SAMUEL AND JEAN FRANKEL CARDIOVASCULAR CENTER
MICHIGAN MEDICINE

Treatment of Cancer-associated VTE

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Disclosures

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- Consulting Fees
  - Pfizer/Bristol-Myers Squib, Janssen, Bayer, Boston Scientific, Abbott Vascular
- Grant Funding
  - Boston Scientific
- Board of Directors
  - Anticoagulation Forum

Clinical Case

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- 65yo woman with recently diagnosed stage III lung cancer presents to oncology clinic for management

- PMH: Hypertension, obesity, and diabetes mellitus
- FM: Mother with breast cancer, sister with DVT
- SH: Former smoker (quit 10 years ago)
- Meds: Lisinopril, metformin

During the clinical evaluation, the team considers these questions:

1) What is her risk of developing a DVT or PE?
2) If she develops a VTE, how should she be managed?

Cancer-VTE Epidemiology

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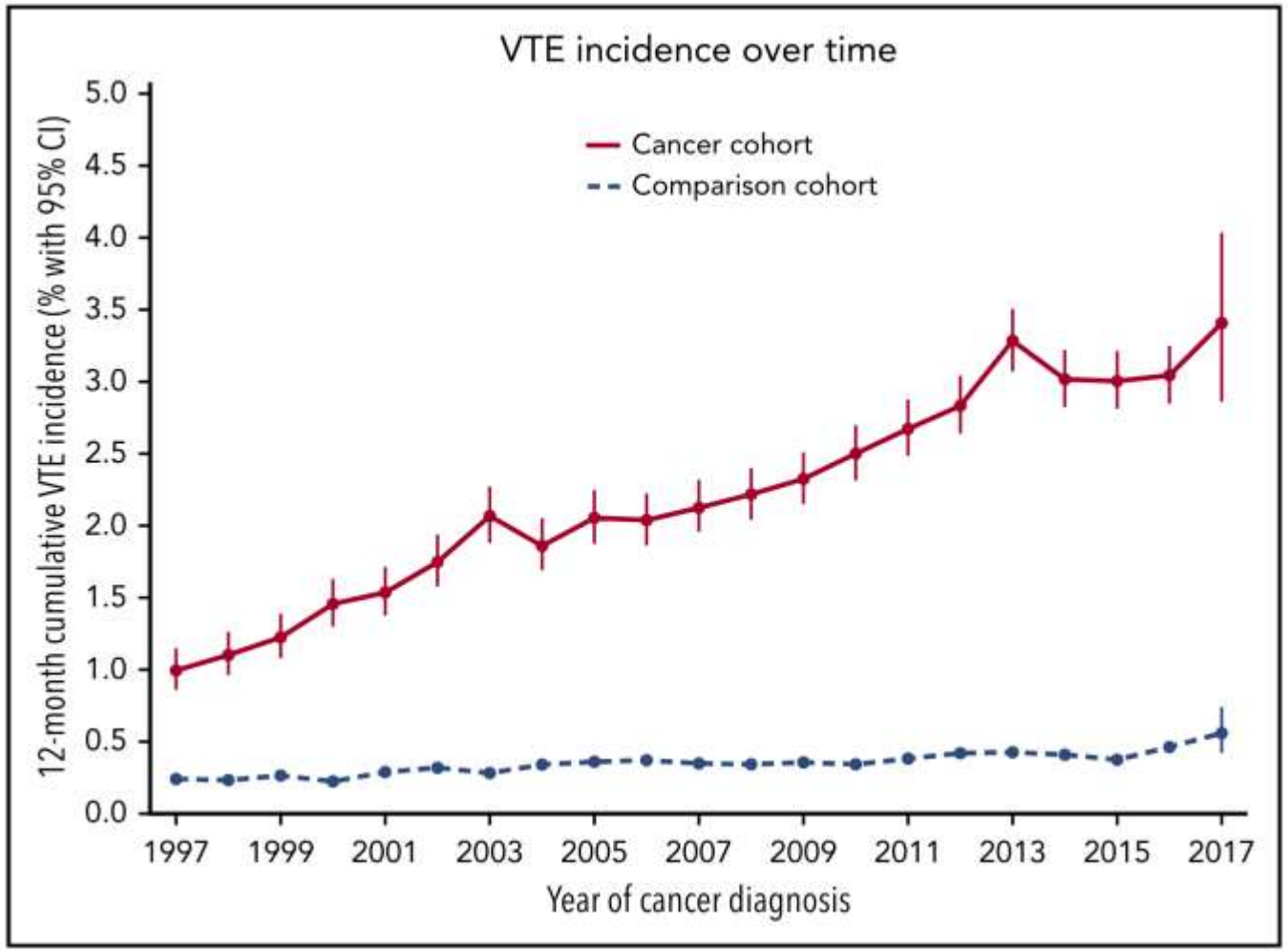

- 20-30% of all “First VTE” events may be cancer-associated
- Cancer patients at 4-7x ↑ risk of VTE than non-cancer patients

Blood 2021;137:1959-1969
Blood 2013;122:1712-1723

Cancer-VTE Epidemiology

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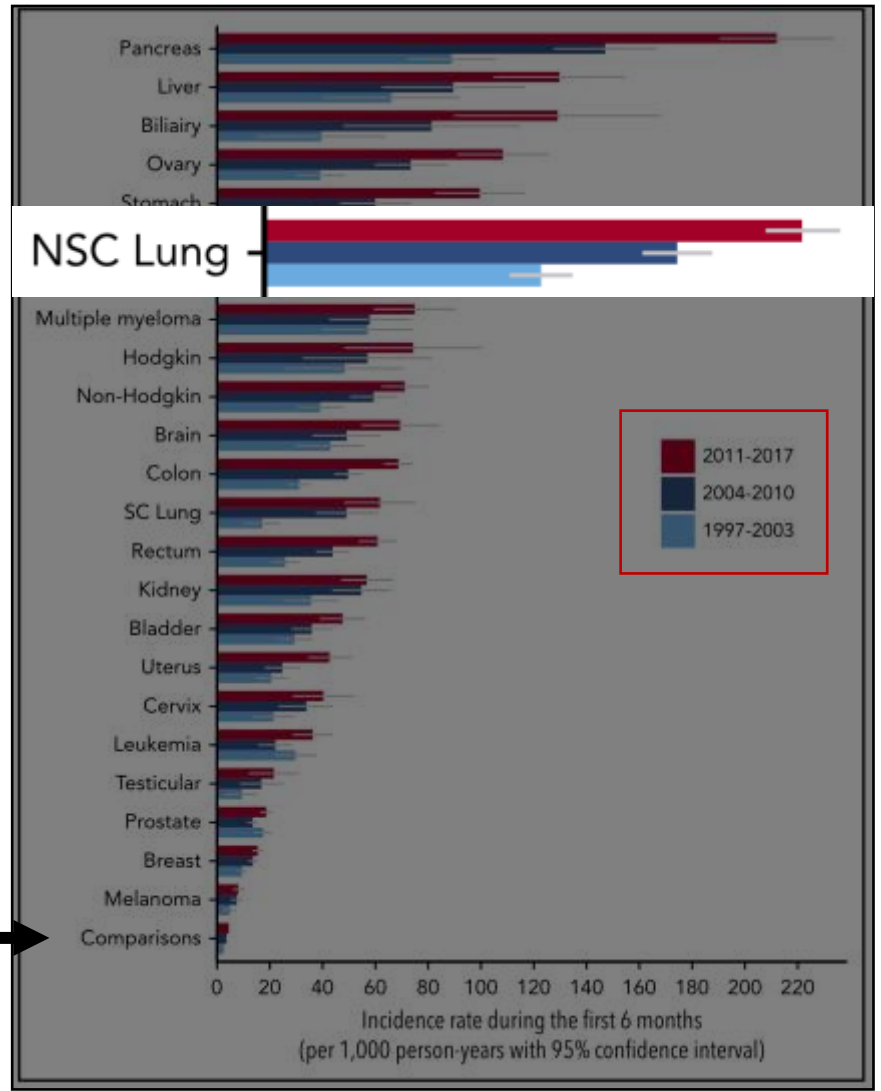

Overall VTE Risk in Cancer:

- Tumor-specific factors
  - Limited vs. metastatic (biggest predictor)
  - Tumor type (pancreatic, brain)
- Anatomic factors
  - Compression of veins
  - Infiltration
- Patient factors
  - Obesity
  - Age
- Therapy-associated factors
  - Chemotherapy
  - Surgery

Blood 2021;137:1959-1969. Blood 2013;122:1712-1723

Clinical Case (Cont)

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- Starts chemotherapy & radiation treatment
- 2 weeks later, develops acute shortness of breath
  - PECT → Bilateral PE, no right-heart strain
  - Vital signs stable

- Which anticoagulation strategy is best?

Cancer-associated VTE

LMWH > Warfarin for VTE Recurrence

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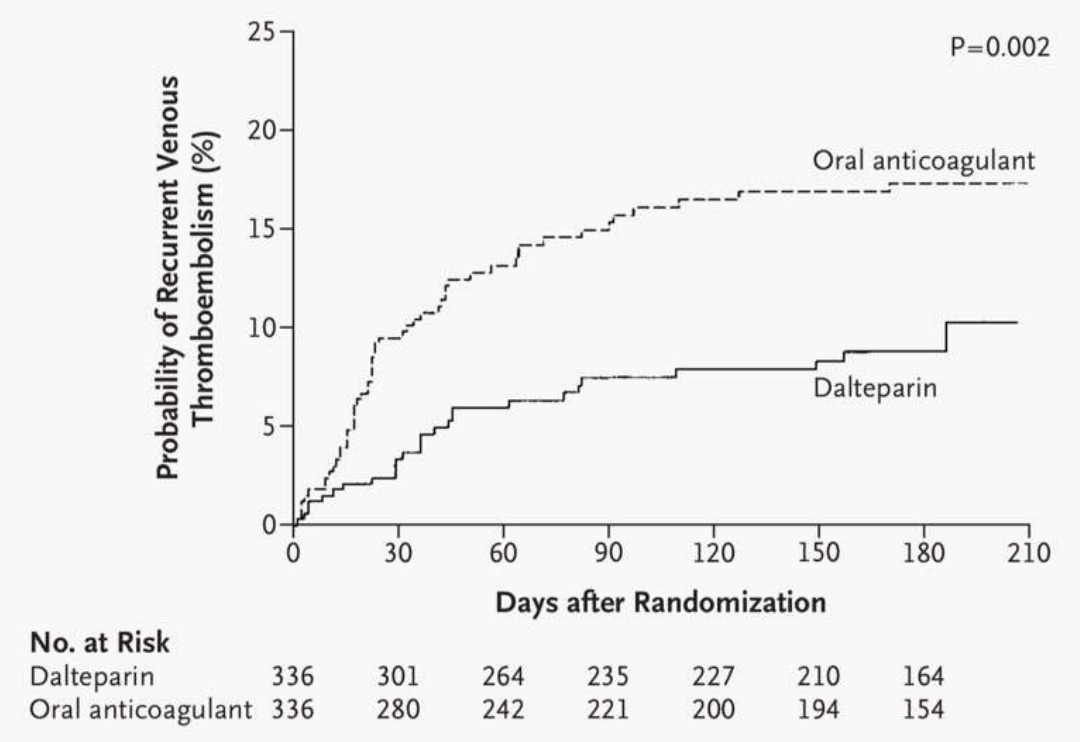
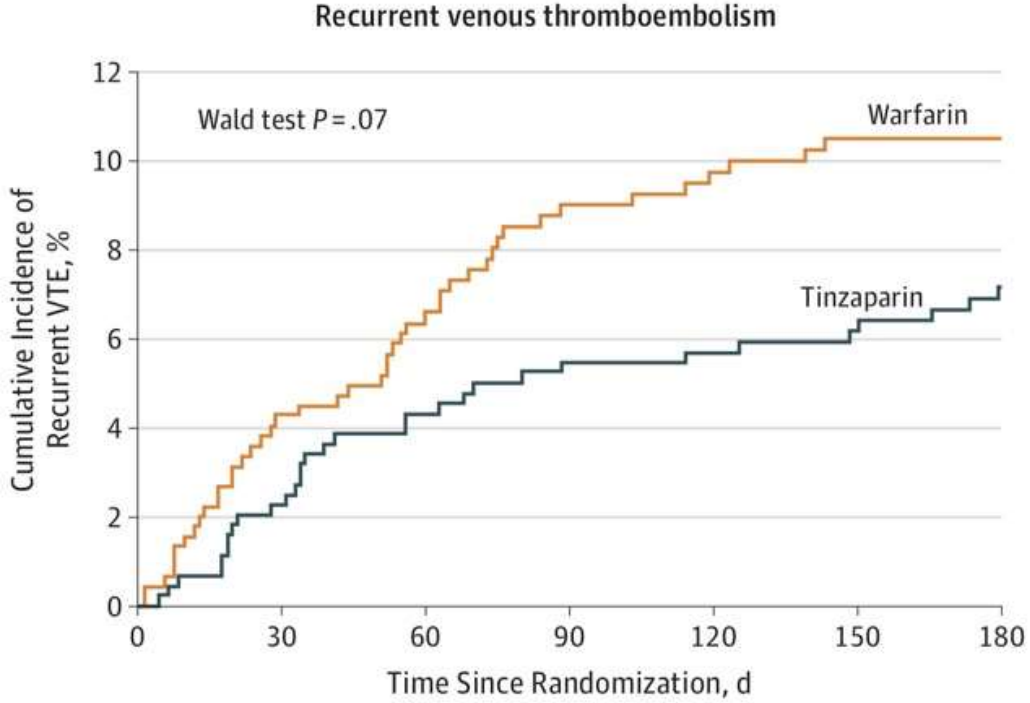
CLOT Trial



NEJM 2003; 349:146-53

CATCH Trial



JAMA 2015; 314:677-686

Direct Oral Anticoagulants: Hokusai VTE Study

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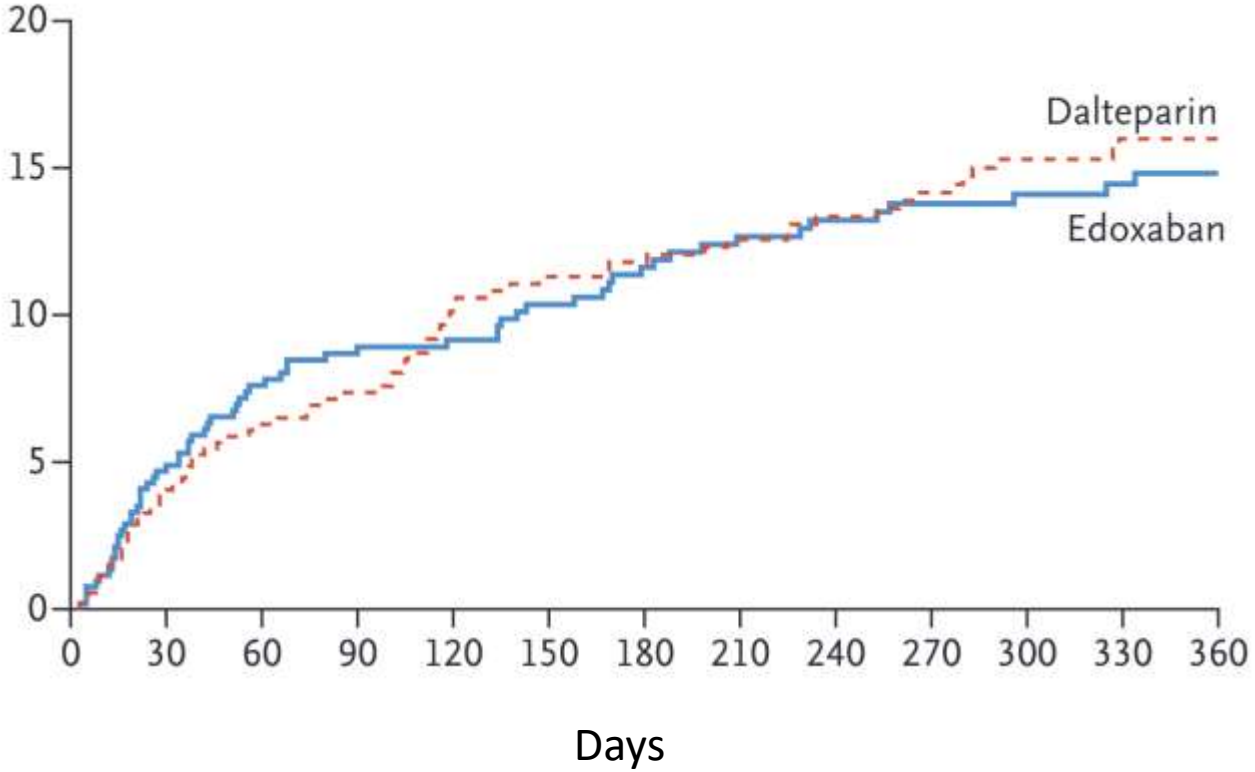
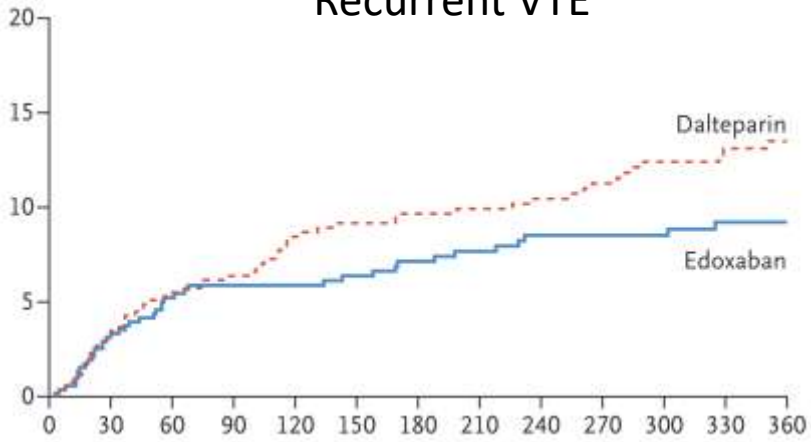
Recurrent VTE or Major Bleeding



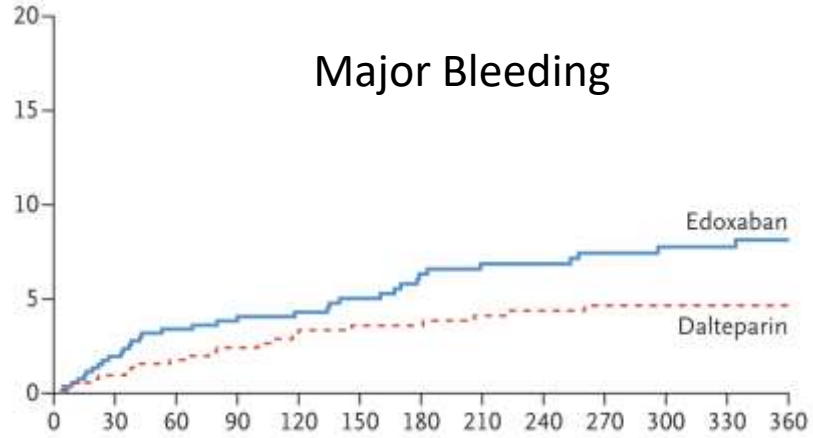
N=1046 patients with cancer-VTE

Recurrent VTE



P=0.09

Major Bleeding



P=0.04

NEJM 2018;378:615-624

CARAVAGGIO Study

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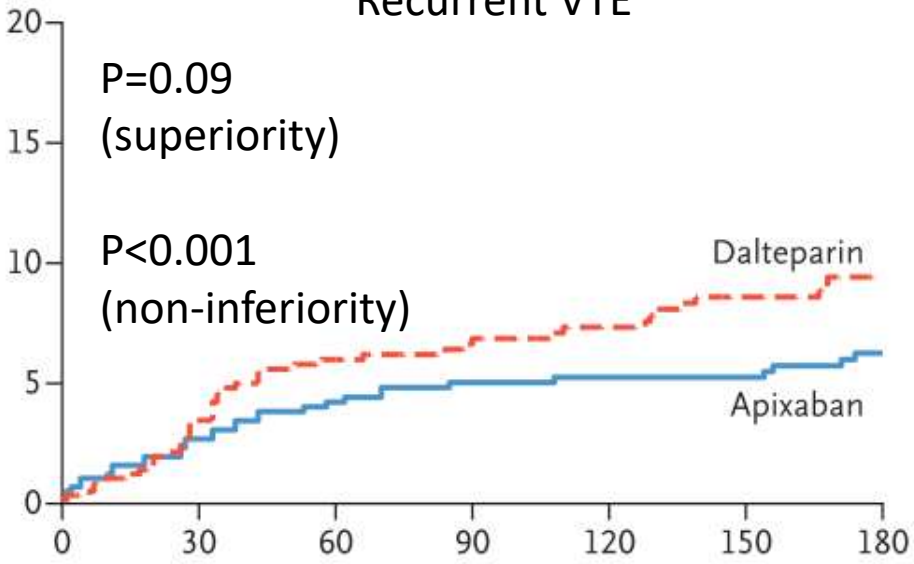
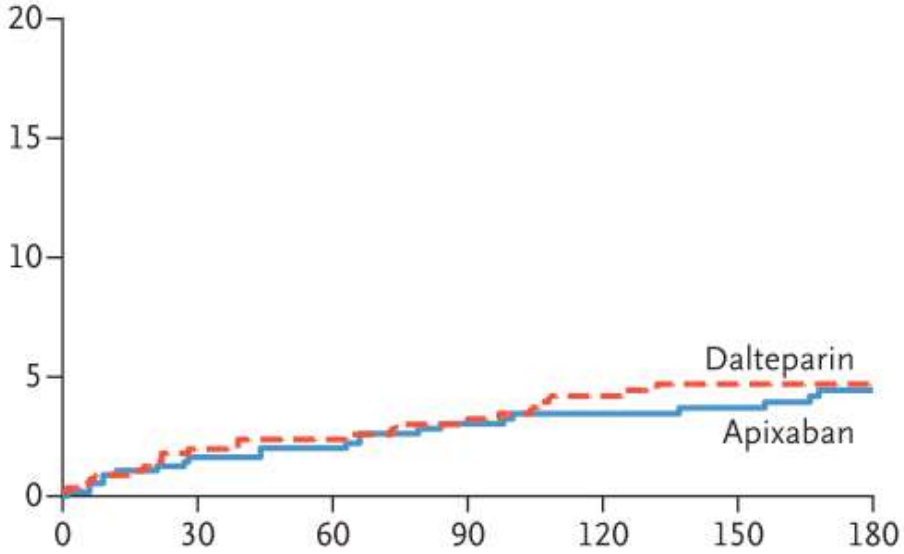
Recurrent VTE



P=0.09
(superiority)

P<0.001
(non-inferiority)

Major Bleeding



N=1154 patients with cancer-VTE

NEJM 2020;382:1599-1607

DOAC vs. LMWH Meta-analysis

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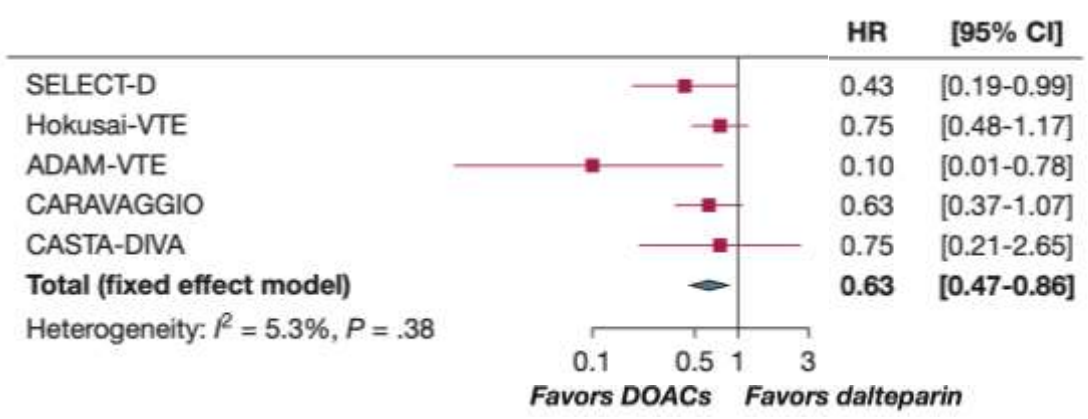
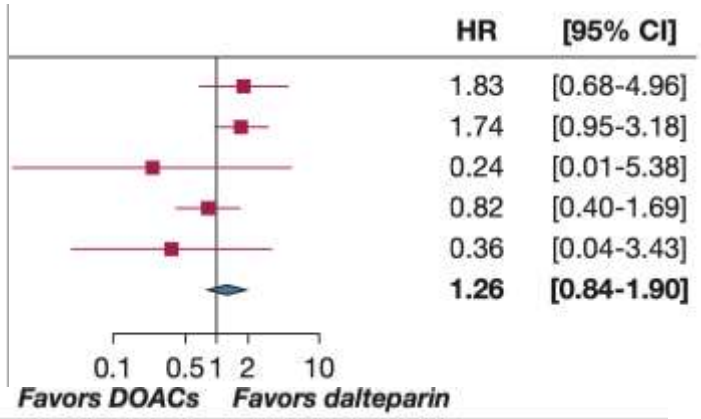
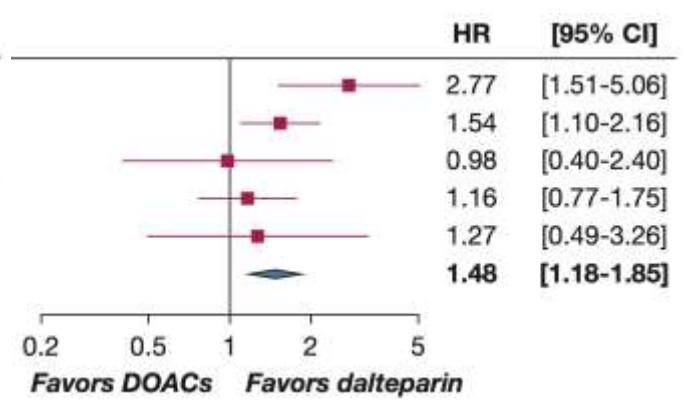
VTE Recurrence



Major Bleeding



CRNM Bleeding



Total:

0.63
0.47-0.86

1.26
0.84-1.90

1.48
1.18-1.85

Chest 2022;161:781-790

GI Cancer and Bleeding Risk

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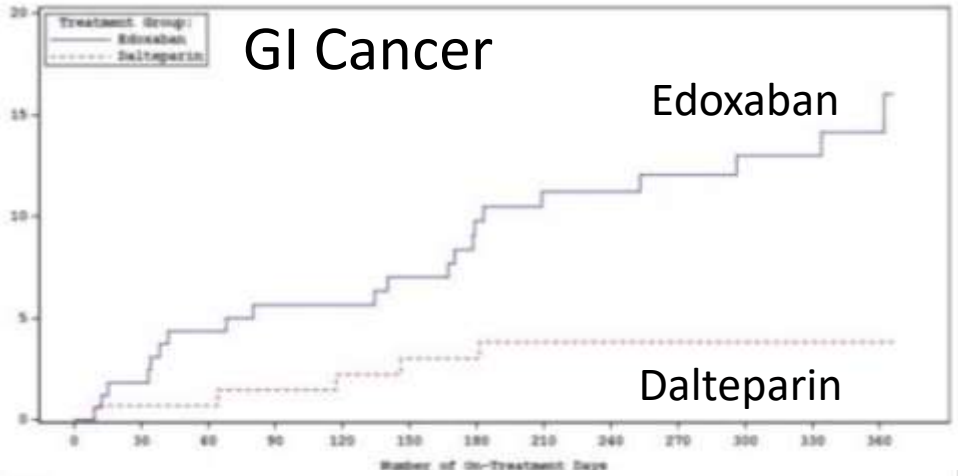
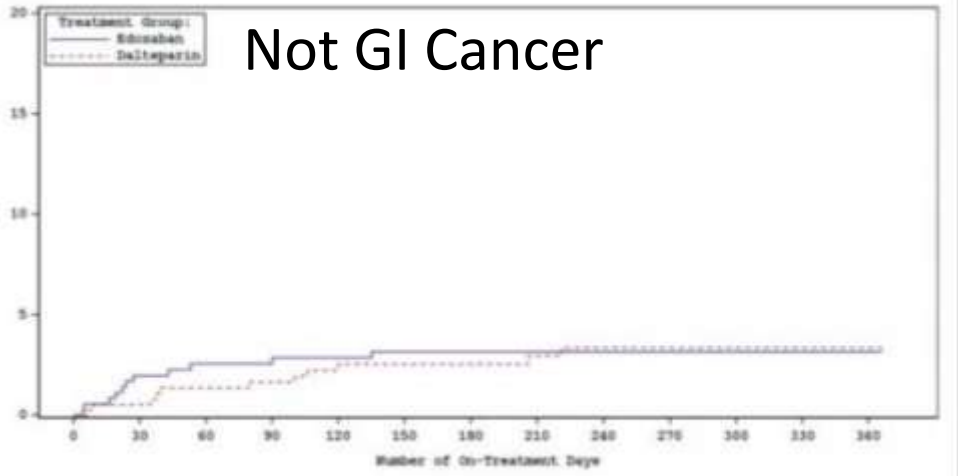
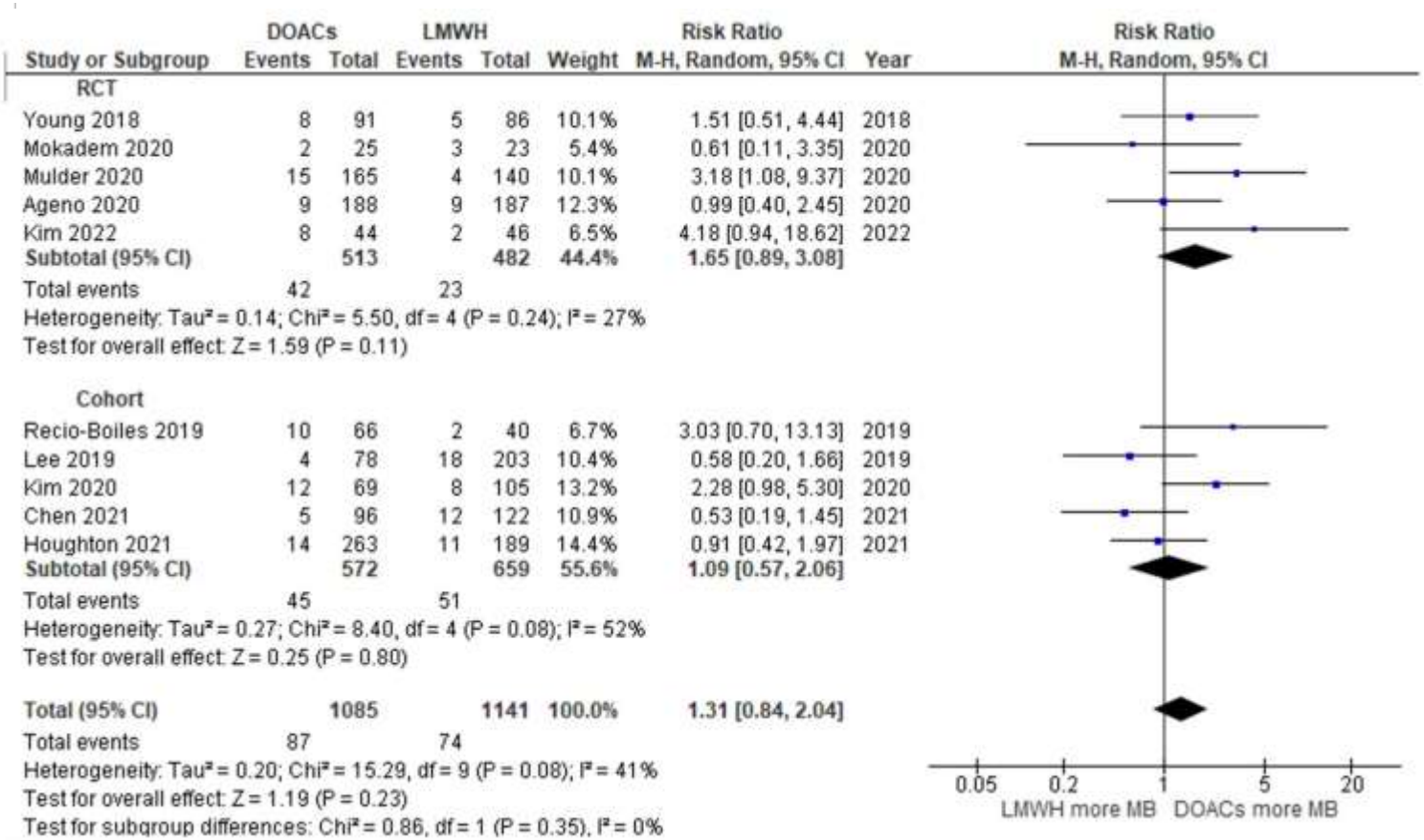
Major Bleeding



Major Bleeding



Thromb Haemost 2018;118:1439–1449



Thrombosis J 2022;20:41

ASH and ACCP Guideline Recs

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- Anticoagulation for at least 3-6 months
  - Prefer longer-therapy (>6 months)

- DOAC > LMWH > VKA

Chest 2021;160:2247-2259. Blood Adv 2021;5:927-974

Return to the Case

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- She initiates on a factor Xa inhibitor for acute PE

- Should she receive an IVC filter?

Role of IVC Filters for Cancer-VTE

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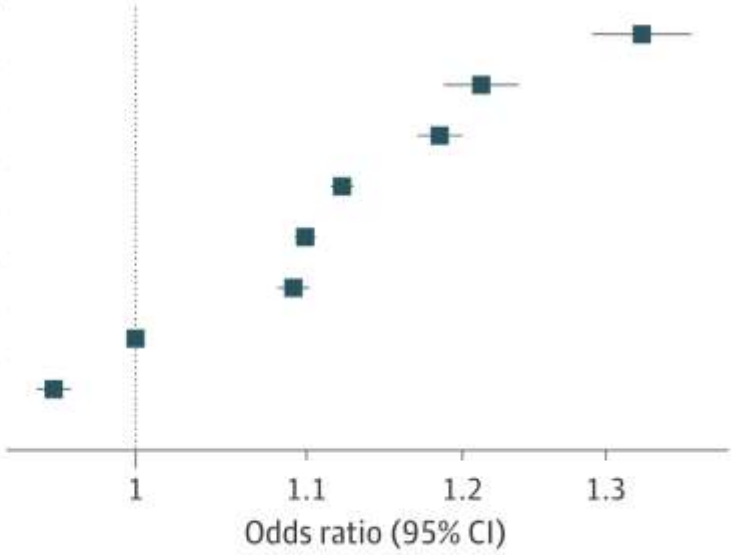
88,585 Patients in California and Florida (USA)

2005-2014

Figure 1. Association of Comorbidities with Inferior Vena Cava (IVC) Filter Placement

Variable	Odds ratio (95% CI)	*P* Value
Upper gastrointestinal bleeding	1.32 (1.29-1.37)	<.001
Intracranial bleeding	1.21 (1.19-1.11)	<.001
Lower gastrointestinal bleeding	1.19 (1.17-1.20)	<.001
Metastatic disease	1.12 (1.12-1.13)	<.001
Proximal deep vein thrombosis	1.10 (1.10-1.11)	<.001
Coagulopathy	1.09 (1.08-1.10)	<.001
Age	1.00 (1.00-1.00)	<.001
Use of anticoagulation	0.96 (0.95-0.97)	<.001



JAMA Netw Open 2020;3:e2011079

Role of IVC Filters for Cancer-VTE

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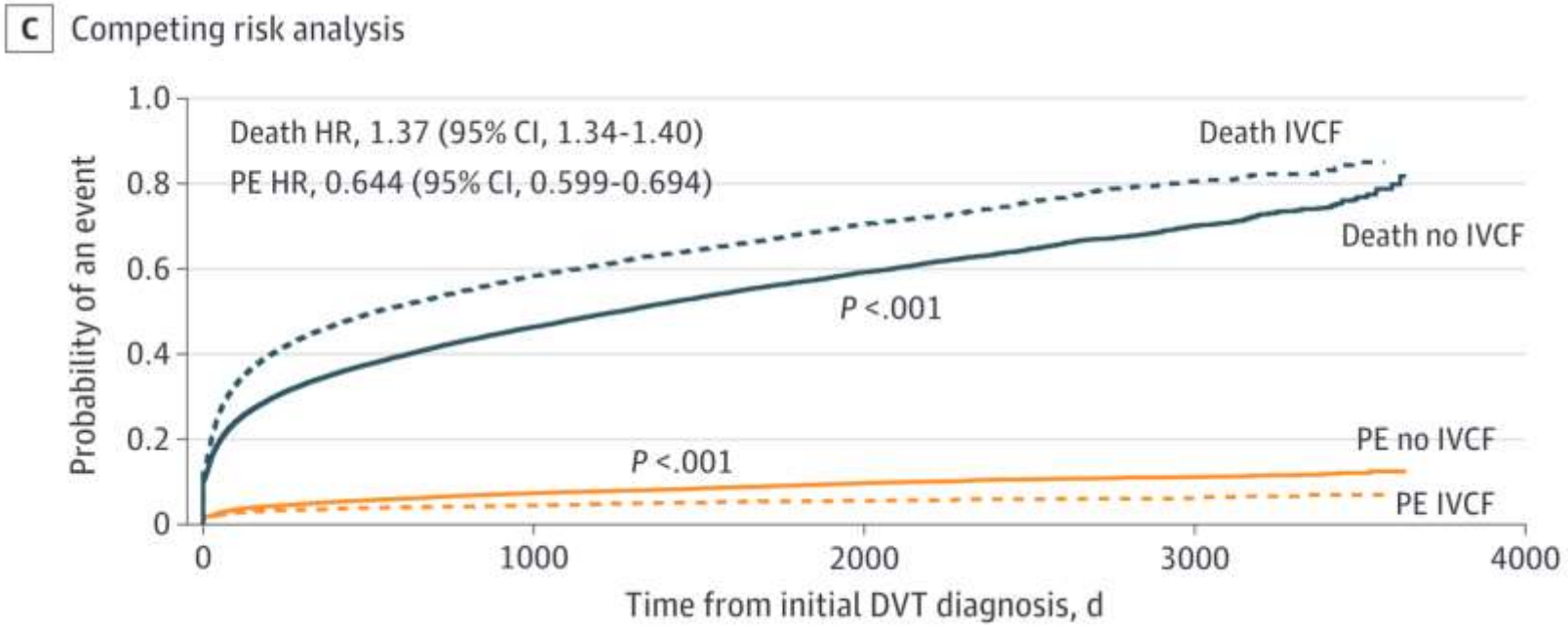

IVC Filter in Cancer-VTE:
Less PE
More death?

JAMA Netw Open 2020;3:e2011079

Return to the Case

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- 65yo woman with lung cancer
- What is her risk of developing VTE?
  - High – stage III lung cancer
- What is best anticoagulation strategy?
  - Factor Xa inhibitor (apixaban, edoxaban, rivaroxaban) preferred
  - LMWH as secondary option
- When are IVC filters recommended?
  - When anticoagulation *cannot* be given

Summary

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- Cancer is a leading cause of VTE
  - Increasing prevalence
- Factor Xa inhibitors are first-line therapy for cancer-VTE
  - Caution with GI cancer
- IVC filter use is very limited

Thank you!

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