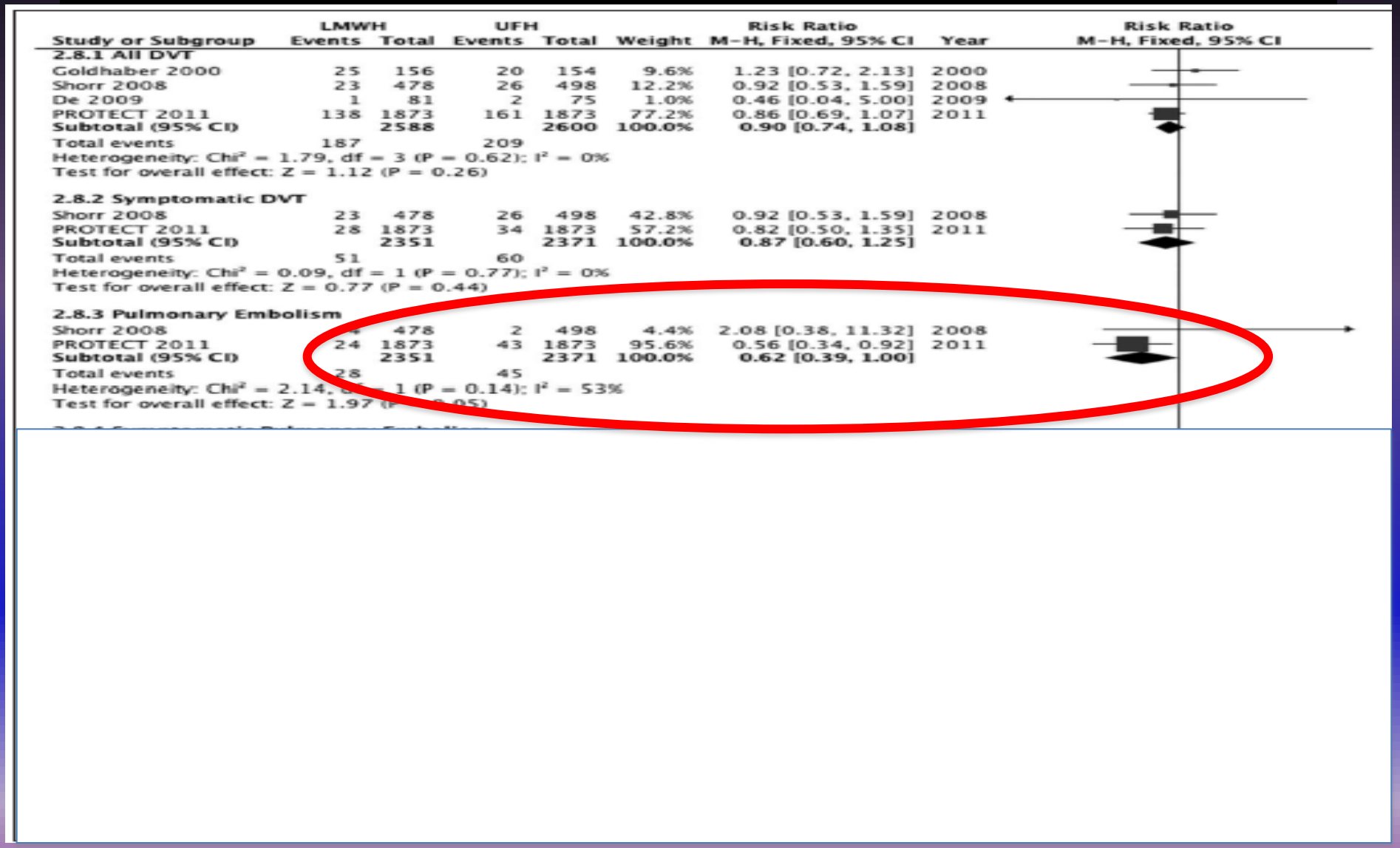
Comparaison HBPM vs HNF



Study or Subgroup	LMWH Events	LMWH Total	UFH Events	UFH Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year
2.8.1 All DVT							
Goldhaber 2000	25	156	20	154	9.6%	1.23 [0.72, 2.13]	2000
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PROTECT 2011	138	1873	161	1873	77.2%	0.86 [0.69, 1.07]	2011
Subtotal (95% CI)		**2588**		**2600**	**100.0%**	**0.90 [0.74, 1.08]**	
Total events	187		209				
Heterogeneity: Chi² = 1.79, df = 3 (P = 0.62); I² = 0%							
Test for overall effect: Z = 1.12 (P = 0.26)							
2.8.2 Symptomatic DVT							
Shorr 2008	23	478	26	498	42.8%	0.92 [0.53, 1.59]	2008
PROTECT 2011	28	1873	34	1873	57.2%	0.82 [0.50, 1.35]	2011
Subtotal (95% CI)		**2351**		**2371**	**100.0%**	**0.87 [0.60, 1.25]**	
Total events	51		60				
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Total events	28		45				
Heterogeneity: Chi² = 2.14, [illegible] 1 (P = 0.14); I² = 53%							
Test for overall effect: Z = 1.97 [illegible]							

Risk Ratio M-H, Fixed, 95% CI

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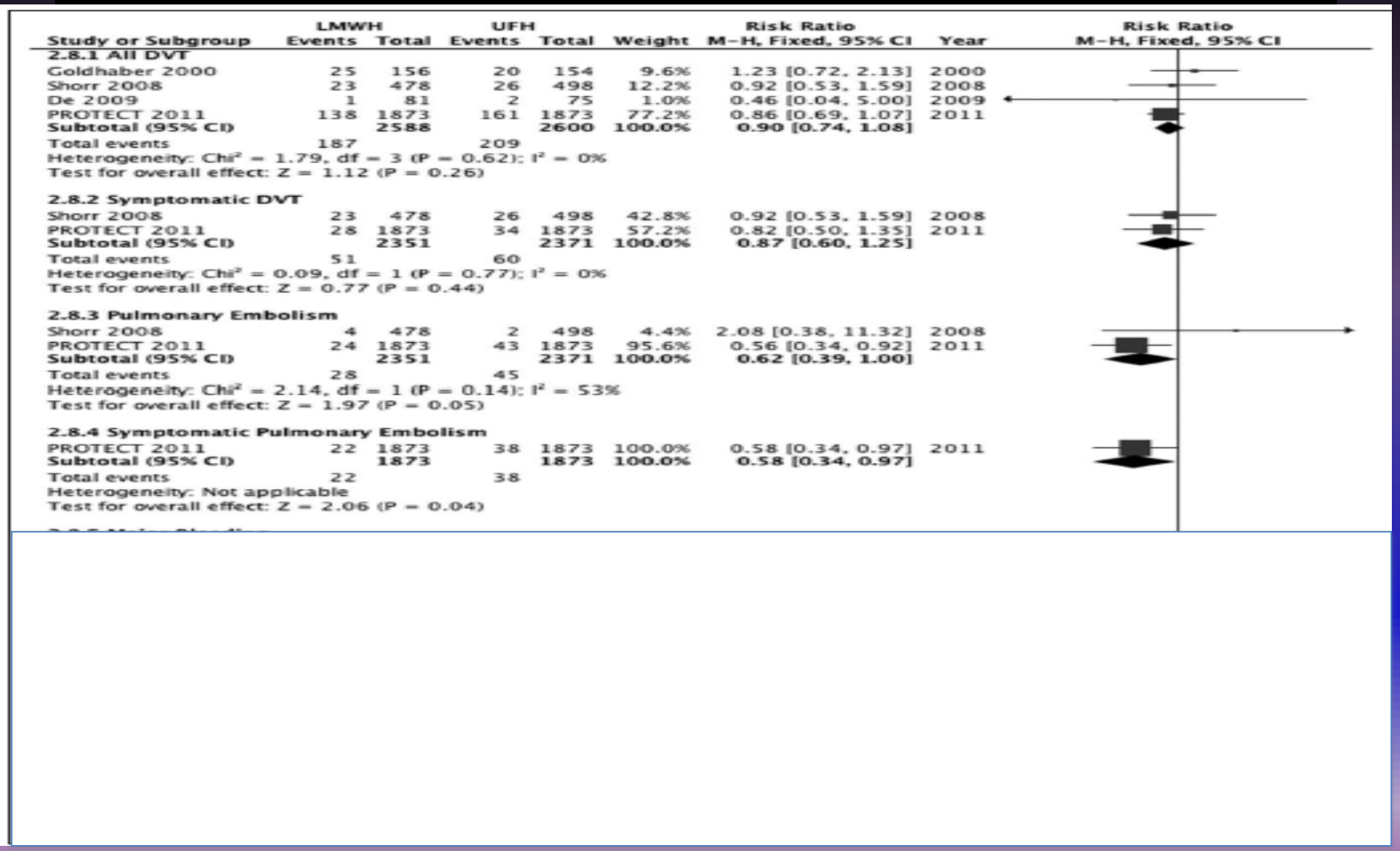
Comparaison HBPM vs HNF



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Total events	22		38				
Heterogeneity: Not applicable							
Test for overall effect: Z = 2.06 (P = 0.04)							

Risk Ratio M-H, Fixed, 95% CI

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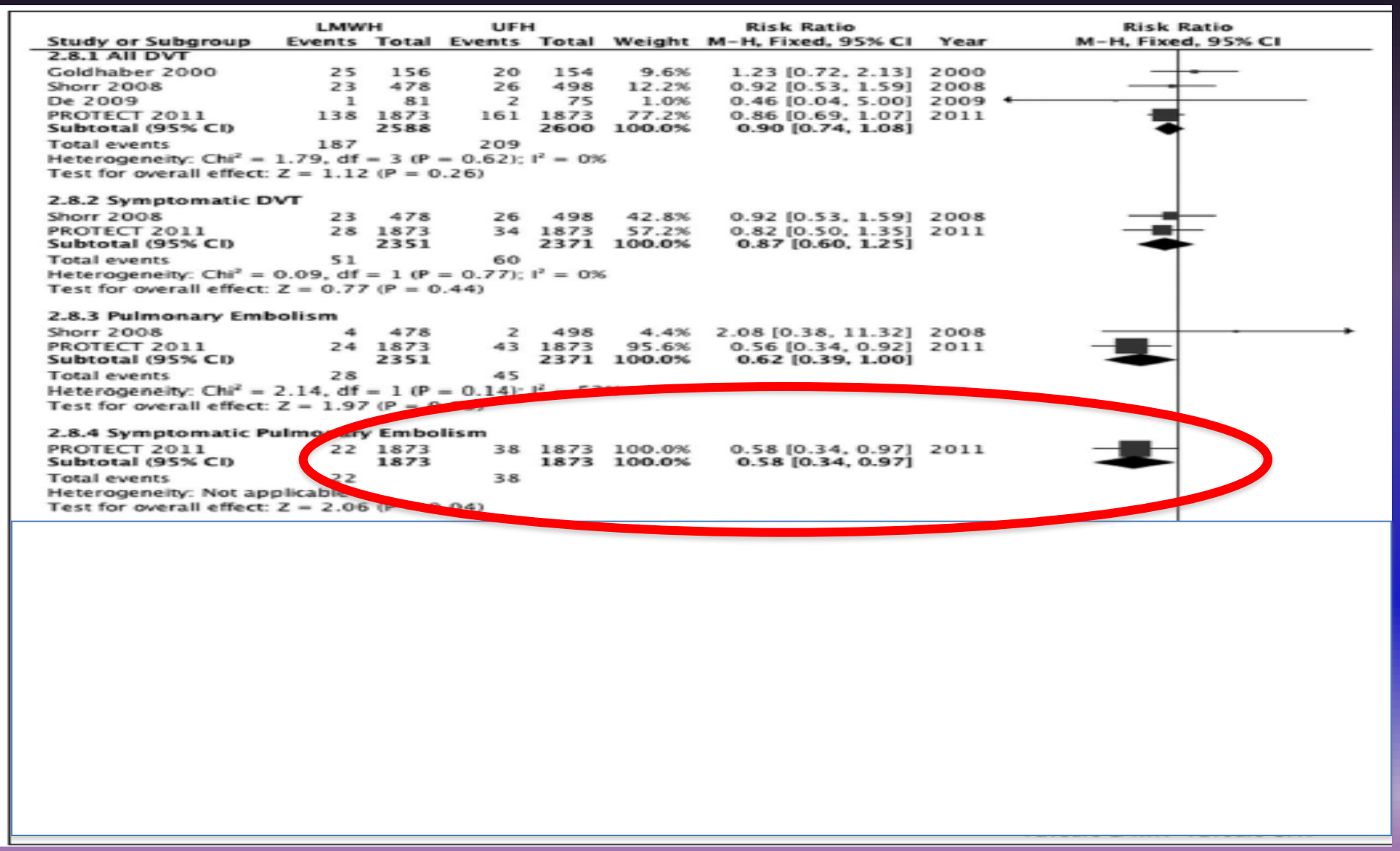
Comparaison HBPM vs HNF



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Test for overall effect: Z = 1.97 (P =								
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Total events	22		38					
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.06 (P = 0.04)								

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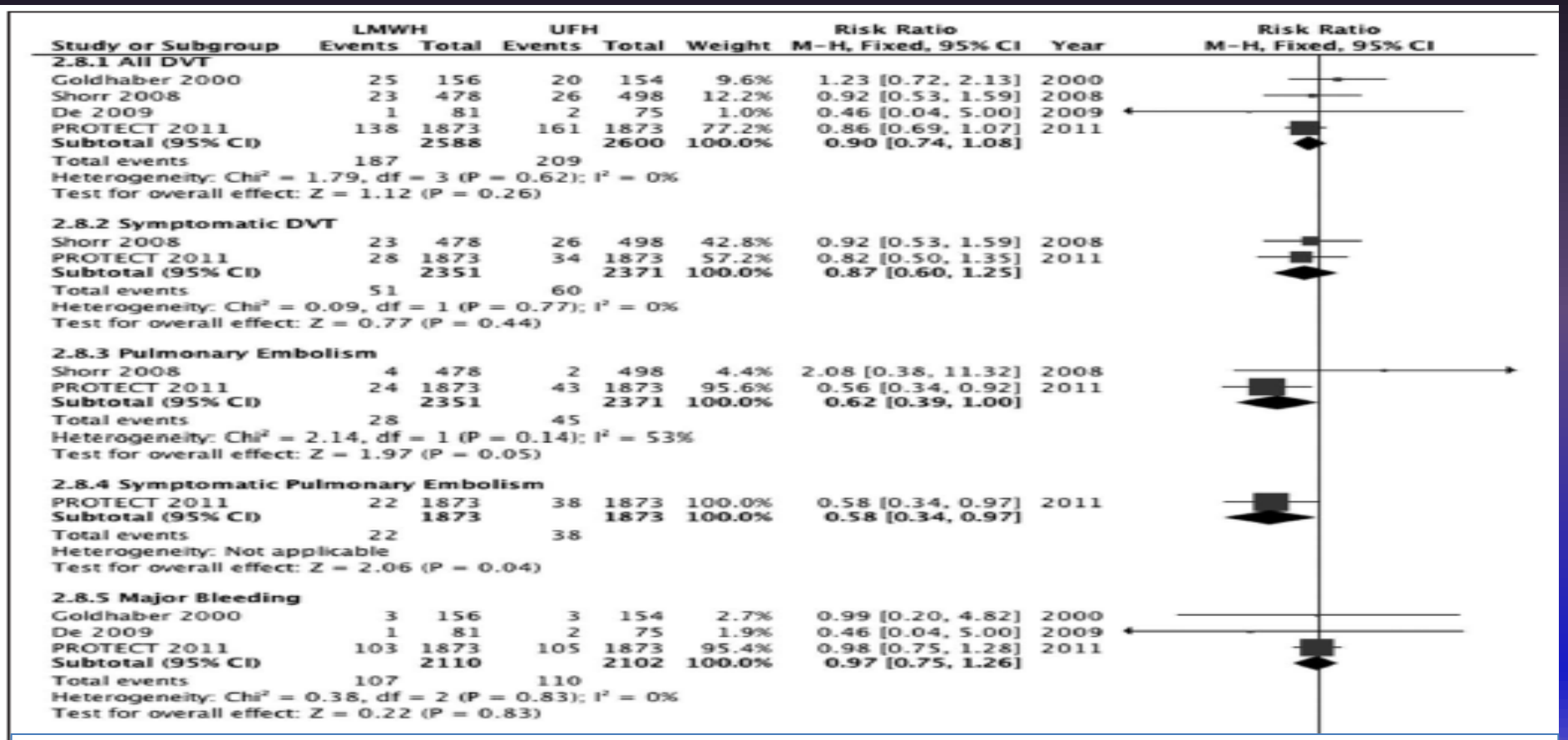
Comparaison HBPM vs HNF



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Heterogeneity: $Chi^2 = 2.14$, df = 1 (P = 0.14); $I^2 = 53\%$							
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2.8.4 Symptomatic Pulmonary Embolism							
PROTECT 2011	22	1873	38	1873	100.0%	0.58 [0.34, 0.97]	2011
Subtotal (95% CI)		**1873**		**1873**	**100.0%**	**0.58 [0.34, 0.97]**	
Total events	22		38				
Heterogeneity: Not applicable							
Test for overall effect: Z = 2.06 (P = 0.04)							
2.8.5 Major Bleeding							
Goldhaber 2000	3	156	3	154	2.7%	0.99 [0.20, 4.82]	2000
De 2009	1	81	2	75	1.9%	0.46 [0.04, 5.00]	2009
PROTECT 2011	103	1873	105	1873	95.4%	0.98 [0.75, 1.28]	2011
Subtotal (95% CI)		**2110**		**2102**	**100.0%**	**0.97 [0.75, 1.26]**	
Total events	107		110				
Heterogeneity: $Chi^2 = 0.38$, df = 2 (P = 0.83); $I^2 = 0\%$							
Test for overall effect: Z = 0.22 (P = 0.83)							

Risk Ratio M-H, Fixed, 95% CI

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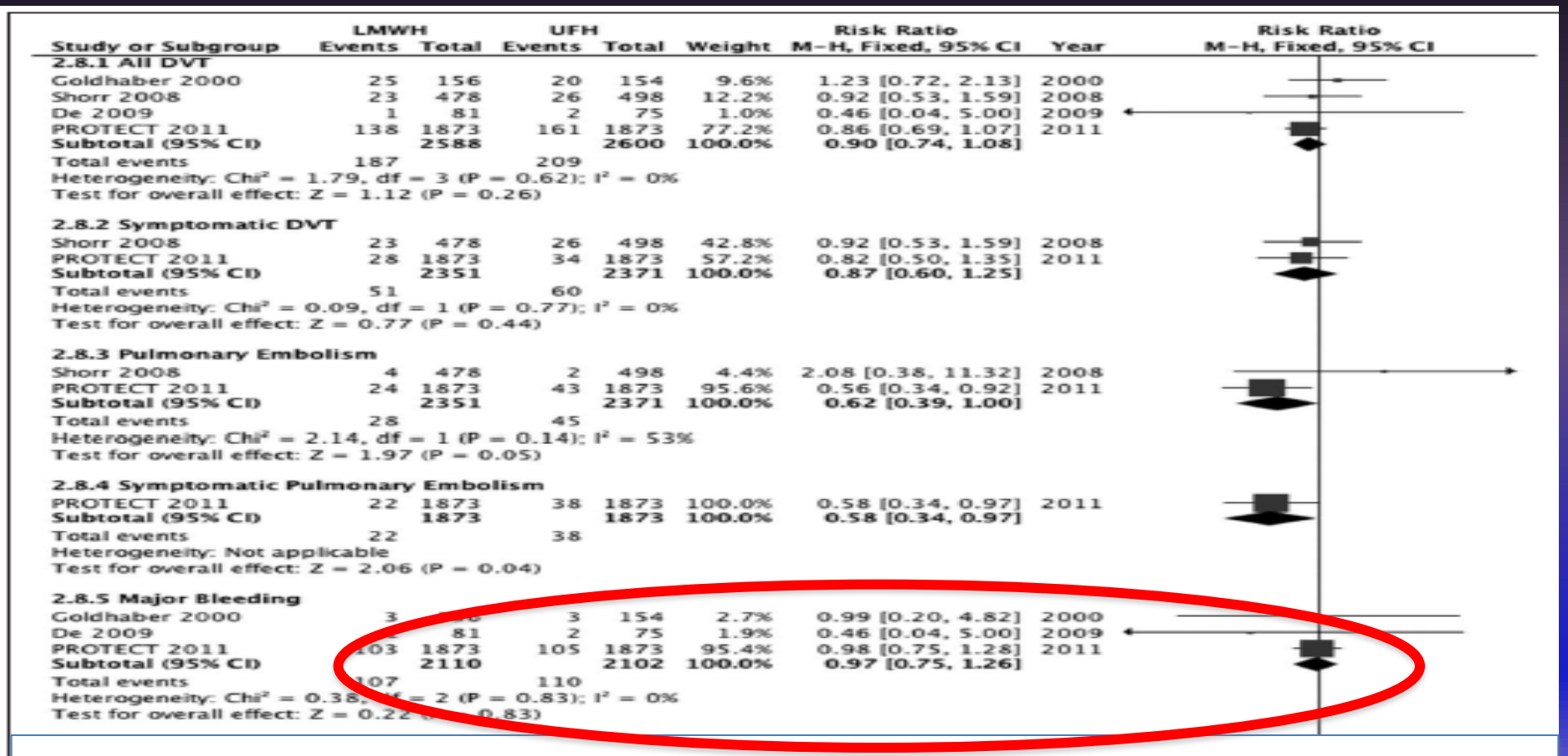
Comparaison HBPM vs HNF



Study or Subgroup	LMWH Events	LMWH Total	UFH Events	UFH Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year
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Subtotal (95% CI)		**2588**		**2600**	**100.0%**	**0.90 [0.74, 1.08]**	
Total events	187		209				
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Test for overall effect: Z = 1.97 (P = 0.05)							
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PROTECT 2011	22	1873	38	1873	100.0%	0.58 [0.34, 0.97]	2011
Subtotal (95% CI)		**1873**		**1873**	**100.0%**	**0.58 [0.34, 0.97]**	
Total events	22		38				
Heterogeneity: Not applicable							
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Goldhaber 2000	3	[illegible]	3	154	2.7%	0.99 [0.20, 4.82]	2000
De 2009	[illegible]	81	2	75	1.9%	0.46 [0.04, 5.00]	2009
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Total events	107		110				
Heterogeneity: $Chi^2 = 0.38$, [illegible] = 2 (P = 0.83); $I^2 = 0\%$							
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Risk Ratio M-H, Fixed, 95% CI

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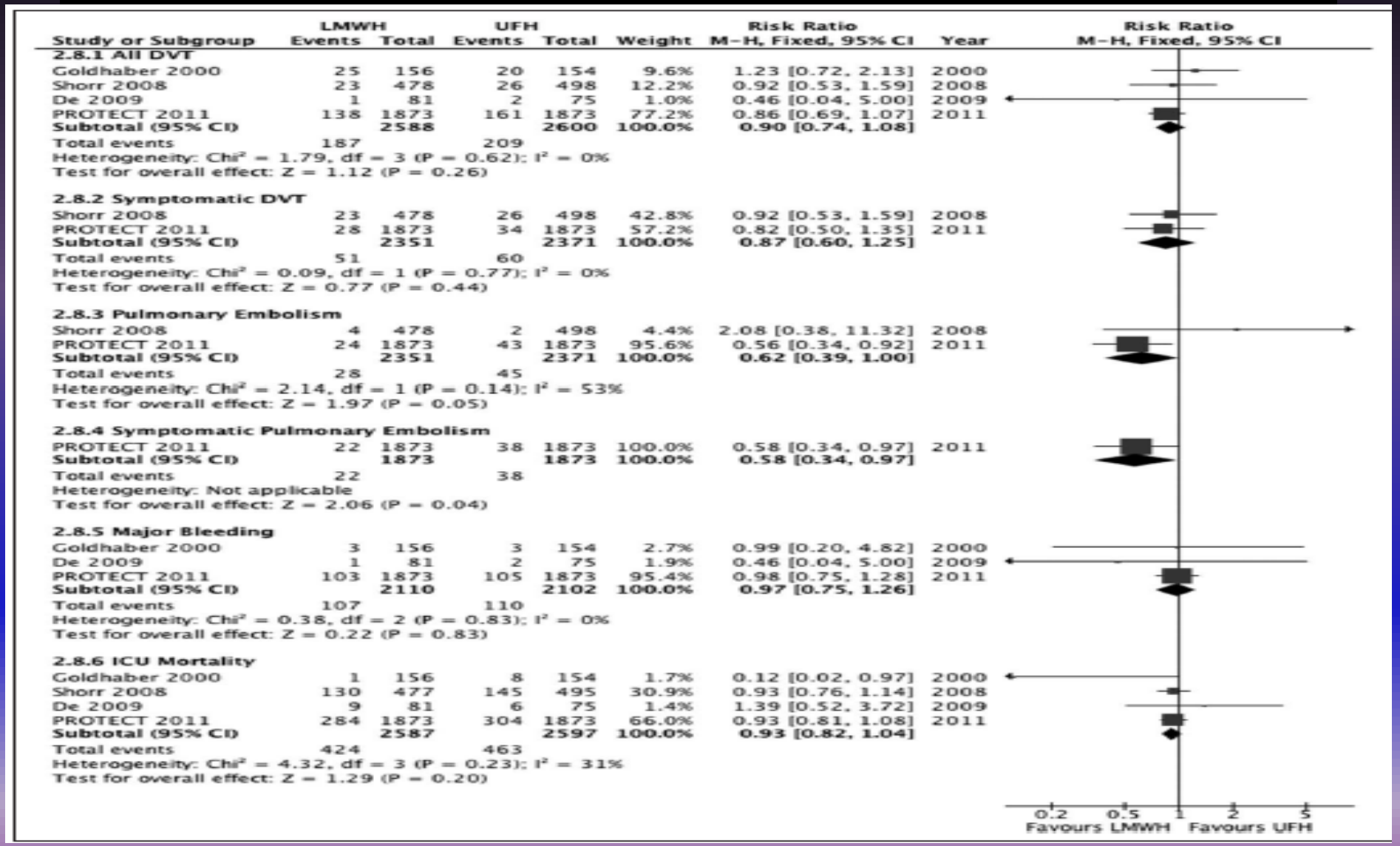
Comparaison HBPM vs HNF



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Total events	22		38				
Heterogeneity: Not applicable							
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Total events	107		110				
Heterogeneity: $Chi^2 = 0.38$, $df = 2$ ($P = 0.83$); $I^2 = 0\%$							
Test for overall effect: $Z = 0.22$ ($P = 0.83$)							
2.8.6 ICU Mortality							
Goldhaber 2000	1	156	8	154	1.7%	0.12 [0.02, 0.97]	2000
Shorr 2008	130	477	145	495	30.9%	0.93 [0.76, 1.14]	2008
De 2009	9	81	6	75	1.4%	1.39 [0.52, 3.72]	2009
PROTECT 2011	284	1873	304	1873	66.0%	0.93 [0.81, 1.08]	2011
Subtotal (95% CI)		**2587**		**2597**	**100.0%**	**0.93 [0.82, 1.04]**	
Total events	424		463				
Heterogeneity: $Chi^2 = 4.32$, $df = 3$ ($P = 0.23$); $I^2 = 31\%$							
Test for overall effect: $Z = 1.29$ ($P = 0.20$)							

Risk Ratio M-H, Fixed, 95% CI

0.2 0.5 1 2 5

Favours LMWH Favours UFH

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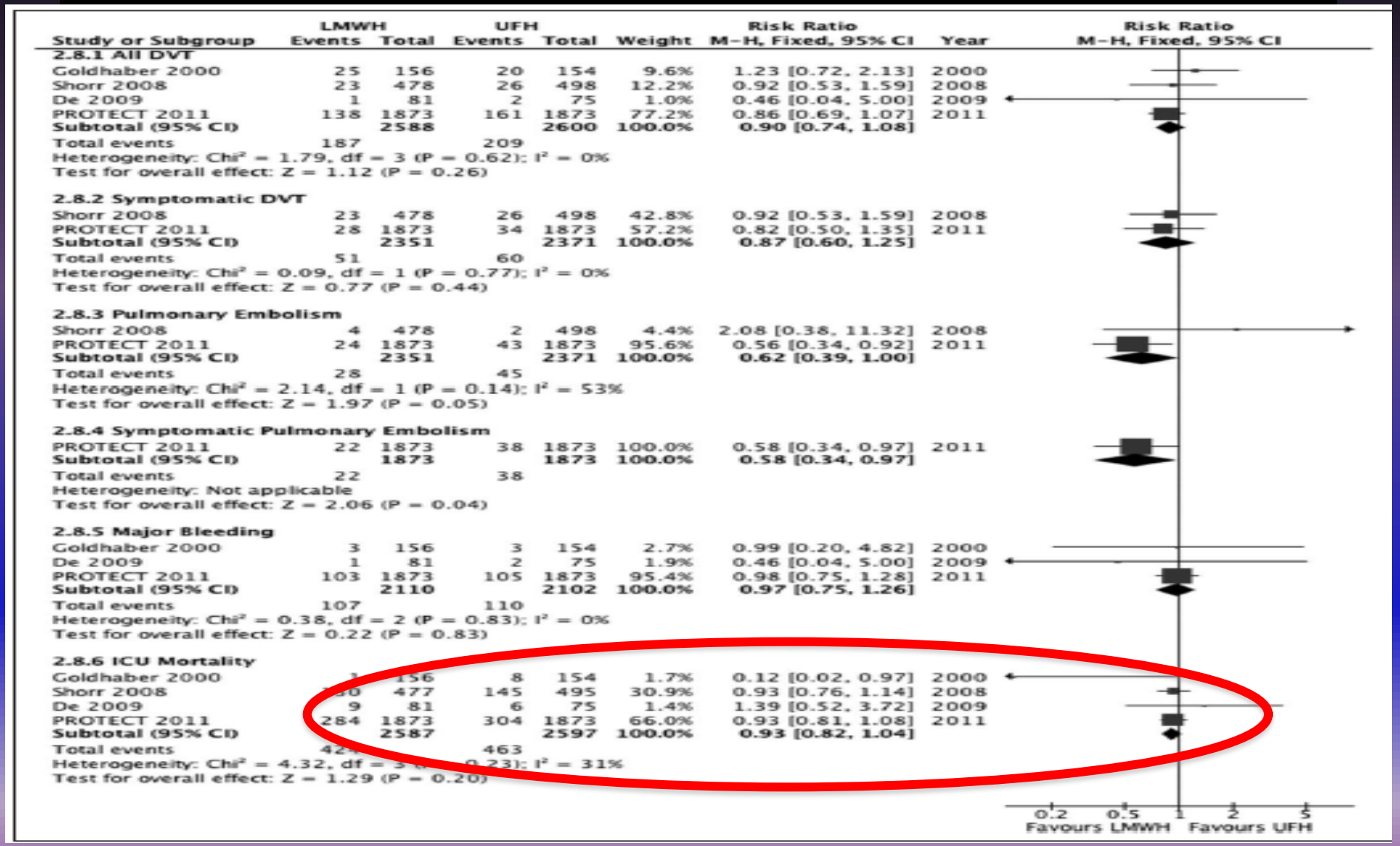
Comparaison HBPM vs HNF



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3. Thromboprophylaxie Pour qui?

Facteurs de risques aux soins intensifs

- Age : ≥ 40 ans
- Traumatisme majeur (surtout bassin, hanche, membres inférieurs)
- Chirurgie orthopédique hanche et / ou genou
- Chirurgie abdominale et pelvienne (cancer abdo)
- Chirurgie coronarienne
- Immobilisation prolongée : ≥ 5 jours
- ATCD de maladie thromboembolique

Score de risque

Table 2—*Risk Factors for VTE in Hospitalized Medical Patients*[9]

Risk Factor	Points
Active cancer[a]	3
Previous VTE (with the exclusion of superficial vein thrombosis)	3
Reduced mobility[b]	3
Already known thrombophilic condition[c]	3
Recent (≤ 1 mo) trauma and/or surgery	2
Elderly age (≥ 70 y)	1
Heart and/or respiratory failure	1
Acute myocardial infarction or ischemic stroke	1
Acute infection and/or rheumatologic disorder	1
Obesity (BMI ≥ 30)	1
Ongoing hormonal treatment	1

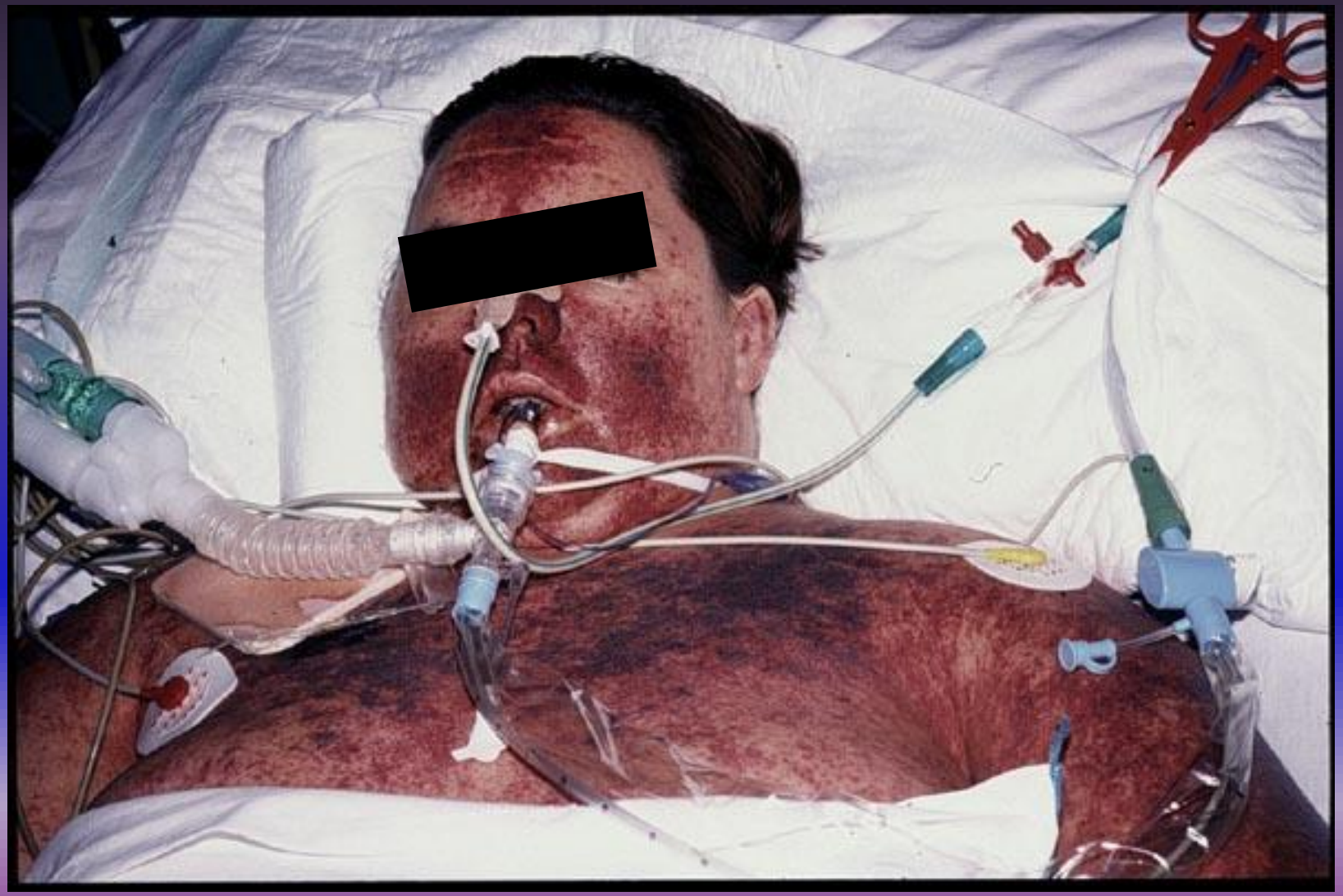
In the Padua Prediction Score risk assessment model, high risk of VTE is defined by a cumulative score ≥ 4 points. In a prospective observational study of 1,180 medical inpatients, 60.3% of patients were low risk and 39.7% were high risk. Among patients who did not receive prophylaxis, VTE occurred in 11.0% of high-risk patients vs 0.3% of low-risk patients (HR, 32.0; 95% CI, 4.1-251.0). Among high-risk patients, the risk of DVT was 6.7%, nonfatal PE 3.9%, and fatal PE 0.4%.[9] HR = hazard ratio.

[a]Patients with local or distant metastases and/or in whom chemotherapy or radiotherapy had been performed in the previous 6 mo.

[b]Anticipated bed rest with bathroom privileges (either because of patient's limitations or on physician's order) for at least 3 d.

[c]Carriage of defects of antithrombin, protein C or S, factor V Leiden, G20210A prothrombin mutation, antiphospholipid syndrome.

Kahn SR et al. Chest 2012; 141: 195 S-226 S



Patients médicaux

2.8. In acutely ill hospitalized medical patients who receive an initial course of thromboprophylaxis, we suggest against extending the duration of thromboprophylaxis beyond the period of patient immobilization or acute hospital stay (Grade 2B).

3.2. In critically ill patients, we suggest against routine ultrasound screening for DVT (Grade 2C).

3.4.3. For critically ill patients, we suggest using LMWH or LDUH thromboprophylaxis over no prophylaxis (Grade 2C).

3.4.4. For critically ill patients who are bleeding, or are at high risk for major bleeding, we suggest mechanical thromboprophylaxis with GCS (Grade 2C) **or IPC** (Grade 2C) **until the bleeding risk decreases, rather than no mechanical thromboprophylaxis. When bleeding risk decreases, we suggest that pharmacologic thromboprophylaxis be substituted for mechanical thromboprophylaxis** (Grade 2C).

Kahn SR et al. Chest 2012; 141: 195 S-226 S

Trauma

8.4.1. For major trauma patients, we suggest use of LDUH (Grade 2C), **LMWH** (Grade 2C), **or mechanical prophylaxis, preferably with IPC** (Grade 2C), **over no prophylaxis.**

8.4.2. For major trauma patients at high risk for VTE (including those with acute spinal cord injury, traumatic brain injury, and spinal surgery for trauma), we suggest adding mechanical prophylaxis to pharmacologic prophylaxis (Grade 2C) **when not contraindicated by lower-extremity injury.**

8.4.3. For major trauma patients in whom LMWH and LDUH are contraindicated, we suggest mechanical prophylaxis, preferably with IPC, over no prophylaxis (Grade 2C) **when not contraindicated by lower-extremity injury. We suggest adding pharmacologic prophylaxis with either LMWH or LDUH when the risk of bleeding diminishes or the contraindication to heparin resolves** (Grade 2C).

8.4.4. For major trauma patients, we suggest that an IVC filter should not be used for primary VTE prevention (Grade 2C).

8.4.5. For major trauma patients, we suggest that periodic surveillance with VCU should not be performed (Grade 2C).

Falck-Ytter Y et al. Chest 2012; 141: 278 S-325 S

Trauma

2.4. For patients undergoing major orthopedic surgery, we suggest extending thromboprophylaxis in the outpatient period for up to 35 days from the day of surgery rather than for only 10 to 14 days (Grade 2B).

2.5. In patients undergoing major orthopedic surgery, we suggest using dual prophylaxis with an antithrombotic agent and an IPCD during the hospital stay (Grade 2C).

Falck-Ytter Y et al. Chest 2012; 141: 278 S-325 S

Neurochirurgie

6.4.1. For craniotomy patients, we suggest that mechanical prophylaxis, preferably with IPC, be used over no prophylaxis (Grade 2C) **or pharmacologic prophylaxis** (Grade 2C).

6.4.2. For craniotomy patients at very high risk for VTE (eg, those undergoing craniotomy for malignant disease), we suggest adding pharmacologic prophylaxis to mechanical prophylaxis once adequate hemostasis is established and the risk of bleeding decreases (Grade 2C).

7.4.1. For patients undergoing spinal surgery, we suggest mechanical prophylaxis, preferably with IPC, over no prophylaxis (Grade 2C), **unfractionated heparin** (Grade 2C), **or LMWH** (Grade 2C).

7.4.2. For patients undergoing spinal surgery at high risk for VTE (including those with malignant disease or those undergoing surgery with a combined anterior-posterior approach), we suggest adding pharmacologic prophylaxis to mechanical prophylaxis once adequate hemostasis is established and the risk of bleeding decreases (Grade 2C).

Gould MK et al. Chest 2012; 141: 227 S-277 S

Chirurgie abdominale

3.6.5. For general and abdominal-pelvic surgery patients at high risk for VTE (~6.0%; Caprini score, ≥5) who are not at high risk for major bleeding complications, we recommend pharmacologic prophylaxis with LMWH (Grade 1B) **or LDUH** (Grade 1B) **over no prophylaxis. We suggest that mechanical prophylaxis with elastic stockings (ES) or IPC should be added to pharmacologic prophylaxis** (Grade 2C).

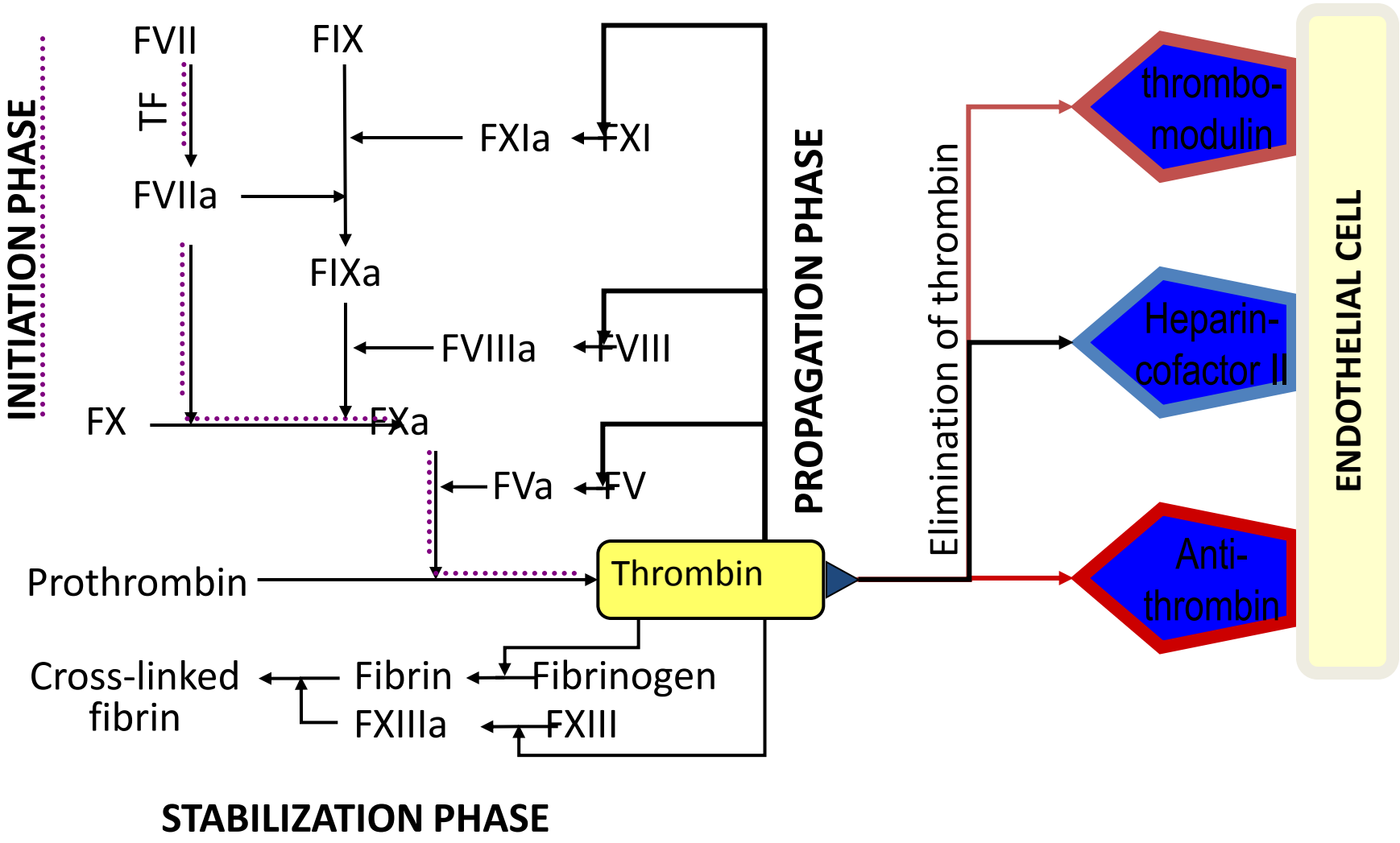
3.6.6. For high-VTE-risk patients undergoing abdominal or pelvic surgery for cancer who are not otherwise at high risk for major bleeding complications, we recommend extended-duration pharmacologic prophylaxis (4 weeks) with LMWH over limited-duration prophylaxis (Grade 1B).

Falck-Ytter Y et al. Chest 2012; 141: 227 S-277 S

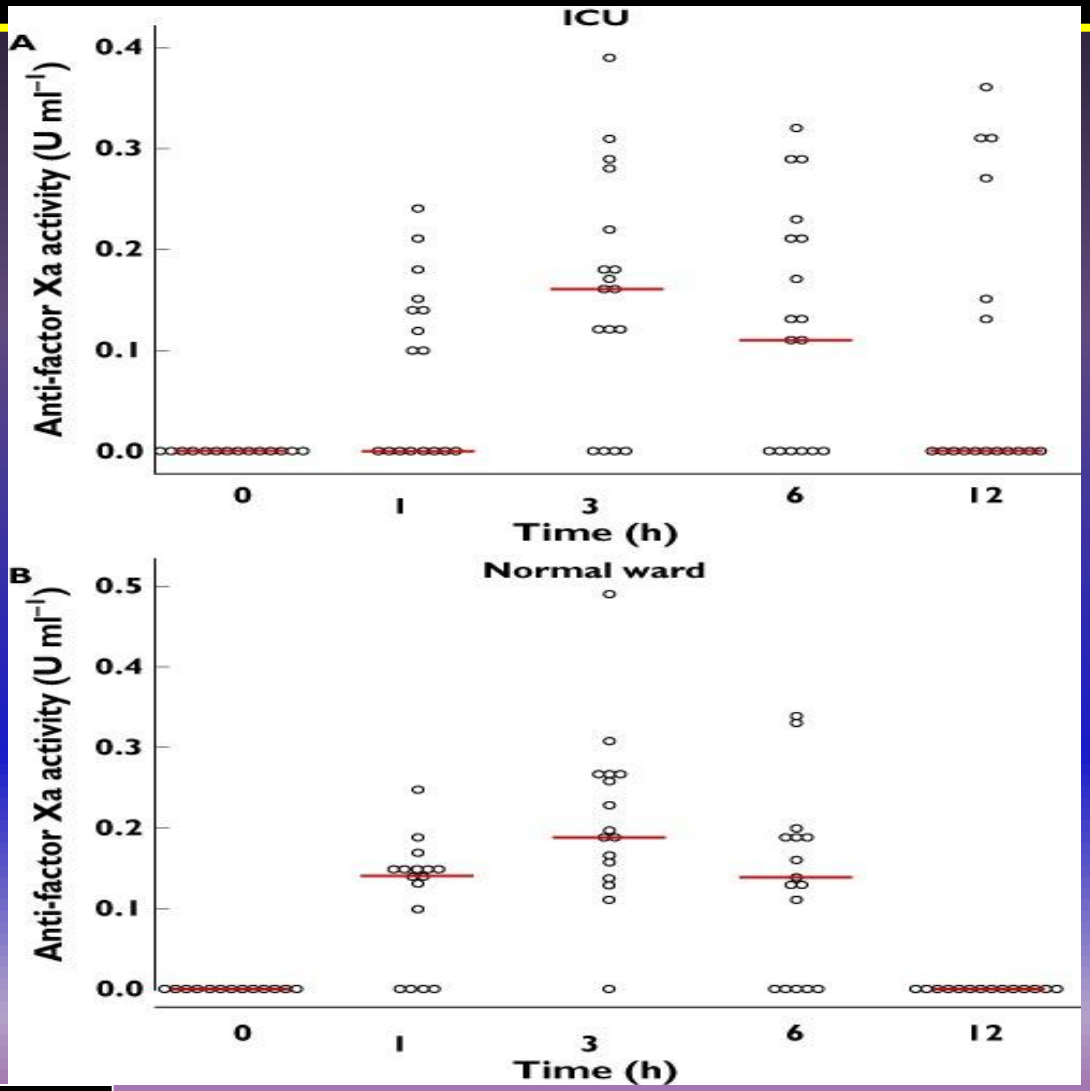
4. Est-ce que cela fonctionne ?

LMWH

THE CENTRAL ROLE OF THROMBIN



4. Est-ce que cela fonctionne ?



40 mg enoxaparin

Gouya G et al. Brit J Clin Pharmacol 2010; 74: 806-814

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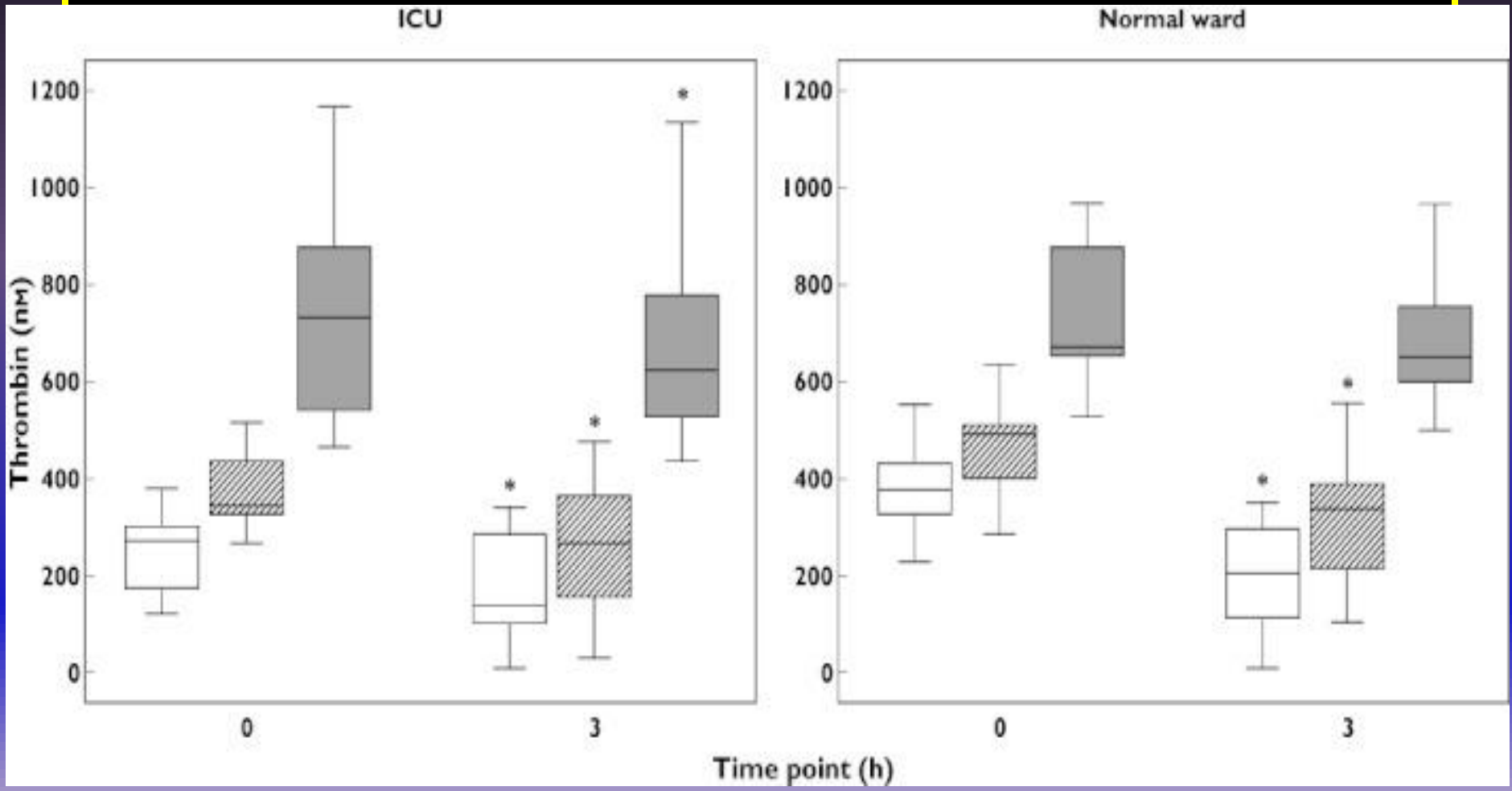
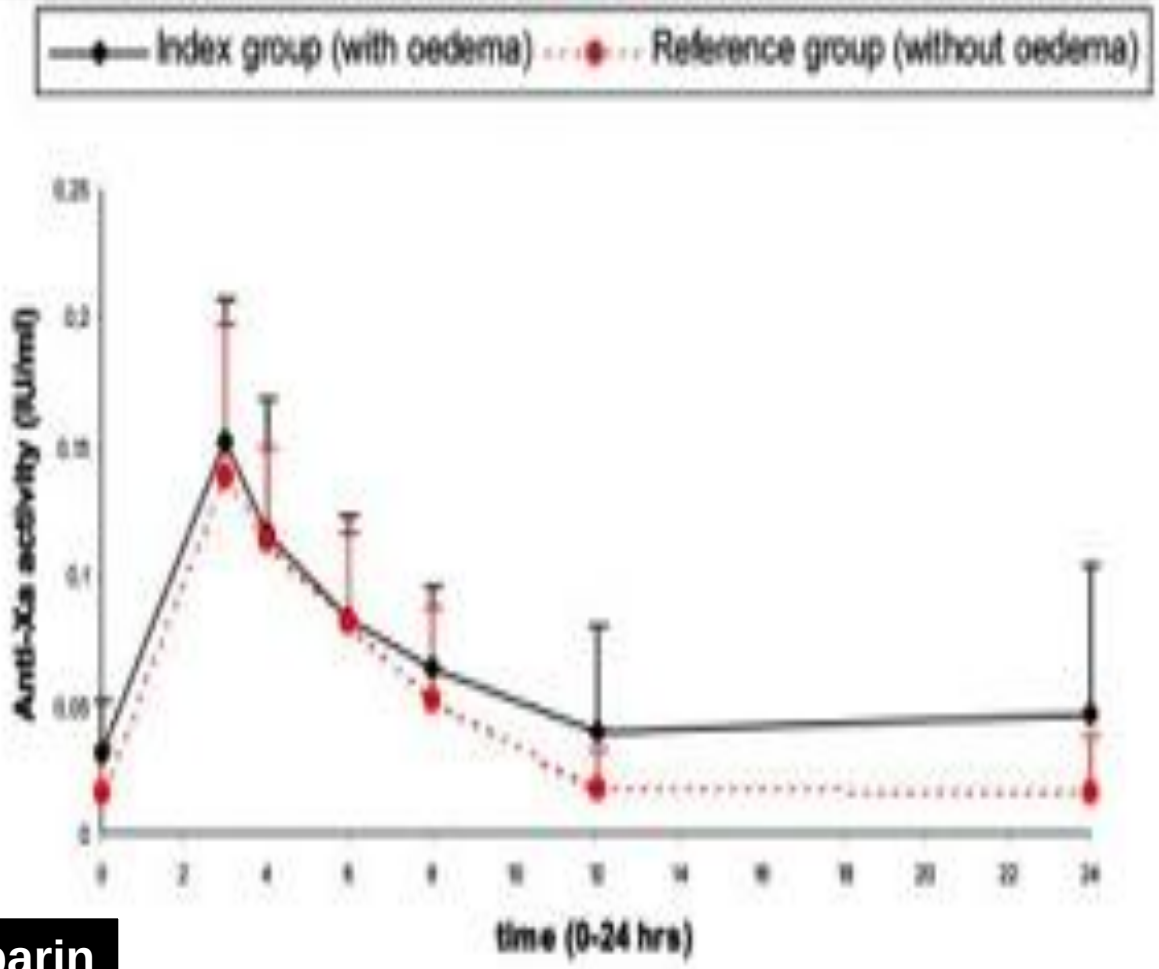


40 mg enoxaparin

Gouya G et al. Brit J Clin Pharmacol 2010; 74: 806-814

4. Est-ce que cela fonctionne ?

Même chez les patients oedematiés



2500 U Dalteparin

Rommes MJ et al. Crit Care 2006; 10: R 93

5. Thromboprophylaxie non médicamenteuse

PROPHYLAXIE MECANIQUE

- Moins étudiée que la prophylaxie médicamenteuse
- Beaucoup de petites études, biais cliniques
- Pas de normes d'utilisation (pression, taille…)
- Pas, voire peu d'essais cliniques pour les dispositifs mécaniques.
- Les effets sur l'EP et les décès inconnus (études trop petites)

Moyens mécaniques

- Bas de contention = passif
- Compression pneumatique intermittente = actif
- Mobilisation précoce = actif

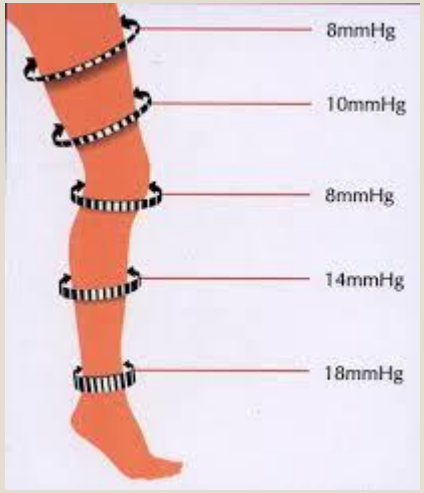
- *Hydratation*
  - *éviter viscosité du sang trop importante*

BAS DE CONTENTION

BAS DE CONTENTION
(GCS = graduated compression stockings)

- *Etude CLOTS 2009*

  - Patient AVC aigu / / 2518 patients inclus
  - Comparer **bas // sans bas**, 3 premiers jours, suivi à 30 jours
  - Diagnostic DVP par ultrasons
  - Analyse
    - Apparition DVP
    - Nombre de décès
    - Décès avec DVP
    - EP



Lancet 2009; 373: 1958–65

	Thigh-length GCS (n=1256)	Avoid GCS (n=1262)	Odds ratio (95% CI)
Primary outcome			
Proximal DVT	126 (10·0%)	133 (10·5%)	..
Alive and free of primary outcome	974 (77·5%)	1000 (79·2%)	..
Dead before any primary outcome	115 (9·2%)	101 (8·0%)	..
Missing	41 (3·3%)	28 (2·2%)	..
Unadjusted (dead and missing excluded)	..	..	0·97 (0·75-1·26)
Adjusted* (dead and missing excluded)	..	..	0·98 (0·76-1·27)
Secondary outcomes by 30 days or later second compression Doppler ultrasound			
Dead by 30 days	122 (9·7%)	110 (8·7%)	1·13 (0·86–1·48)
Symptomatic proximal DVT	36 (2·9%)	43 (3·4%)	0·84 (0·53–1·31)
Asymptomatic proximal DVT	90 (7·2%)	90 (7·1%)	1·01 (0·74–1·36)
Symptomatic DVT (proximal or distal)	55 (4·4%)	61 (4·8%)	0·90 (0·62–1·31)
Any DVT (proximal or distal)	205 (16·3%)	224 (17·7%)	0·90 (0·73–1·11)
PE confirmed on imaging or autopsy	13 (1·0%)	20 (1·6%)	0·65 (0·32–1·31)
PE on autopsy	1 (0·1%)	1 (0·1%)	1·00 (0·06–16·08)
Any DVT or PE	213 (17·0%)	232 (18·4%)	0·91 (0·74–1·11)
Skin breaks/ulcers/blisters/skin necrosis	64 (5·1%)	16 (1·3%)	4·18 (2·40–7·27)
Lower limb ischaemia/amputation	7 (0·6%)	2 (0·2%)	3·53 (0·73–17·03)
Primary outcomes within 14 days			
Post-hoc analysis restricting follow-up to 14 days†	87 (6·9%)	95 (7·5%)	..
Unadjusted (dead and missing excluded)	..	..	0·95 (0·70–1·28)
Adjusted* (dead and missing excluded)	..	..	0·95 (0·70–1·29)

Data are number (%) unless otherwise indicated. GCS–graduated compression stockings. DVT–deep vein thrombosis. PE–pulmonary embolism. *Adjusted for delay from onset to randomisation, stroke severity, and leg strength at baseline. †Full compliance by 14 days was 79·4% compared with 73·1% by 30 days.

Table 2: **Primary and secondary outcomes**

	Thigh-length GCS (n=1256)	Avoid GCS (n=1262)	Odds ratio (95% CI)
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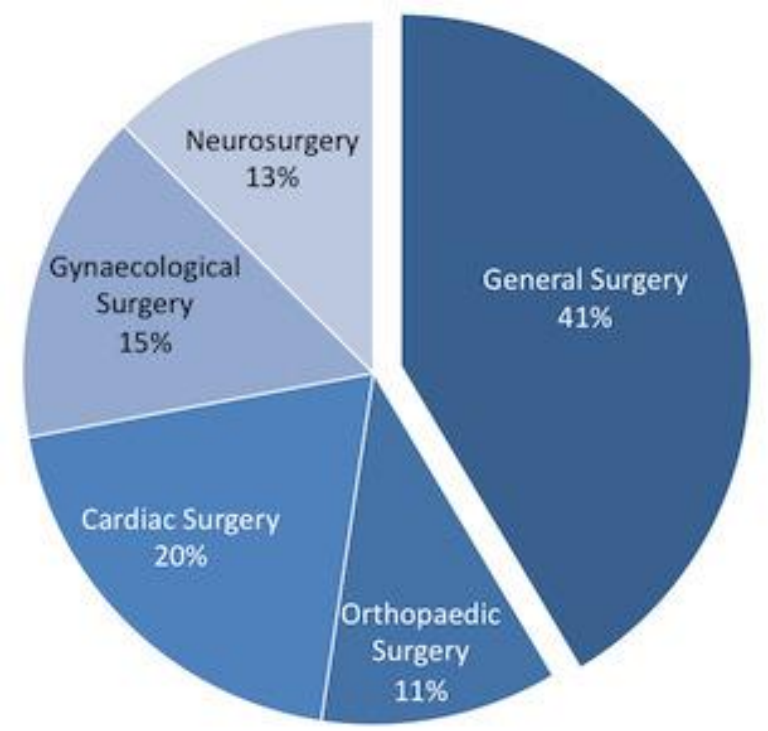
Table 2: **Primary and secondary outcomes**

Elastic compression stockings for prevention of deep vein thrombosis (Review)2010

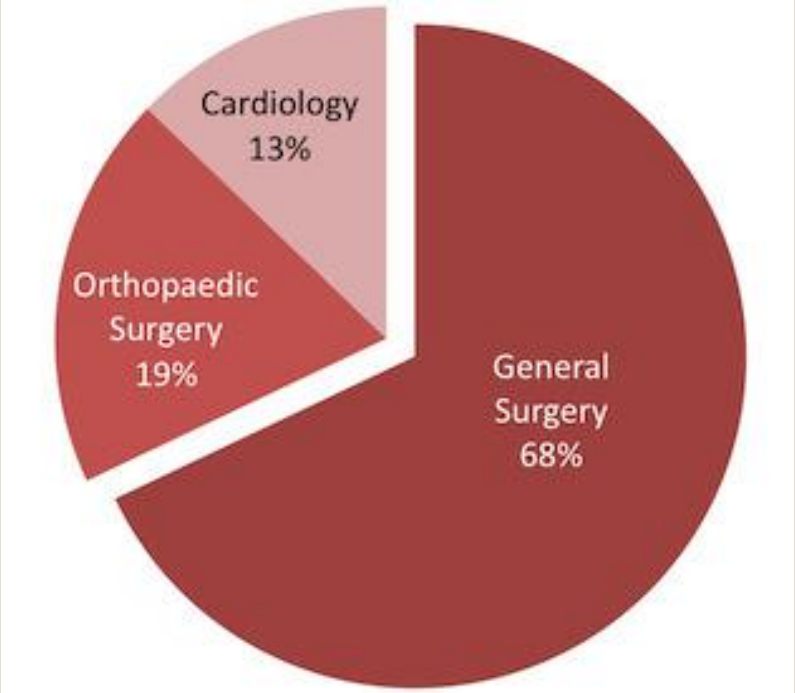
Group 1, eight RCTs provided 1279 analytic units (392 legs and 887 patients)

with stockings and without stockings



Group 2 10 RCTs providing 1248 analytic units (672 legs and 576 patients)

with stockings and without stockings on a background of additional antithrombotic measures



DIAGNOSTIC TVP

BAS	662	86	13%
SANS BAS	617	161	**26 %**
BAS + MEDIC	621	26	4%
MEDIC SEULE	627	99	**16 %**

- Bas diminue risque surtout en post opératoire
- Mais bas + médic plus efficace.

- *embolie pulmonaire*

  pas de différence significative dans les groupes de cette étude

Bas de contention =

- Peu de CI
  - *l'artériopathie oblitérante des membres inférieurs (AOMI)*
  - *la thrombose septique.*
  - *neuropathie périphérique évoluée*
  - *dermatose suintante ou eczématisée ;*
  - *Plaies, matériels….*

Semble améliorer la prévention des TVP

- Diminution de l'œdème des MI
- Importance de respecter les mensurations du patient (risque si trop grand ou trop petit)
- Réévaluer en fonction de la durée de séjour
- Peu de contrainte pour le patient et le personnel

Compression pneumatique

- La compression active évite ainsi la stagnation de sang veineux dans les membres inférieurs et impose un mouvement continu du sang veineux, ceci aidant à la prévention de la TVP.

- CONTRE-INDICATIONS
  - – Phlébite de jambe.
  - – Ulcère de jambe.
  - – Artérite des membres inférieurs graves.
  - – Insuffisance cardiaque congestive.
  - – Gangrène.
  - – Blessures infectées et non traitées.
  - – Greffe cutanée récente.
  - – Dermatite.

Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism in high-risk patients (Review)2008

- Poly-traumas ou après chirurgie
  N : 7432 P
- Age moyen : 65,5 ans
- <u>Comparaisons</u>
  - Compression seule
  - Compression avec traitement médicamenteux
  - Traitement seul

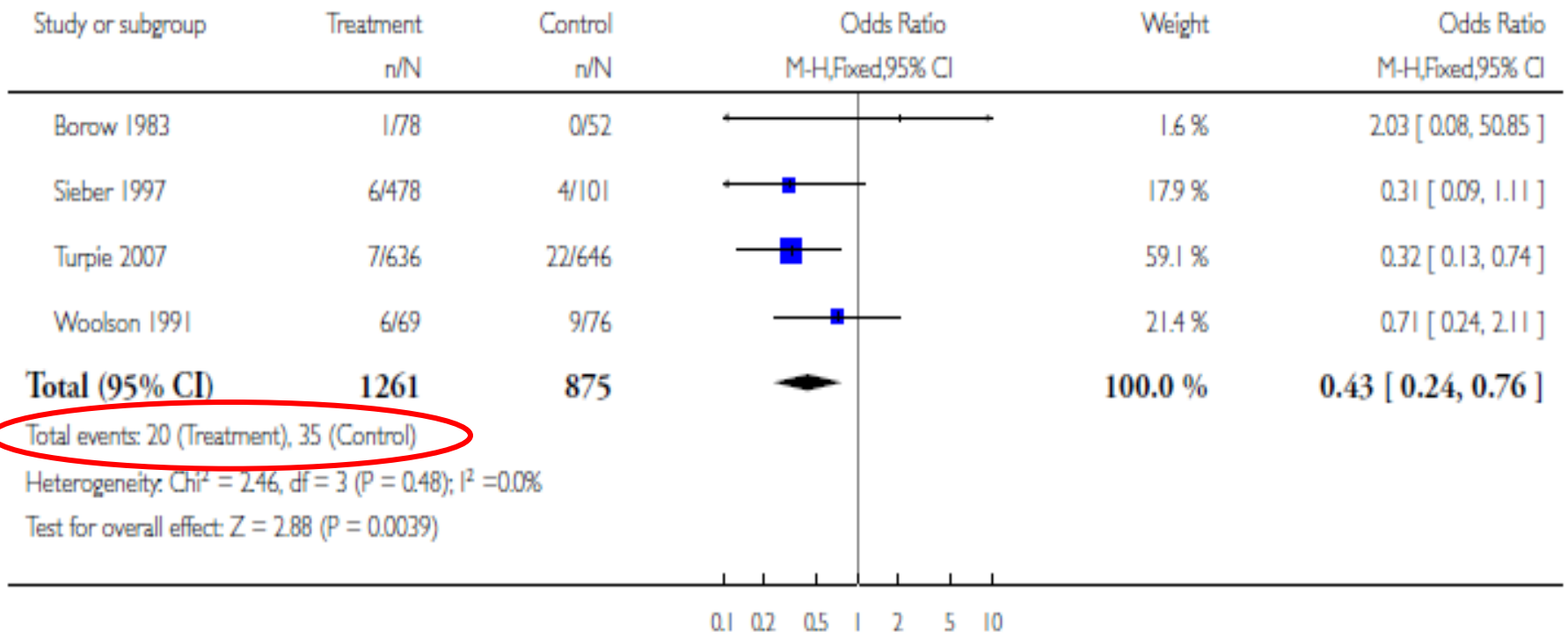
Pas de description; temps d'utilisation, fréquence et intensité

Analysis 1.2. Comparison 1 Compression + anticoagulant versus compression, Outcome 2 Incidence of DVT in the treatment and control groups.

Review: Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism in high-risk patients

Comparison: 1 Compression + anticoagulant versus compression

Outcome: 2 Incidence of DVT in the treatment and control groups



Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism in high-risk patients (Review) 2008

Analysis 1.1. Comparison 1 Compression + anticoagulant versus compression, Outcome 1 Incidence of PE in the treatment and control groups.

Review: Combined intermittent pneumatic leg compression and pharmacological prophylaxis for prevention of venous thromboembolism in high-risk patients

Comparison: 1 Compression + anticoagulant versus compression

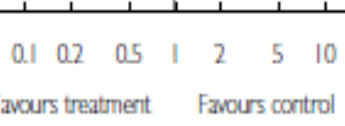
Outcome: 1 Incidence of PE in the treatment and control groups

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Odds Ratio M-H,Fixed,95% CI
Bigg 1992	0/32	4/36		0.11 [0.01, 2.15]
Borow 1983	0/78	0/52		0.0 [0.0, 0.0]
Ramos 1996	21/1355	48/1196		0.38 [0.22, 0.63]
Sieber 1997	5/478	0/101		2.36 [0.13, 42.98]
Turpie 2007	2/636	4/646		0.51 [0.09, 2.77]
Woolson 1991	0/69	0/76		0.0 [0.0, 0.0]
Total (95% CI)	**2648**	**2107**		**0.39 [0.25, 0.63]**

Total events: 28 (Treatment), 56 (Control)

Heterogeneity: $Chi^2 = 2.27$, $df = 3$ ($P = 0.52$); $I^2 = 0.0\%$

Test for overall effect: $Z = 3.90$ ($P = 0.000097$)



MOBILISATION PRECOCE

MOBILISATION PRECOCE

- La mobilisation est une activité physique suffisante pour provoquer des effets physiologiques qui stimulent la ventilation, la perfusion périphérique et centrale, la circulation, le métabolisme et l'état de conscience.
- Elle aide à prévenir la stase veineuse et la thrombose veineuse profonde

- *Il faut commencer tôt la mobilisation (dans les 24–48 heures) en dehors des contre-indications, y compris chez les patients sous sédation*

- *Il existe très peu d'études randomisées et contrôlées concernant la mobilisation précoce en réanimation*

Prise en charge de la mobilisation précoce en réanimation, chez l'adulte et l'enfant (électrostimulation incluse). Réanimation DOI 10.1007/s13546-013-0658-y **2013**

EN CONCLUSION,

La littérature nous montre que l'association de la pharmacologie et des moyens mécaniques semblent prévenir de manière efficace les risques de thrombose veineuse et embolie.

EN CONCLUSION

Optimiser la thromboprophylaxie, c'est…

Evaluer les patients à risque

- Connaissance historique patient
- Observation clinique du patient (tissus, réseau vasculaire,…)
- **Développer ?**
  - Système de cotation?
    - Facteurs de prédisposition
    - Risque associé à la maladie actuelle ou au geste chirurgical
    - *Peut être lourd fastidieux et long..*
  - Thromboprophylaxie normalisée par groupe?
    - Ex orthopédie, chirurgie abdominale..
    - *Attention jugement clinique pour variabilité*

TILT infirmier

- Détection des patients à risque et le niveau de risque
- Déterminer les interventions à mettre en place (CI..)
- Examen physique journalier du patient
- Planification du traitement prescrit
- Réflexion et vérification sur de possibles incompatibilités ou associations déconseillées.

Participation du personnel soignant aux « tours » médicaux

Combinaison des intervenants

- Planifier les interventions en fonction des intervenants (infirmière, kiné…)
- Mettre le matériel à disposition
- Communiquer
- Ecrire (dossier)
- Anticiper les risques

Pour agir, il faut comprendre

- Formation du personnel nécessaire

Physiopathologie

Médicaments

Matériels

Procédure de soins

MERCI DE VOTRE ATTENTION