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POSTER ABSTRACTS

901.HEALTH SERVICES AND QUALITY IMPROVEMENT - NON-MALIGNANT CONDITIONS

Results from Multisite Implementation of Electronic Health Record Tools for Clinical Pre-Test Probability of Pulmonary Embolism in the Emergency Department

Damon E. Houghton, MDMS[1], Lisa Baumann Kreuziger, MD MS[2], Megan Keenan[3], Hayley Dykhoff[4], Kyle Campbell[3], Marie Hall[3], Heather Heaton, MD[5], Kristine Thompson, MD[6], Jaime Aranda, MD[7], Sarah Balgord, MD[7], Jonathan Rubin, MD[7], Ali Raja, MD MBA[8], Sayon Dutta, MD[8], Ryan Hanson[9], Dustin McEvoy[8], Wei He[8], Emily Cahill, MPH,BS[10], Rachel P. Rosovsky, MD[11,12]

[1] Department of Cardiovascular Diseases, Division of Vascular Medicine & Dept of Medicine, Division of Hematology, Mayo Clinic, Rochester, MN
[2] Versiti, Menomonee Falls, WI
[3] Health Services Advisory Group, Phoenix, AZ
[4] Health Services Advisory Group, Phoeniz, AZ
[5] Emergency Medicine, Mayo Clinic, Rochester, MN
[6] Emergency Medicine, Mayo Clinic, Jacksonville, FL
[7] Medical College of Wisconsin, Milwaukee, WI
[8] Massachusetts General Hospital, Boston, MA
[9] Froedtert Hospital, Milwaukee, WI
[10] American Society of Hematology, Washington, DC
[11] Division of Hematology & Oncology, Department of Medicine, Massachusetts General Hospital, Boston, MA
[12] Harvard Medical School, Boston, MA

Introduction: Use of validated risk stratification tools for work up of suspected pulmonary embolism (PE) is an endorsed recommendation of the American Society of Hematology and the American College of Emergency Physicians. Due to variations in clinical practice, electronic health record (EHR) systems, and medical provider trainings, the use, documentation, and implementation of these tools vary widely. Current processes do not allow for electronic capture and quality reporting at most institutions.

Methods: We sought to design and implement clinical pre-test probability (PTP) tools at three large healthcare institutions for use in emergency departments (ED). At each site, a hematologist partnered with ED physician leadership and local information technology experts to design and implement PTP tools in clinical workflows. Overall, 38 EDs (high volume tertiary EDs and smaller regional EDs) located in the United States along the East Coast and Midwest regions were involved. A major goal of implementation was integration into clinical workflow and automatic documentation. After design and implementation, awareness and education of the new EHR tool was distributed electronically to ED providers. After implementation, use of PTP tools was analyzed between September 12, 2022 and January 11, 2023. PTP use was examined as percent of visits for which patients underwent CT pulmonary angiography (CTPA).

Results: Each institution chose the 3 tier Wells' Score for implementation while one site designed an integrated Wells'/PERC or YEARS score calculator. Two sites implemented the tool as an optional flowsheet and one site implemented the tool as mandatory parameters within the orders for PE imaging studies. The mandatory tool could be bypassed with prespecified selections or if a D-dimer existed within 48 hours **.** Complete details of the site-specific implementation are shown in Table 1. Over the 4-month evaluation timeframe, there was a total of 270,214 ED encounters. Uptake and utilization of the PTP tools are shown in Table 2. Use of PTP was highest at the site with forced PTP documentation which ranged from 49-53% of ordered CTPAs, compared to Site 2 where use was 2-3%, and Site 1 where use ranged from 1-3%. At Site 1, use of PTP increased slightly over the study period with signs that PE yield on imaging was increasing as well (3.4% to 5.9%). At Site 2, PE yield on imaging was overall high (9-10%), and remained similar with similar use of PTP tools over the study period. Use of PTP and PE yield (6-8%) on imaging also remained similar throughout the study at Site 3.

Conclusion: Forced use of PTP within the orders for CTPA led to the highest use of PTP (Site 3) but this did not result in meaningfully higher PE yield on CTPA compared to the other sites. PE yield at each site was at or above the 5% yield for PE

on CTPA which has been previously reported. Given that PTP uptake was relatively stable over the measurement period at Site 2 and 3, this indicates the process had mostly stabilized and that other strategies are needed to improve uptake of PTP, reduce utilization of CTPA, and further increase yield on CTPA. Increasing PTP use and rising PE yield at Site 1 demonstrated ongoing potential for improvements past this study timeframe.

Disclosures Rosovsky: *Inari:* Consultancy; *Pulmonary Embolism Response Team:* Membership on an entity's Board of Directors or advisory committees, Other: President-Elect; *BMS:* Consultancy; *Dova:* Consultancy; *Janssen:* Consultancy, Other: Research funding is to my institution, Research Funding; *Abbott:* Consultancy; *Penumbra:* Consultancy, Other: National Lead Investigator for STORM PE.

Table 1. Clinical Pre-test Probability (PTP) Implementation Comparison

Implementation Characteristic	Site 1	Site 2	Site 3
Location in EHR	Scoring tools flowsheet	Flowsheet in "navigator" tab with other scoring tools for ED clinicians	Only available when ordering CTPA
Date PTP available to ED clinicians in EHR	8/10/22	9/5/22	6/1/2022 (Implemented earlier to alleviate contrast shortage)
Date ED clinicians first educated about PTP	9/7/22	9/5/22	6/1/22
Versions available	3-tier Wells PERC	3-tier Wells', PERC, and YEARS algorithm combined	3-tier Wells'
Prompts to complete PTP	No prompt, clinician must find PTP on their own	No prompt, clinician must find PTP on their own	Pop-up box when ordering CTPA; allowed to bypass if D-dimer present in prior 48 hours
Auto-population of fields	All fields must be entered by clinician	Age, pregnancy status, heart rate, and oxygen saturation auto-populate; scans for other variables if available in EHR and flags for clinical review of accuracy; any fields not populated must be entered by clinician	All fields must be entered by clinician
Score calculation method	Calculated automatically by EHR when all questions complete	Calculated automatically by EHR when all questions complete	Clinician calculates score; EHR does not have a location to capture score
Interpretation method	Clinician matches score with interpretation provided in text	Assigned by EHR based on PTP score along with recommendation for further diagnostic testing as needed	Clinician matches score with interpretation and enters that in a prompt

Table 2. Clinical Pre-test Probability (PTP) Uptake and Utilization

	Site	Sep	Oct	Nov	Dec	Jan
Total ED visits, N	1	6,747	8,690	8,730	9,217	4,565
	2	16,590	26,416	26,253	26,256	10,117
	3	20,231	31,912	31,123	31,123	11,365
Visits with CTPA, N (% of total ED visits)	1	239 (3.5%)	249 (3.4%)	305 (3.5%)	331 (3.6%)	187 (4.1%)
	2	902 (5.4%)	1458 (5.5%)	1549 (5.9%)	1703 (6.4%)	660 (6.5%)
	3	665 (3.3%)	1064 (3.3%)	1047 (3.4%)	1171 (3.7%)	408 (3.6%)
Visits with PE diagnosis and CTPA, N (% of visits with PE among visits with CTPA)	1	8 (3.4%)	12 (4.1%)	16 (5.3%)	14 (4.2%)	11 (5.9%)
	2	87 (9.7%)	139 (9.5%)	137 (8.8%)	154 (9.0%)	70 (10.6%)
	3	55 (8.3%)	89 (8.4%)	79 (7.6%)	75 (6.4%)	34 (8.3%)
Visits with PTP and CTPA, N (% of visits with PTP among visits with CTPA)	1	4 (1.7%)	2 (0.7%)	10 (3.3%)	10 (3.0%)	6 (3.2%)
	2	19 (2.1%)	27 (1.9%)	34 (2.2%)	46 (2.7%)	13 (2.0%)
	3	343 (51.6%)	565 (53.1%)	518 (49.5%)	613 (52.4%)	209 (51.2%)

Figure 1

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