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## 803. EMERGING TOOLS, TECHNIQUES AND ARTIFICIAL INTELLIGENCE IN HEMATOLOGY

**Artificial Intelligence and Venous Thromboembolism: Talking to the Experts**

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**Background:**

Venous thromboembolism (VTE) is a significant cause of preventable death among hospitalized patients. Artificial intelligence (AI) and its sub-branch machine learning (ML) may be useful in standardizing and improving VTE management in hospitalized patients. To learn attitudes towards using AI for VTE, we previously conducted a national survey of 100 clinical informaticians recruited through professional organizations and a publicly available database listing recipients of National Institutes of Health informatics grant awardees (Lam et al, RPTH, 2023). For the current study, we interviewed a subset of these informaticians to explore their perspectives in depth on using AI in clinical decision making and VTE management.

**Methods:**

Survey participants interested in participating in interviews were asked to submit their email addresses. We then recruited these participants and asked them to recommend other informaticians who may be interested. We conducted 30-60 minute interviews via videoconference which were recorded and transcribed. Two coders separately reviewed the interviews using thematic analyses to develop a codebook. Codes were identified inductively and agreed upon by consensus. Once a codebook was agreed upon, it was used to code all interviews in duplicate.

**Results:**

Of 32 informaticians who were contacted, 11 agreed to be interviewed. The final participant group included 4 clinicians, 6 data scientists, and 1 biomedical/computational biologist. The major themes that emerged were that AI is a powerful tool to reduce clinician burden and AI is well suited to preventing and managing VTE, but bias in the creation of AI tools must be minimized. Since machine learning models increase accuracy and efficiency in clinical practice, they can serve as decision support and management tools and help to improve communication thereby reducing clinician burden. (Table 1)

Other than the ethical concerns regarding bias, subpar quality of training data and model inaccuracy were identified as potential challenges. ML tools need to be validated as safe and effective for their specific role. In addition, one theme highlighted that clinicians fear being replaced by AI, while another noted that most patients would prefer interacting with humans about their medical care over AI. There were multiple suggestions for implementation of AI. Participants noted that AI could be integrated into the EMR and that ML tools should be further investigated with input from domain experts (data scientists, computational biologists and clinicians). Finally, interviewees recognized that VTE management was an area of medicine in

which AI could be used successfully given that it is a clearly defined problem that lends itself to an algorithmic solution which can incorporate the current guidelines into a tool within the EMR system.

Conclusion:

Informaticians see AI as a promising tool to support clinical decision making about VTE prophylaxis because not only does it increase accuracy and efficiency, but it is also a clearly defined area of clinical management where guidelines can be effectively incorporated into the EMR system via machine learning. Challenges identified to implementing AI/ML will have to be addressed in order to create an ethical and accurate model which reduces the burden on healthcare providers in the clinical setting.

**Disclosures Rosovsky:** 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; **Inari:** Consultancy. **Zwicker:** CSL Behring: Consultancy; **Pfizer/BMS, Portola, Daiichi:** Honoraria; **Sanofi, CSL, Parexel:** Consultancy; **calyx:** Consultancy; **Incyte Corporation, Quercegen:** Research Funding; **Janssen:** Consultancy; **Sanofi:** Consultancy.

Table 1. Key themes relating to strengths and barriers of artificial intelligence for venous thromboembolism management with sample quotes from informaticians' interviews.

	Theme	Example
<b>Perceived strengths of AI</b>		
1	Reduces clinician burden	"I've seen people eager to engage with AI with respect to sort of lifting burdens in terms of things like prior authorization, various like doctor letters that they have to provide for patients..." (Participant #5).
2	Increases efficiency	"If it (AI) passes quality control and you know you can trust it, then it can become a way to make things more efficient" (Participant #1).
3	Increases accuracy	"We have found that our AI models in short term are better predictors than the ordinary differential equation models" (Participant #2).
4	Supports decision making	"[AI] has the potential to have a positive impact, especially if it's used as another tool to support diagnosis and clinical decisions" (Participant #1).
5	Improves communication	"... I could see people using it as a resource for learning more about treatments, about their condition... it's hard for a patient to remember all of the things that they need to talk about or to think of every question they might have right in that encounter, so it might be a good way to get more information about diagnosis as those questions come up" (Participant #5).
<b>Perceived barriers to implementing AI</b>		
1	Quality of training data	"...if you put bad data in you get bad results out, so the quality of the data set [matters], which is very difficult in healthcare settings because all of the data is not structured" (Participant #2).
2	Ethical concerns	"... there certainly needs to be some sense of how a given AI will perform across different groups, whether those are defined by age or race or gender or whatever other factors. And so, I think that, you know, if there's an AI that performs poorly in a particular group, worse than physicians perform now, I think that we would have to develop probably reconsider the AI" (Participant #5).
3	Model inaccuracy/false positives	"There are actually multiple examples now of what some of the people in the technology logs are calling 'hallucinations'. It's basically where Chat GPT is making stuff up" (Participant #7).
4	Worsens communication	"I think I would still be concerned that the chatbot might not be able to respond in a way that even if it was more empathic, they're just looking at the text up front, it might not necessarily be able to respond to where the patient was at that particular point in time in terms of their thinking" (Participant #7).
5	Patients prefer human communication over AI	"I don't think you'd ever eliminate the personal interaction that you have with a physician if you have one. I think it would be very hard to duplicate that" (Participant #6).

Figure 1

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