

SAEM 22

Emergency Medicine Resident Use of Electronic Differential Diagnosis Generator When Evaluating Critical Patients

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Disclosures

- None

The Initial Evaluation

- How do you begin working up critically ill patients?
- Presenting symptoms, Vitals, HPI, Physical exam, response to interventions, diagnostic evaluation
- Creating a differential
- Make the Diagnosis
- How has that process changed as you have advanced?

WHY?

- Differential diagnosis generation is a vital skill for emergency medicine residents to develop in the care of critical patients.
- Electronic DDX tools allow a physician DDX to be cross-checked with an artificial intelligence to broaden the DDX and may aid in EM resident DDX generation when caring for a critically ill patient.
- DDX tools were developed for broad clinical application, and not specifically for the emergency department setting or for high-acuity scenarios.
- It is unclear if DDX tools may benefit EM trainees in the evaluation of the critically ill ED patient. We aimed to evaluate the use of a DDX tool by EM residents in the high-acuity area of an ED to determine its impact on resident diagnosis and testing.

HOW?

- We performed a prospective observational study on usage of a DDx tool (Isabel © Isabel Healthcare 2021) in the high-acuity area of a tertiary care, academic ED (annual census 130,000) for patients requiring immediate evaluation.
- The tool was evaluated in the high acuity area of the ED by a resuscitation resident rotating each month in the area. For each critical patient encounter they participated in, the resident completed a data collection tool that included details of when Isabel was utilized and when applicable the query results.
- Data was summarized by frequencies. Chi-squared or Fisher's exact tests were used to assess the association of additional testing and added value of a DDx tool.

Patient Label

Isabel Utilization Form

Did you use Isabel? Yes No

If no, Go to bottom of page

MRN: _____ Age: _____ Sex: _____ (If no sticker available)

Arrival Method: _____ Primary Language: _____

CC: _____

COVID risk? Low Mod High

Top Diagnoses Pre-Isabel

Resuscitation Resident

Attending

When queried, did Isabel aid in diagnosis? Yes No

Comment:

Add differentials that were not considered? Yes No

Comment:

Did it lead to additional testing? Yes No

Comment:

With results, did you query Isabel again? Yes No

Comment:

Final Admitting Diagnosis: _____

If Isabel was not used please indicate why:

Forgot Busy Diagnosis apparent

Other please indicate: _____

With many thanks: Dr. Todd, Dr. Berger, Dr. Booher



Clinical features

Age of the patient *

Adult 40-49yrs 

Patient's sex at birth

Female

Male

Is the patient pregnant?


Not Pregnant 


Patient's travel history

North America 

Enter abnormal clinical features in free text **OR**
select from list. **NO** negatives:

chest pain 

hemoptysis 

tachycardia 

shortness of breath 



Enter clinical features e.g. chest pain

Get Checklist

[Clear](#)

MERCK MANUAL

Professional Version

For Evidence Based
Knowledge

Search Merck Manual Professional

Search

isabel

For Knowledge Search

Enter keywords

Search

Isabel on your mobile 




URL: www.isabelhealthcare.com

User ID: 60080

Password: isabel20!

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Enter clinical features

Get Checklist








































[Clear](#)


Checklist

Ranked Diseases Drugs

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Show 10 Show All Red Flag

-  **Pulmonary Thromboembolism**  Resp   
-  Pulmonary Embolism and Infarction   
- Pulmonary Edema**  Resp   
-  Lung Neoplasms Resp   
-  Heart Neoplasms Cardio   
- Pulmonary Hypertension** Cardio   
-  **Ischemic Heart Disease**  Cardio   
-  Myocardial Infarction / Acute Coronary Syndrome  
-  Pneumothorax Resp   
- Myocarditis** Cardio   

 Tap on disease name to explore.

Isabel on your mobile 



URL: www.isabelhealthcare.com
 User ID: 60080
 Password: isabel20!



Results

- Over the 8-month study period, the DDx tool was used by the resuscitation resident for 98 critical ED patients, of whom 60.2% were female, 7% were pediatric, and 46% were over age 65.
- Querying the tool led to a diagnosis not initially considered by the resident in 47% of cases. Additional diagnostic testing was ordered based on the tool's output in 4% of cases.
- Residents felt the tool added some value to their patient evaluation in 8% of cases and were more likely to give it this rating if the tool's output led to a diagnosis not considered ($p < 0.001$) or altered diagnostic testing ($p = 0.05$).

Conclusion

- DDx tools have the potential to improve EM resident DDx generation in the resuscitation setting by expanding the differential diagnosis and, to a lesser extent, altering diagnostic testing.
- Further research is needed to optimize such tools specifically to the ED and critical care settings to improve their utility in these environments.



Questions?