

**Webinar Questions: Unlocking the Power of AI in Sepsis Care**

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Presenters: Michael Hooper, MD, MSc and Scott Stewart, LSSBB, PMP, CSM

Question	Answer
What is the patient population included in your sepsis mortality?	<p>Aside from what our Inpatient AI tool looks at for purposes of preventing hospital acquired sepsis, our general sepsis mortality population for the 2019 company goal consists of all cases of documented sepsis in either the primary or secondary diagnosis in the EMR for patients who are aged 18 years or greater and have a length of stay of 120 days or less. This includes cases that were present on admission in the emergency department and cases that were hospital acquired.</p> <p>If DNR is documented prior to admission or is a part of the admit order, the patient is excluded from the metric. If a patient is going to hospice and has hospice documented in the chart during the length of stay prior to discharge, they are also omitted from the metric.</p>
Can you give an example of the data that indicates a predisposition to sepsis?	<p>The tool we have looks at 4,500+ clinical and socioeconomic factors per patient and compares them to millions of other patients that ended up with sepsis to see what they have in common and calculate a risk propensity (high/med/low). Clinical factors would include existing infections, recent clinical history, and current lab values and trends. Socio-economic factors would include data such as age, ethnicity, caregiver status, living conditions and dispositions (home, home with home health, resident of skilled nursing facility).</p>

What's the sensitivity and specificity of this model?	In a recent retrospective 5 month review of data (go-live was in February), the tool has accurately predicted a high amount of sepsis cases, although not all were hospital acquired and were patients that already had sepsis upon arrival at the ED. The tool triggered an alert on a number of other cases where patients did not have sepsis nor did they end up with hospital acquired sepsis which is where we still need to analyze the AI paradox (how many of these were prevented cases versus how many were not headed towards sepsis and would not have gotten it regardless of hypervigilance suggested by the alert.)
What about academic research and validation of the models and workflows?	Please reach out to Sepsis Alliance to meet up with JVION (our AI vendor) who can help you setup a demo.
What metrics are you tracking at Sentara?	All sepsis mortality within our denominator, hospital acquired versus present on admission, cases, execution of the internal sepsis screening process in the ED, execution of response to alerts in the ED, execution of IV push utilization in the ED, execution of sepsis screening in the inpatient population, execution of response to inpatient alerts in the EMR, sepsis orderset utilization and nurse intervention protocols.
Are you using the EPIC Sepsis Predictive Model or one you designed yourself?	We are using an inpatient sepsis "sniffer" which we designed in-house at Sentara. We are aware of the Epic Sepsis Predictive model and are running it in the "background" for a future study.
What electronic medical record are you using? Is the AI built within the EHR or is it a separate tool that scans the EHR?	We are using Epic, the AI machine is a separate entity that exchanges data with Sentara through secure HL7 files. We built workflows to conveniently tie suggested interventions from the machine into day to day provider and nurse operations within Epic.
What population was the algorithm(s) based on?	We are using the AI algorithm to scan all patients who are in an "inpatient" status so predominantly focused on admitted

	patients. However, the tool does scan patients in the ED who have an admit order placed but have not yet received a bed (boarders).
If you didn't use symptoms, can you give some examples on what you did use?	The clinical and socio-economic factors used are propriety to the AI company but some examples would be age, ethnicity, living conditions, caregiver status, recent medical history, known infections. There are over 4,500 similar data points for each patient.
How much time ahead can predictions reg. sepsis be made?	The JVION tool can predict a patient is headed towards hospital acquired sepsis anywhere from 8-12 hours prior to onset of symptoms.
How long before you noticed any change in your metrics?	For a 12 hospital system to adopt the technology, build buy-in, and execute change management post go-live, it took 3-4 months to see results. However, the results could be attributed to a number of things that are not related to AI.
Is there a demo for AI tool developed?	Please reach out to Sepsis Alliance to meet up with JVION (our AI vendor) who can help you setup a demo.
What options or techniques do you see as an answer to antibiotic stewardship versus Sepsis?	Striking a balance between the need to quickly and liberally give antibiotics in patients with sepsis versus the need for overall judicious use of antibiotics is an important topic. I think there are two key concepts/techniques to apply: <ul style="list-style-type: none"> <li>- When a patient may have a life-threatening systemic infectious process (i.e. sepsis), quick administration of appropriate antibiotics is necessary. This saves lives and cannot be overlooked. We realize that some of these "potentially" septic patients may end up with a non-infectious etiology of their physiologic derangement. We also realize that many will have a specific infection that can be treated with narrow-focused coverage.</li> </ul>

	<p>- That is why it is important to reassess the use of antibiotics daily so appropriate de-escalation can occur.</p> <p>Appropriate antibiotic stewardship should not delay the administration of broad spectrum antibiotics to patients suspected to have life threatening infections.</p>
Have you seen an impact in your rate of sepsis or sepsis mortality after introducing AI to your health system?	Yes, since deployment of the tool earlier this year we have seen improvement. However, we are not sure how much of this improvement is attributed to our AI deployment at this time.
How are you integrating this tool in an ER encounter?	When the AI tool finds a patient that is at high risk for developing sepsis in the hospital, it launches a best practice alert in Epic which contains links to clinical pathways to execute certain interventions suggested by the machine for mitigating the risk.
Have any of your facilities implemented the Sepsis bundle surrounding AI recognizing or being triggered before symptoms presented?	Yes. All of our facilities currently have an AI system in place that alerts providers of patients who are at a high risk of developing sepsis (but are not yet septic). Now, many of those patients may have "symptoms", but they often do not yet have sepsis. While there is some debate on whether or not these cases can be "prevented", we have implemented a number of common-sense interventions in hopes of preventing sepsis. We also feel it is important to heighten awareness of our high risk population so that they can be monitored more closely.
What "glitches" did you come across with the roll out?	On occasion the tool would suggest a patient is high risk for hospital acquired sepsis on the day of discharge. We also removed some units from the scan like labor and delivery and inpatient rehab to prevent firing the alert In less likely scenarios across the hospital.
Where are the end users alerted? For example, where are RNs alerted in EPIC?	The alerts pop up for the RNs and MDs upon entering a patient's chart. The clinician is then directed towards certain clinical pathways which are linked to the alert.

What messaging or methodology did you use to prime the culture across the many levels of care and care providers?	We used a lot of internal marketing through our own nurse teaching council which is a team of educators at every hospital. We also used internal publications such as physician eCare news and also hospital specific newsletters. We also presented at several internal councils and forums and sent many communications through various email chains.
What percentage of your patient did this trigger? How many specific and automatic interventions were suggested per patient?	A smaller percentage of patients are triggered by the tool. We opted to only look at high risk patients to perform interventions, other companies may pursue interventions on medium and low which would lead to more firings and resource demand. We found by using the high risk band, we captured most of the opportunity. The tool offers 7 standard interventions and 9 stack ranked interventions specific to the patient's needs.
Have you considered using any lab values in the model?	Yes, lab values are already considered in the model.
Has your case study included any tools to manage the execution of the clinical pathway in order to improve adherence to the sepsis protocol, or even to dynamically adapt the workflow for specific situations?	Yes, we are able to measure if the different interventions are completed by looking at how the alert was acknowledged in the EMR and also what was ordered for the patient.
Will other areas be updated on risk for survivors: respiratory, community health, outpatient or day surgeries or procedures?	Yes, the risk score stays in the patient's chart for other clinicians to see.