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Optimal Thromboprophylaxis And Post-Op Duplex Imaging Following Superficial Venous Procedures
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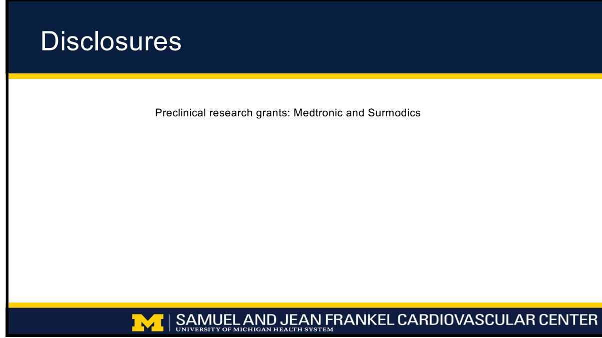
Disclosures
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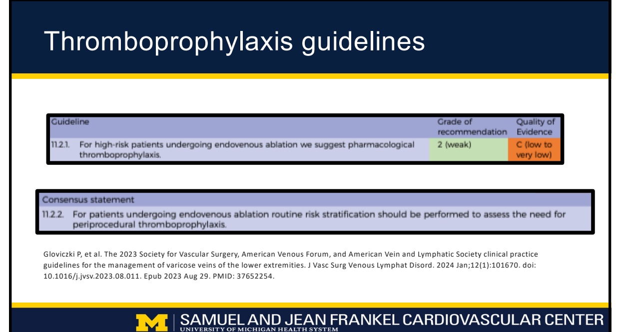
Thromboprophylaxis guidelines
Guideline | Grade of recommendation | Quality of Evidence
11.2.1. For high-risk patients undergoing endovenous ablation we suggest pharmacological thromboprophylaxis. | 2 (weak) | C (low to very low)
Consensus statement
11.2.2. For patients undergoing endovenous ablation routine risk stratification should be performed to assess the need for periprocedural thromboprophylaxis.
Gloviczki P, et al. The 2023 Society for Vascular Surgery, American Venous Forum, and American Vein and Lymphatic Society clinical practice guidelines for the management of varicose veins of the lower extremities. J Vasc Surg Venous Lymphat Disord. 2024 Jan;12(1):101670. doi: 10.1016/j.jvsv.2023.08.011. Epub 2023 Aug 29. PMID: 37652254.
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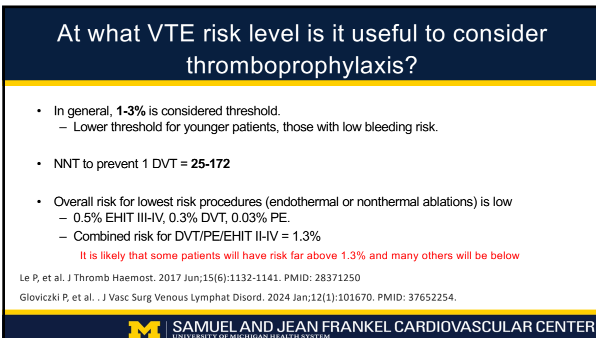
At what VTE risk level is it useful to consider thromboprophylaxis?
In general, 1-3% is considered threshold.
– Lower threshold for younger patients, those with low bleeding risk.
NNT to prevent 1 DVT = 25-172
Overall risk for lowest risk procedures (endothermal or nonthermal ablations) is low
– 0.5% EHIT III-IV, 0.3% DVT, 0.03% PE.
– Combined risk for DVT/PE/EHIT II-IV = 1.3%
It is likely that some patients will have risk far above 1.3% and many others will be below
Le P, et al. J Thromb Haemost. 2017 Jun;15(6):1132-1141. PMID: 28371250
Gloviczki P, et al. . J Vasc Surg Venous Lymphat Disord. 2024 Jan;12(1):101670. PMID: 37652254.
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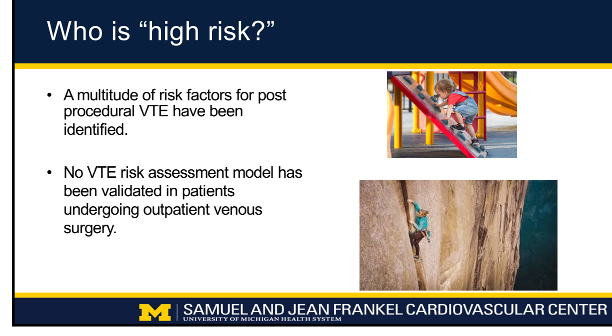
Who is "high risk?"
A multitude of risk factors for post procedural VTE have been identified.
No VTE risk assessment model has been validated in patients undergoing outpatient venous surgery.
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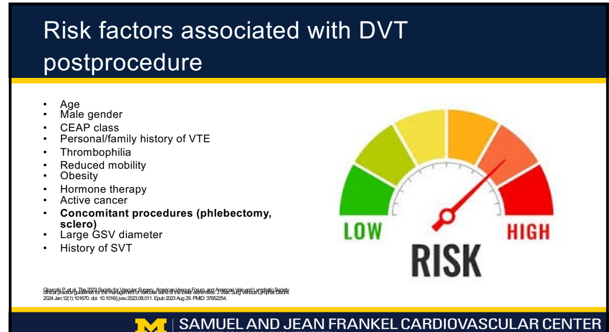
Risk factors associated with DVT postprocedure
Age
Male gender
CEAP class
Personal/family history of VTE
Thrombophilia
Reduced mobility
Obesity
Hormone therapy
Active cancer
Concomitant procedures (phlebectomy, sclero)
Large GSV diameter
History of SVT
LOW
HIGH
RISK
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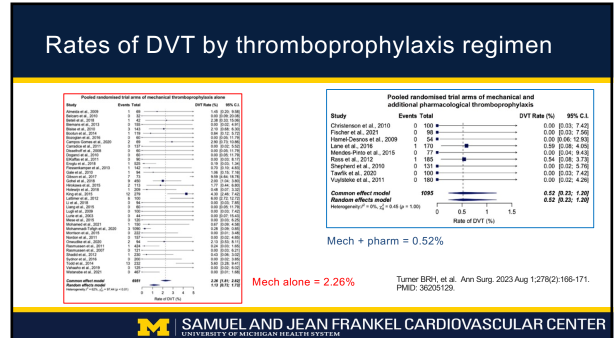
Rates of DVT by thromboprophylaxis regimen
Pooled randomised trial arms of mechanical thromboprophylaxis alone
Mech alone = 2.26%
Pooled randomised trial arms of mechanical and additional pharmacological thromboprophylaxis
Study | Events | Total | DVT Rate (%) | 95% C.I.
Christenson et al., 2010 | 0 | 100 | 0.00 | [0.03; 7.42]
Fischer et al., 2021 | 0 | 98 | 0.00 | [0.03; 7.56]
Hamel-Desnos et al., 2009 | 0 | 54 | 0.00 | [0.06; 12.93]
Lane et al., 2016 | 1 | 170 | 0.59 | [0.08; 4.05]
Mendes-Pinto et al., 2015 | 0 | 77 | 0.00 | [0.04; 9.43]
Rass et al., 2012 | 1 | 185 | 0.54 | [0.08; 3.73]
Shepherd et al., 2010 | 0 | 131 | 0.00 | [0.02; 5.76]
Tawfik et al., 2020 | 0 | 100 | 0.00 | [0.03; 7.42]
Vuylsteke et al., 2011 | 0 | 180 | 0.00 | [0.02; 4.26]
Common effect model | 1095 | 0.52 [0.23; 1.20]
Random effects model | 0.52 [0.23; 1.20]
Heterogeneity: $I^2 = 0\%$, $\chi^2_8 = 0.45$ ($p = 1.00$)
0 0.5 1 1.5
Rate of DVT (%)
Mech + pharm = 0.52%
Turner BRH, et al. Ann Surg. 2023 Aug 1;278(2):166-171. PMID: 36205129.
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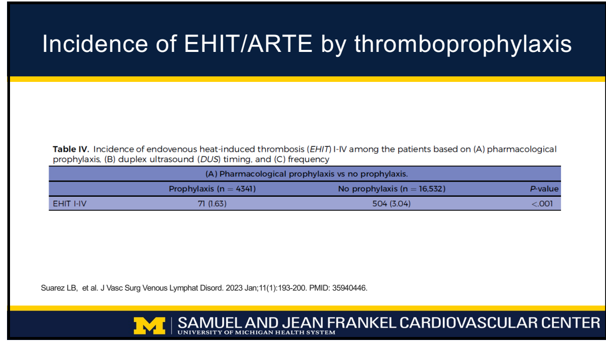
Incidence of EHIT/ARTE by thromboprophylaxis
Table IV. Incidence of endovenous heat-induced thrombosis (EHIT) I-IV among the patients based on (A) pharmacological prophylaxis, (B) duplex ultrasound (DUS) timing, and (C) frequency
(A) Pharmacological prophylaxis vs no prophylaxis
| Prophylaxis (n = 4341) | No prophylaxis (n = 16,532) | P-value
EHIT I-IV | 71 (1.63) | 504 (3.04) | <.001
Suarez LB, et al. J Vasc Surg Venous Lymphat Disord. 2023 Jan;11(1):193-200. PMID: 35940446.
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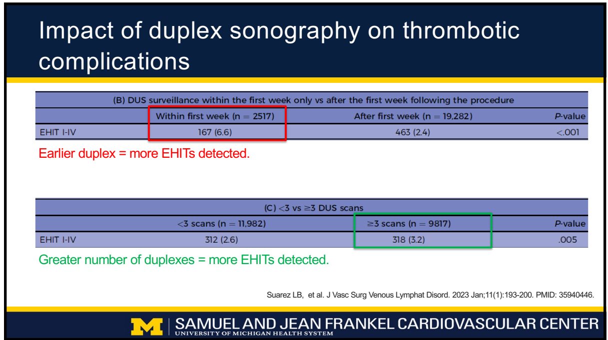
Impact of duplex sonography on thrombotic complications
(B) DUS surveillance within the first week only vs after the first week following the procedure
| Within first week (n = 2517) | After first week (n = 19,282) | P-value
EHIT I-IV | 167 (6.6) | 463 (2.4) | <.001
Earlier duplex = more EHITs detected.
(C) <3 vs ≥3 DUS scans
| <3 scans (n = 11,982) | ≥3 scans (n = 9817) | P-value
EHIT I-IV | 312 (2.6) | 318 (3.2) | .005
Greater number of duplexes = more EHITs detected.
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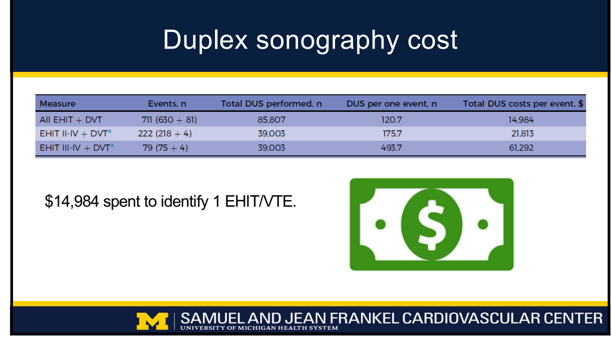
Duplex sonography cost
Measure | Events, n | Total DUS performed, n | DUS per one event, n | Total DUS costs per event, $
All EHIT + DVT | 711 (630 + 81) | 85,807 | 120.7 | 14,984
EHIT II-IV + DVT[a] | 222 (218 + 4) | 39,003 | 175.7 | 21,813
EHIT III-IV + DVT[a] | 79 (75 + 4) | 39,003 | 493.7 | 61,292
$14,984 spent to identify 1 EHIT/VTE.
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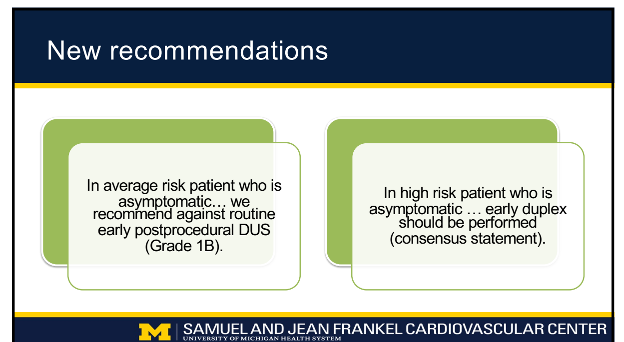
New recommendations
In average risk patient who is asymptomatic… we recommend against routine early postprocedural DUS (Grade 1B).
In high risk patient who is asymptomatic … early duplex should be performed (consensus statement).
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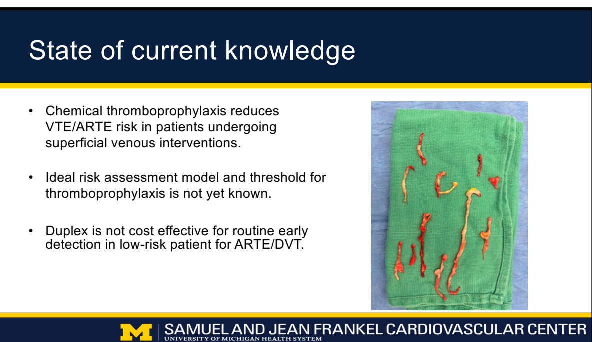
State of current knowledge
• Chemical thromboprophylaxis reduces VTE/ARTE risk in patients undergoing superficial venous interventions.
• Ideal risk assessment model and threshold for thromboprophylaxis is not yet known.
• Duplex is not cost effective for routine early detection in low-risk patient for ARTE/DVT.
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Thank you
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