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From Publication to Pragmatic Trial:

Barriers and Facilitators to Deploying Healthcare AI

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September 26, 2025

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The Walsh Lab

Goals and Objectives

- To highlight barriers and facilitators to translating published risk models into live clinical systems to support randomized clinical trials
- To present evidence that predictive decision support affects clinical decision-making
- To disseminate lessons learned to catalyze similar efforts elsewhere

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TRIAL 1:
RISK MODEL-DRIVEN DECISION SUPPORT TO GUIDE SUICIDE PREVENTION

VIEWPOINT

Action-Informed Artificial Intelligence—Matching the Algorithm to the Problem

Christopher J. Lindsell, PhD[1]; William W. Stead, MD[2,3]; Kevin B. Johnson, MD, MS[2,4]

Figure. Illustration of an Artificial Intelligence (AI) Development Pipeline

1 Anticipation of clinical outcomes the AI tool will address

- Engage clinicians, patients, and operational leaders
- Define characteristics of affected patients and clinical settings
- Define how and to whom the algorithm's results will be provided

2 Research and development of the AI tool

- Obtain data for algorithm development
- Develop algorithms using collected data
- Confirm early validation of algorithm

3 Replication

- Identify similar data sources
- Identify similar patients
- Replication by computer simulation

4 Design, testing, and deployment of the AI tool

- Design the platform for use
- Test usability and feasibility for operational deployment
- Create the operational platform

5 Improvement of determined outcomes

- Implement the operational platform
- Test effectiveness in a pragmatic trial
- Implement the AI tool and algorithm-guided practice systemwide

Design and Deploy – Start in “Silent Mode”

2020-2022

JAMA Network Open

Original Investigation | Health Informatics

Prospective Validation of an Electronic Health Record–Based, Real-Time Suicide Risk Model

Colin G. Walsh, MD, MA; Kevin B. Johnson, MD, MS; Michael Ripperger; Sarah Sperry, PhD; Joyce Harris; Nathaniel Clark, MD; Elliot Fielstein, PhD; Laurie Novak, PhD, MHSA; Katelyn Robinson; William W. Stead, MD

JAMA Network Open

Original Investigation | Psychiatry

Integration of Face-to-Face Screening With Real-time Machine Learning to Predict Risk of Suicide Among Adults

Drew Wilimitis, BS; Robert W. Turer, MD, MS; Michael Ripperger, BE; Allison B. McCoy, PhD; Sarah H. Sperry, PhD; Elliot M. Fielstein, PhD; Troy Kurz, MD; Colin G. Walsh, MD, MA

Set Benchmarks for Go/No-Go Decisions

Care Site	AUROC (95% CI)
Suicide attempt	
Medical center wide	0.797 (0.796 to 0.798)
Emergency department	0.7 (0.699 to 0.7)
Adult hospital	0.842 (0.841 to 0.842)
Behavioral health	0.544 (0.539 to 0.548)

doi:10.1001/jamanetworkopen.2021.1428

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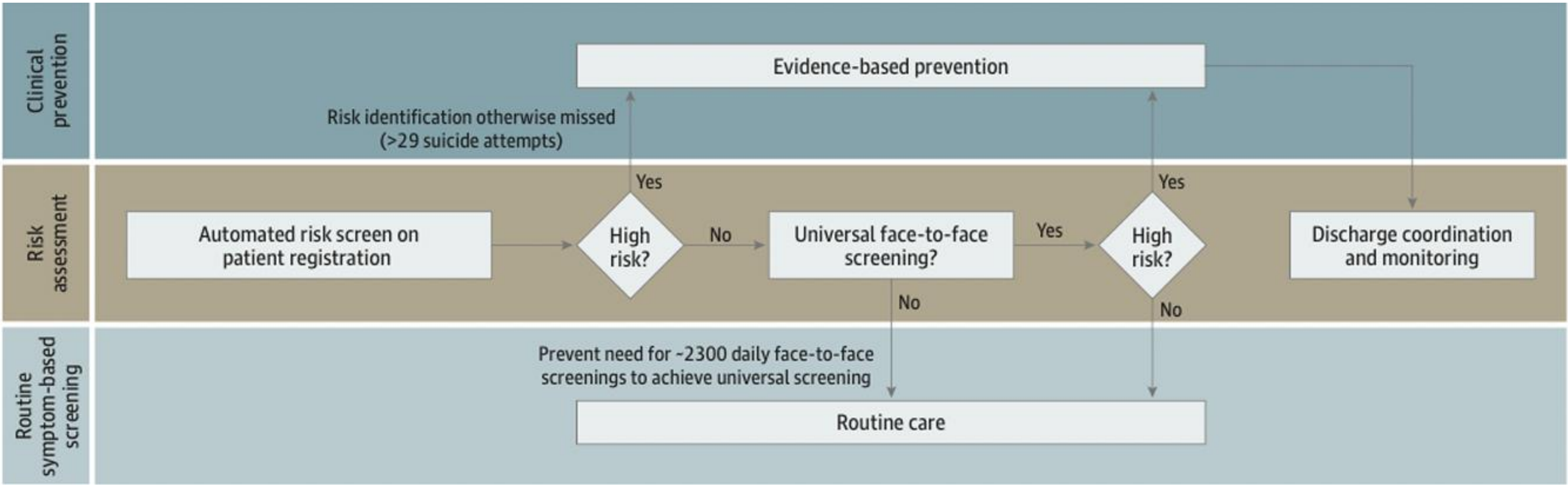
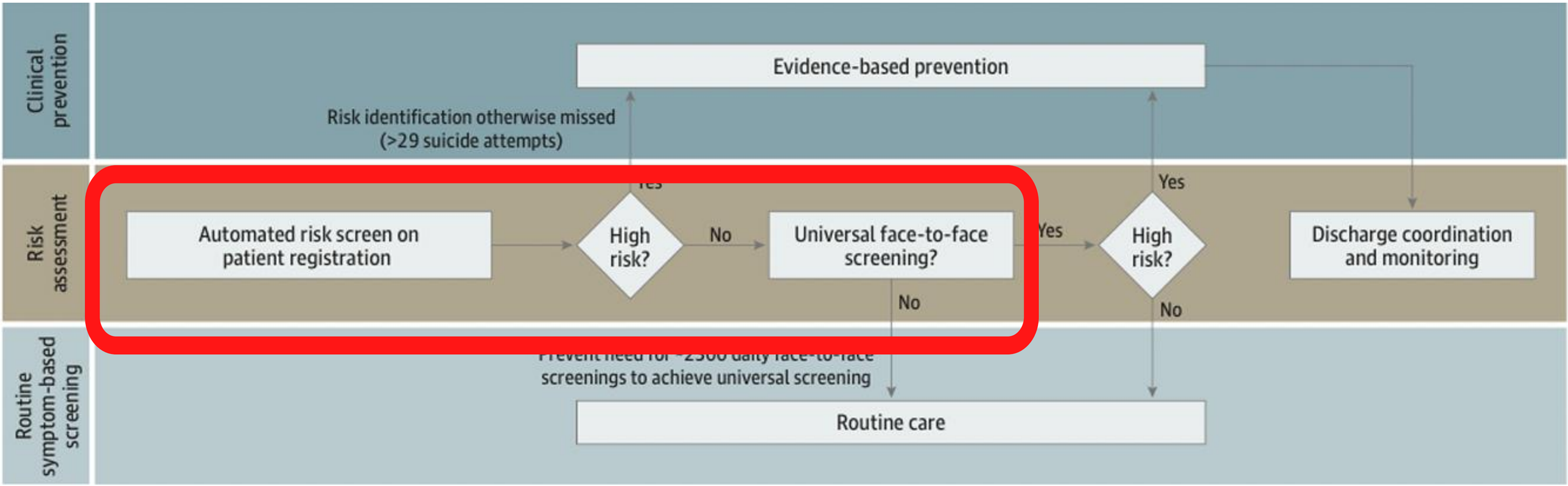
Integrate into existing workflow



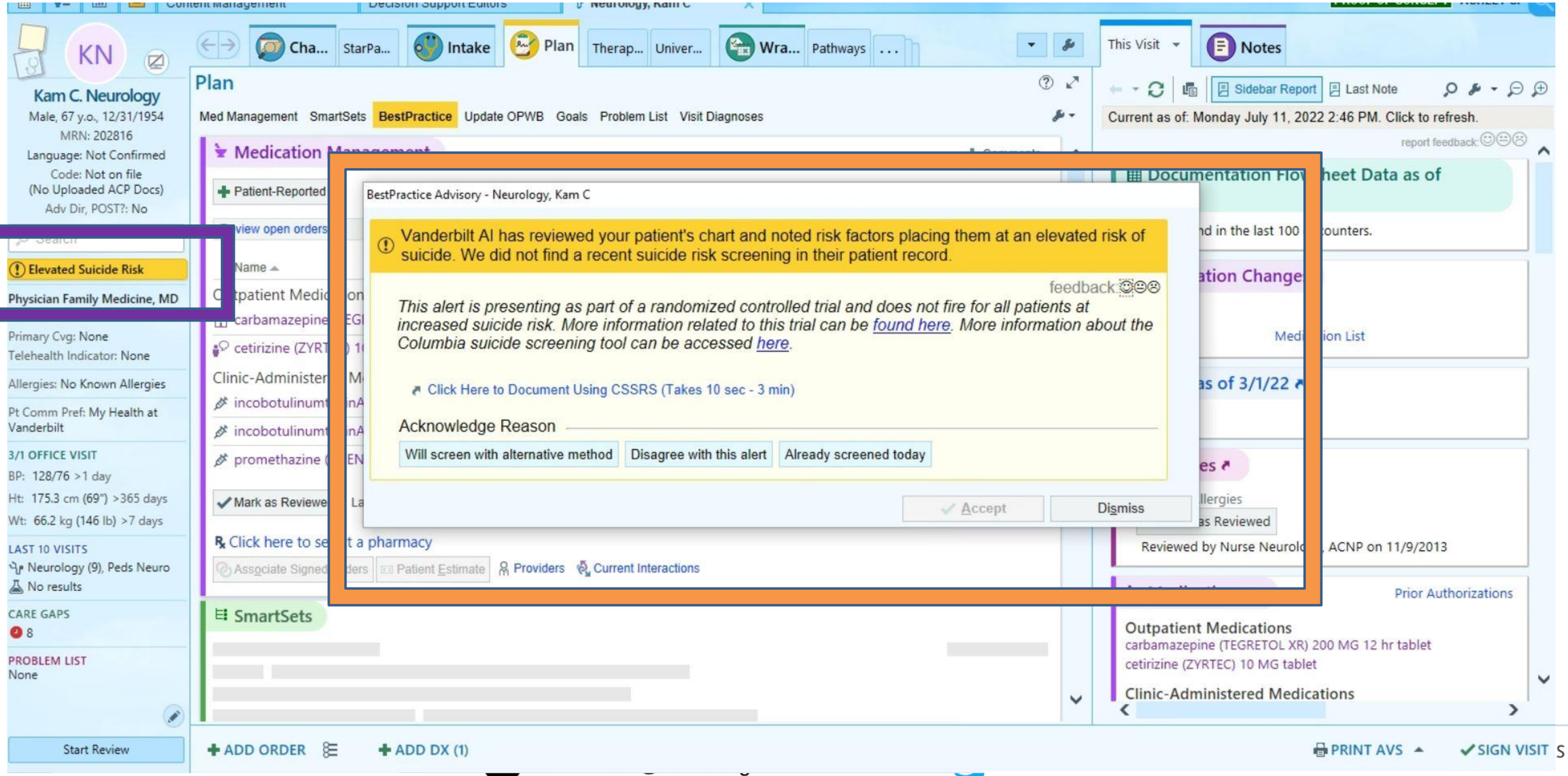
doi:10.1001/jamanetworkopen.2021.1428

Integrate into existing workflow



doi:10.1001/jamanetworkopen.2021.1428

The Clinical Decision Support



JAMA Network Open. 2025;8(1):e2452371. doi:10.1001/jamanetworkopen.2024.52371

Figure 2. Participant Flow Diagram

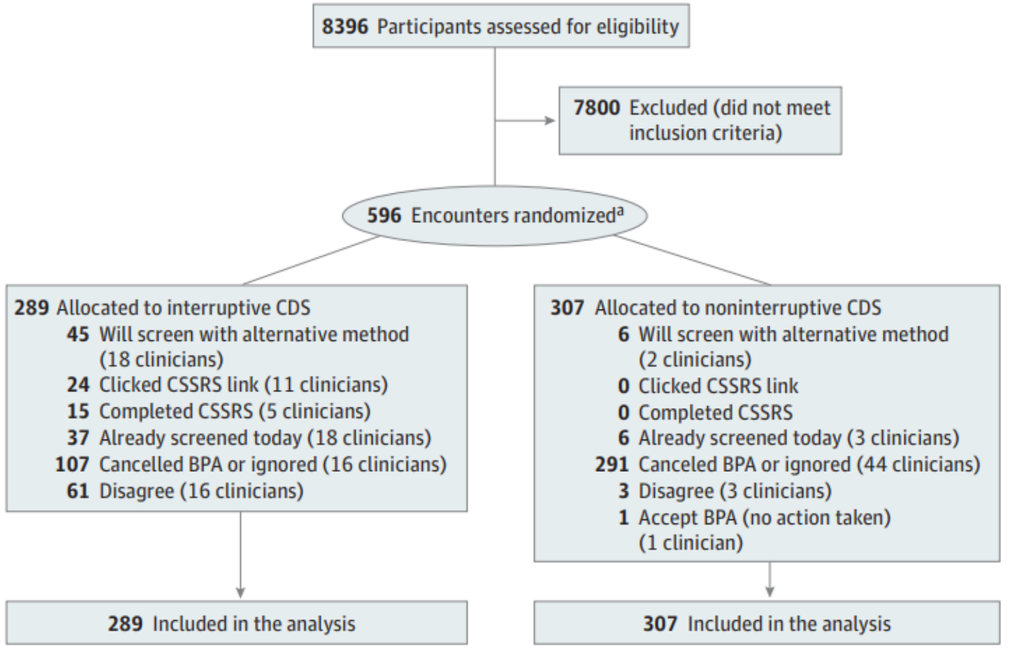


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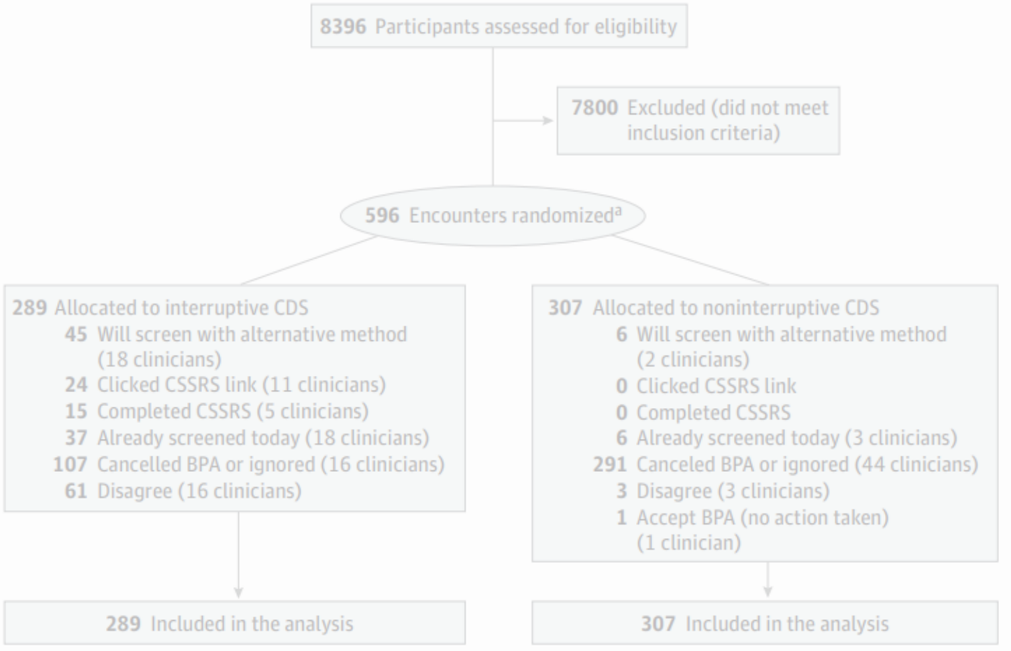
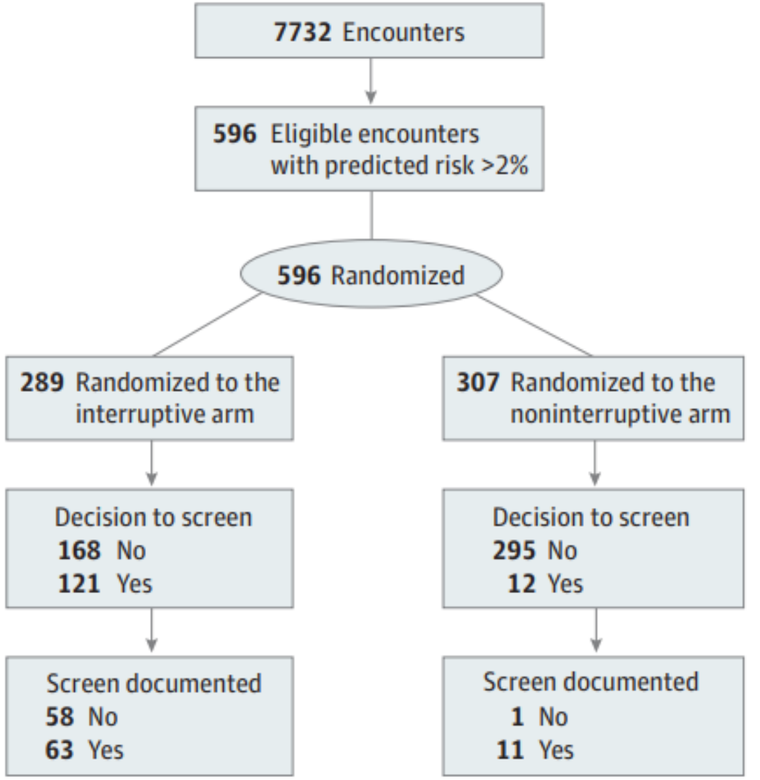
Figure 2. Participant Flow Diagram



JAMA Network Open. 2025;8(1):e2452371. doi:10.1001/jamanetworkopen.2024.52371

Figure 3. Flowchart of Trial Outcomes by Arm



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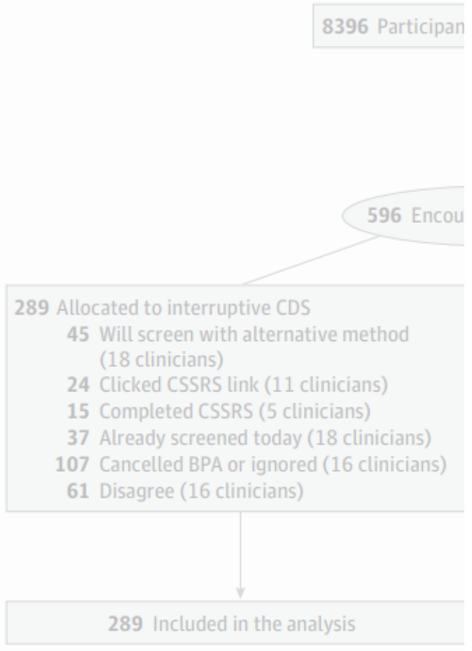
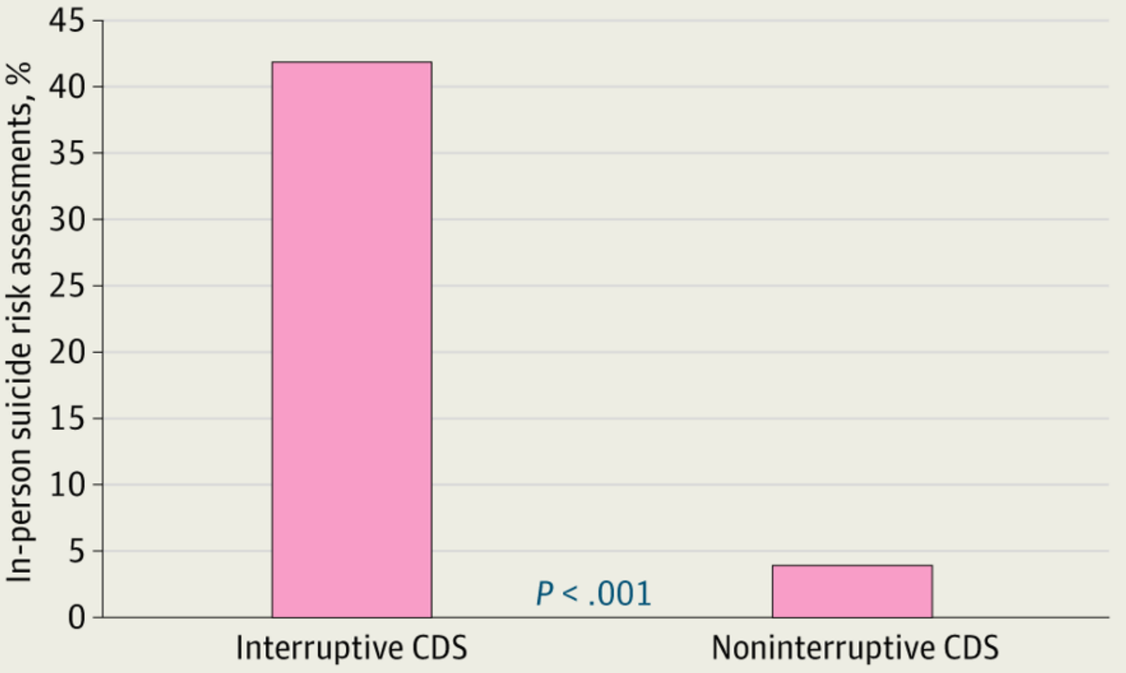


JAMA Network Open. 2025;8(1):e2452371. doi:10.100

FINDINGS

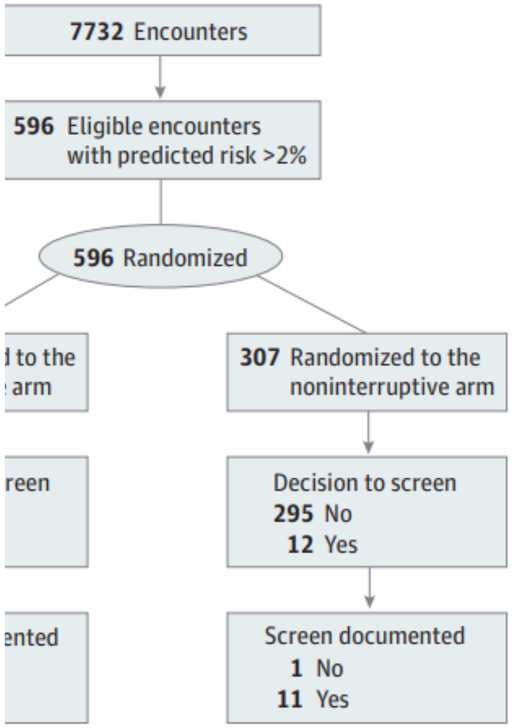
Interruptive CDS led to significantly higher numbers of decisions to screen for suicide risk in person compared with noninterruptive CDS



Odds ratio of in-person suicide risk assessment with interruptive CDS vs noninterruptive CDS,

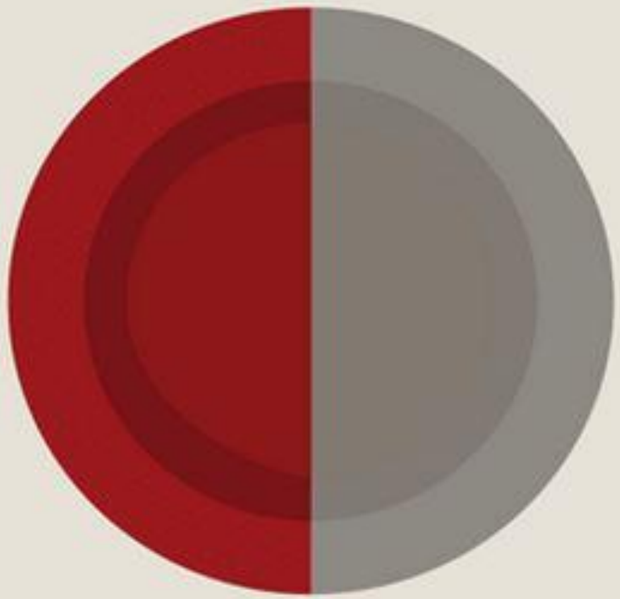
17.70 (95% CI, 6.42-48.79; *P* < .001)

rm



doi:10.1001/jamanetworkopen.2024.52371

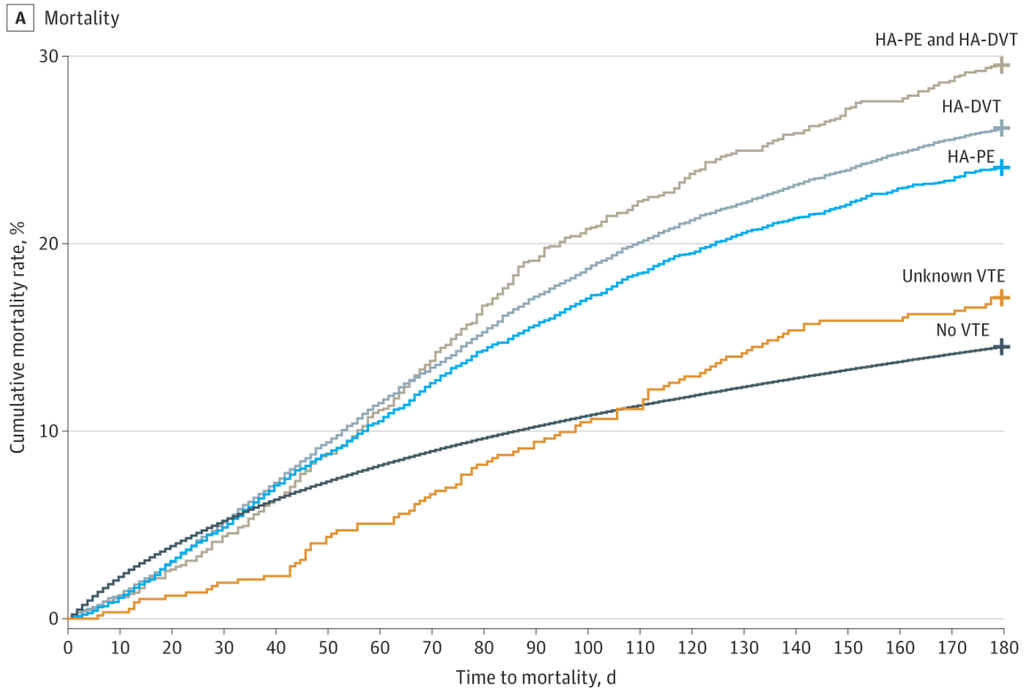
TRIAL 2:
PREVENTING HOSPITAL ACQUIRED VENOUS THROMBOEMBOLISM AT SCALE

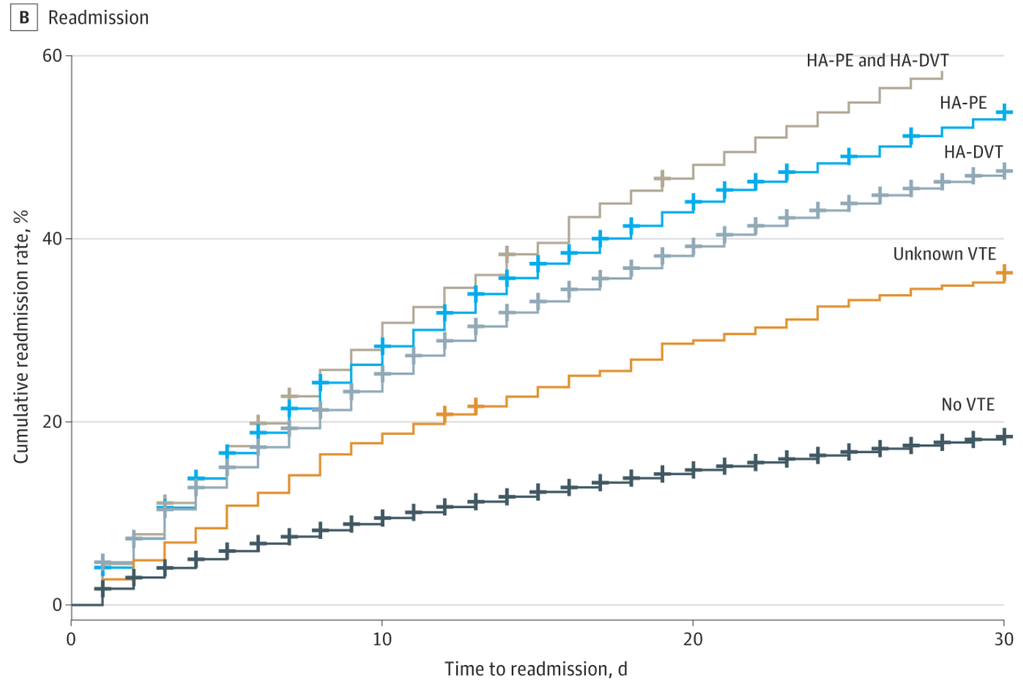


50%

of blood clots are healthcare-associated

StopTheClot.org





JAMA Netw Open
Published Online: November 21, 2022
2022;5;(11):e2240373. doi:10.1001/jamanetworkopen.2022.40373

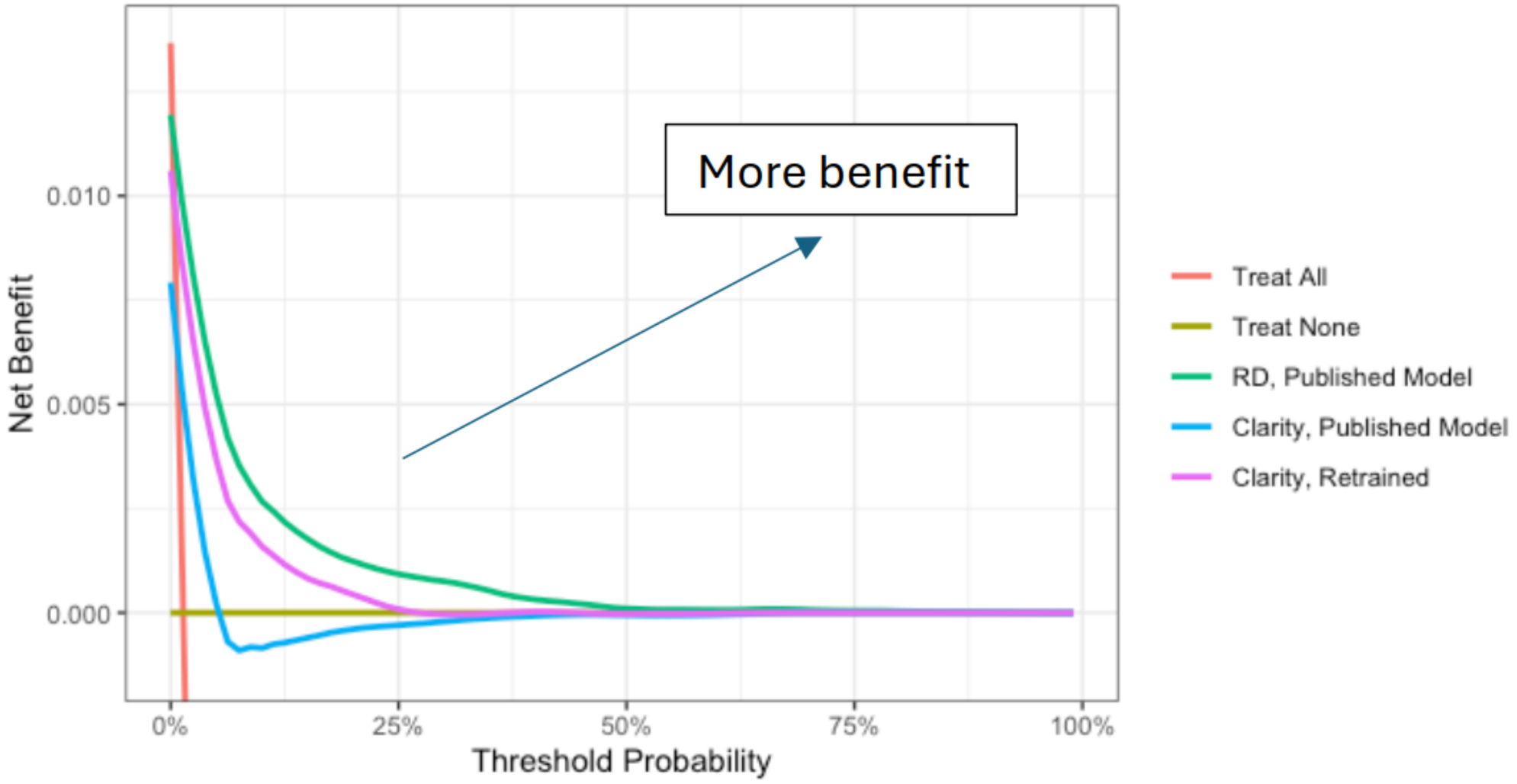
VTE-AI Risk Score

Variable	Coefficient
Intercept	-11.2511
Type of admission	
Elective (reference)	0
Emergency department	-0.1504
Trauma	0.9220
Inter-hospital transfer	0.2587
Unknown	0.4447
Heart rate, bpm (if unknown, use 85 bpm)	0.0066
Acute kidney injury comorbidity	0.3456
Candidal stomatitis comorbidity	0.4224
Cardiac arrhythmia comorbidity	1.0437
Cerebrovascular disease comorbidity	0.3128
Coagulopathy comorbidity	0.5130
Fluid or electrolyte disorder comorbidity	0.9052
Hypoxemia comorbidity	0.6224
Other anemia comorbidity	0.3740
Other psychiatric disorders comorbidity	0.3457
Paralysis comorbidity	0.2424
Peptic ulcer disease comorbidity	0.4756
Pleural disease comorbidity	0.5110
Pneumonia comorbidity	0.6928
Respiratory symptoms comorbidity	0.2332
Weight loss comorbidity	0.6310
Central line placed	1.1426
Sodium, mEq/L (if unknown, use 138 mEq/L)	0.0182
Chloride, mEq/L (if unknown, use 105 mEq/L)	0.0110
Blood urea nitrogen, mg/dL (if unknown, use 16 mg/dL)	-0.0089
C-reactive protein, mg/dL (if unknown, use 39.0 mg/dL)	0.0033

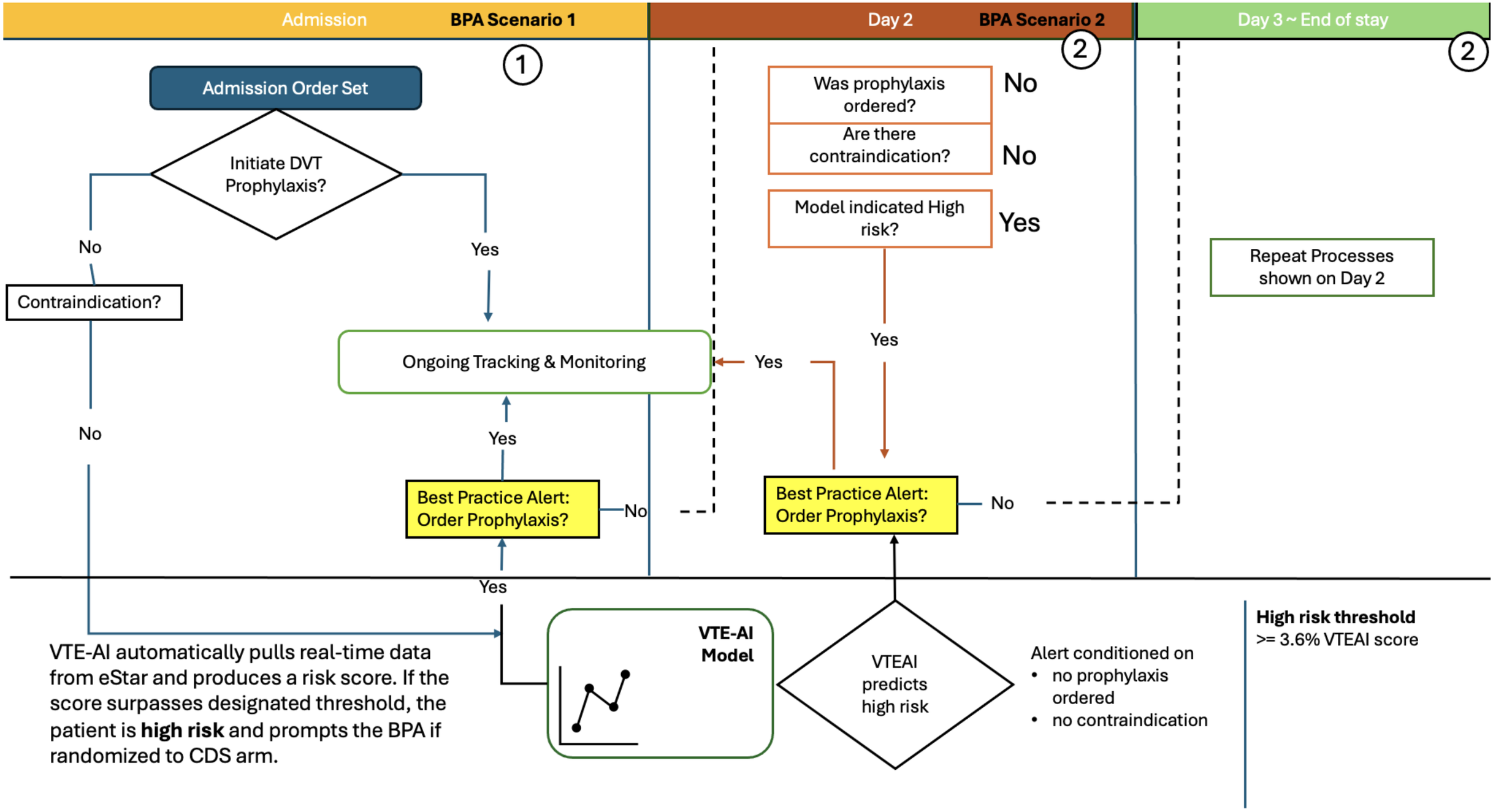
A real-time prognostic model for venous thromboembolic events among hospitalized adults

Benjamin F. Tillman[1] | Henry J. Domenico[2] | Ryan P. Moore[2] | Daniel W. Byrne[2] | Colleen T. Morton[1] | Amanda S. Mixon[3,4,5] | Benjamin French[2]

Silent validation -> Feature reengineering to prevent model failure



An every day clinical decision belies complexity…



** Accepted for Publication **

An every day clinical decision belies complexity…

So navigate it by building bridges
having meetings
lots of meetings
designing within a dynamic system
and double-checking your work

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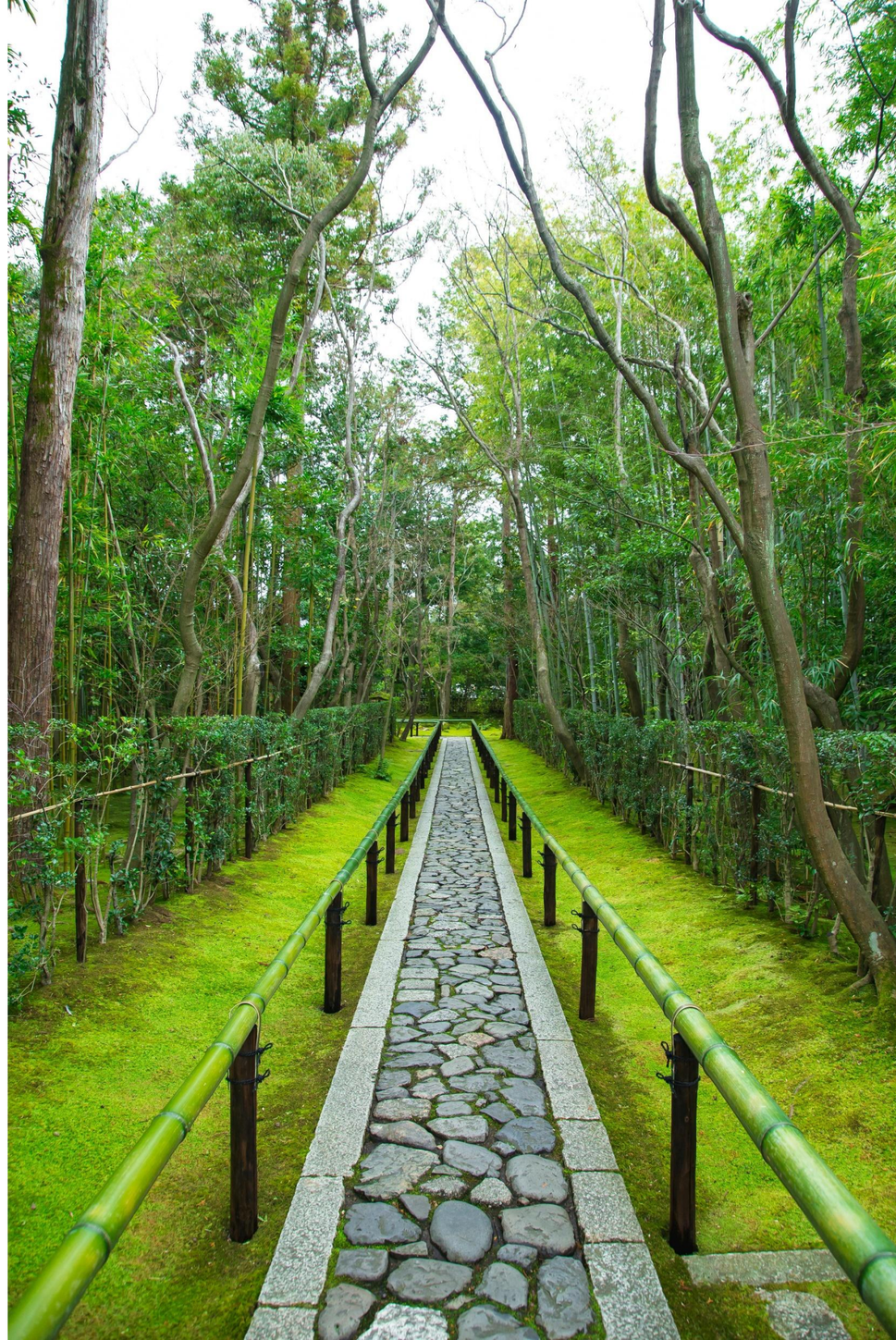
- SafeCourse RCT added to literature on Directive CDS driving behavior more effectively
- VTE-AI RCT launches September 2025 (VUMC IRB #241978, ClinicalTrials.gov Registered NCT06939803)
- Both required in silico validation, go/no-go decisions based on clinical benchmarks, and diligent bridge-building to those who tackle hard clinical problems every day



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AIM HI