Sepsis Screening Tools

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Case

Mr. H is a 67-year-old man status post hemicolectomy four days ago. He was transferred from the ICU to a medical-surgical floor at 1700 last night. Overnight the nurse called the house officer regarding urine output less than 0.5ml/kg/hr and tachycardia of 105 beats per minute. The house officer ordered a one liter NS bolus. This morning the patient is exhibiting signs and symptoms of severe sepsis, including temperature103.5°F, HR 117 beats per minute, mean arterial pressure 58 mmHg, decreased level of consciousness, and decreased urine output. His WBC is 21,000/µL. The patient is now critically ill and is being transferred to a critical care unit. Could there have been a better way to identify the problem the night before and intervene before this change in status became severe?

Discussion

Scenarios like the one above occur commonly in hospitals. A study of septic patients in a surgical intensive care unit (SICU) showed that 47% of the patients admitted with sepsis, severe sepsis, or septic shock came from a surgical floor [1]. Patients who develop sepsis as inpatients present different challenges from patients who present to the hospital with sepsis.

According to the Institute for Healthcare Improvement (IHI), the incidence of sepsis has increased to 750,000 new cases per year with at least 210,000 fatalities [2]. Seventeen percent of hospitalizations with the diagnosis of septicemia or sepsis result in death compared with only 2% of other types of hospital admissions [2]. Besides having a high mortality rate, sepsis can cause long periods of debilitation. Thirty-six percent of patients hospitalized with sepsis are transferred to other facilities, such as long term care, compared to 14% of other types of inpatients. Implementation of Early Goal Directed Therapy (EGDT) improves sepsis survival [3]. However, early recognition of sepsis in the inpatient setting can be a challenge.

Early recognition of sepsis is imperative in improving mortality rates. A 2001 study showed improvement in mortality rates only if EGDT is initiated within six hours [4]. The challenge is the complexity of sepsis which prevents early recognition from occurring consistently, particularly on medical-surgical units. However, clinical knowledge alone does not guarantee sepsis will be recognized. The clinician must have time to review patient data and determine whether the patient has signs of sepsis. This is challenging in today's fast-paced clinical environment. The complexities of sepsis recognition can be overcome by implementing a systematic recognition program for sepsis. Screening tools are widely available and are effective in the recognition of sepsis [4-6].

It is important for each healthcare facility to choose a method for screening which is congruent with the workflow of the facility. A few of the considerations include:

1. Who should do the screening?
2. How often should the screening be done?
3. Should the screening be done on paper or electronically?

Although physicians and other healthcare providers have the ultimate responsibility in determining if a patient is septic, their contact with the patient is

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DOI: 10.12746/swrccc2013.0103.027

limited compared to the contact the nursing staff has with the patient. The requirement for early recognition makes it necessary for the nursing staff to be able to recognize potential sepsis in the patients and report findings to healthcare providers. Many institutions utilize the primary nurse for completing screening tools while others use charge nurses or rapid response teams [7,8]. The frequency of screening is also a difficult question because some of the SIRS criteria, such as lab values, would have data points only once a day, while others, such vital signs, have more continuous assessments. Studies have examined screening tools used at a wide range of frequencies. Some screening tools are completed only on admission and with any sign of patient deterioration; others are done every time a new set of vital signs is entered into the medical record. Hospitals still using paper charting will implement a paper sepsis screening tool. Hospitals with electronic medical records may consider partially automating the screening tool using data already entered by nursing and ancillary staff. A multidisciplinary team should be formed in each institution to determine the best method for sepsis screening for the facility [7].

The University Medical Center Health System Critical Care Collaborative is a multidisciplinary team formed to improve the quality of critical care delivered in the facility. The Collaborative determined the need for a sepsis screening tool and developed one individualized for the facility based mostly on the screening tools available on the IHI website (Figure 1). The screening tool was completed by the primary care nurse on admission to the intensive care unit to determine its potential utility. After a one month trial it was determined the tool was adequate for identifying sepsis. However, use of the tool was not consistent because the tool was on paper and our hospital utilizes an electronic medical record. The Critical Care Collaborative worked with information technology professionals to develop an electronic sepsis screening tool. This tool works by "firing a rule" every time a nurse completes a head to toe assessment on the patient. The rule prompts the computer system to look for criteria identifying sepsis as the paper sepsis screening tool does. If the patient is identified as potentially having sepsis according to the computer, a task is "fired" for the primary nurse to complete a sepsis screening tool. Figure 2 is a screen shot of the electronic sepsis screening tool. Only time will tell if the electronic sepsis screening tool will be effective for the UMC Health System. Adjustments may be needed to create the most efficient and accurate sepsis screening tool. Continuous evaluation of the tool's effectiveness by the multidisciplinary Critical Care Collaborative will insure a method for improving the recognition of sepsis in our healthcare facility.

Key points

1. Sepsis has a high morbidity and mortality.

2. Inpatients who develop sepsis may have delays in evaluation, testing, and treatment.

3. Sepsis screening tools based on SIRS criteria can provide a rapid method to help identify sepsis.

4. These tools are potentially useful for all health care providers but need to be used consistently.

Key words- sepsis, screening, electronic record, surviving sepsis guidelines

Figure 1. Paper Sepsis Screening Tool

Place Patient Label Here

University Medical Center Adult ICU
Sepsis Screening Tool

Step 1:

Is the patient already being treated for sepsis? _____**Yes** _____**No**
If answer is yes, STOP.
If answer is no, CONTINUE to step 2

Step 2: (Two or more of the following)

A)	**Sepsis Criteria**	**B)**	**Other possible indicators**
_____	Temp > 100.9 or < 96.8 (in the last 24 hours)	_____	Acute change in Level of Consciousness
_____	HR > 90 (in the last 24 hours)	_____	Glucose > 120 in non-diabetic
_____	Respiratory Rate >20 or PaCO2 < 32 (in the last 24 hours)		
_____	WBC >12000, < 4000, or > 10% Bands		

If less than two items checked, STOP.

Step 3: Infection (Suspected or Confirmed)
Does this patient have a suspected or confirmed source of infection? _____**Yes** _____**No**
(Such as: Pneumonia, Invasive Catheter, UTI, Decubitis Ulcer, Acute Abdomen, Colitis, Meningitis, Pancreatitis, Cellulitis, Bone/Joint, or Wound)
If answer is NO, STOP.
If answer is YES, continue to step 4 and contact physician if necessary. The patient may have SEPSIS.

Step 4: Organ Dysfunction

_____ Acutely altered mental status
_____SBP <90 or MAP <65
_____ SPO2 < 90%
_____Creatinine > 2 mg/dl or urine output < 0.5 mg/kg/hr
_____ Platelet count < 100,000
_____ Bilirubin >2mg/dl, AST>90, ALT >90
_____ Lactate > 2mmol/L

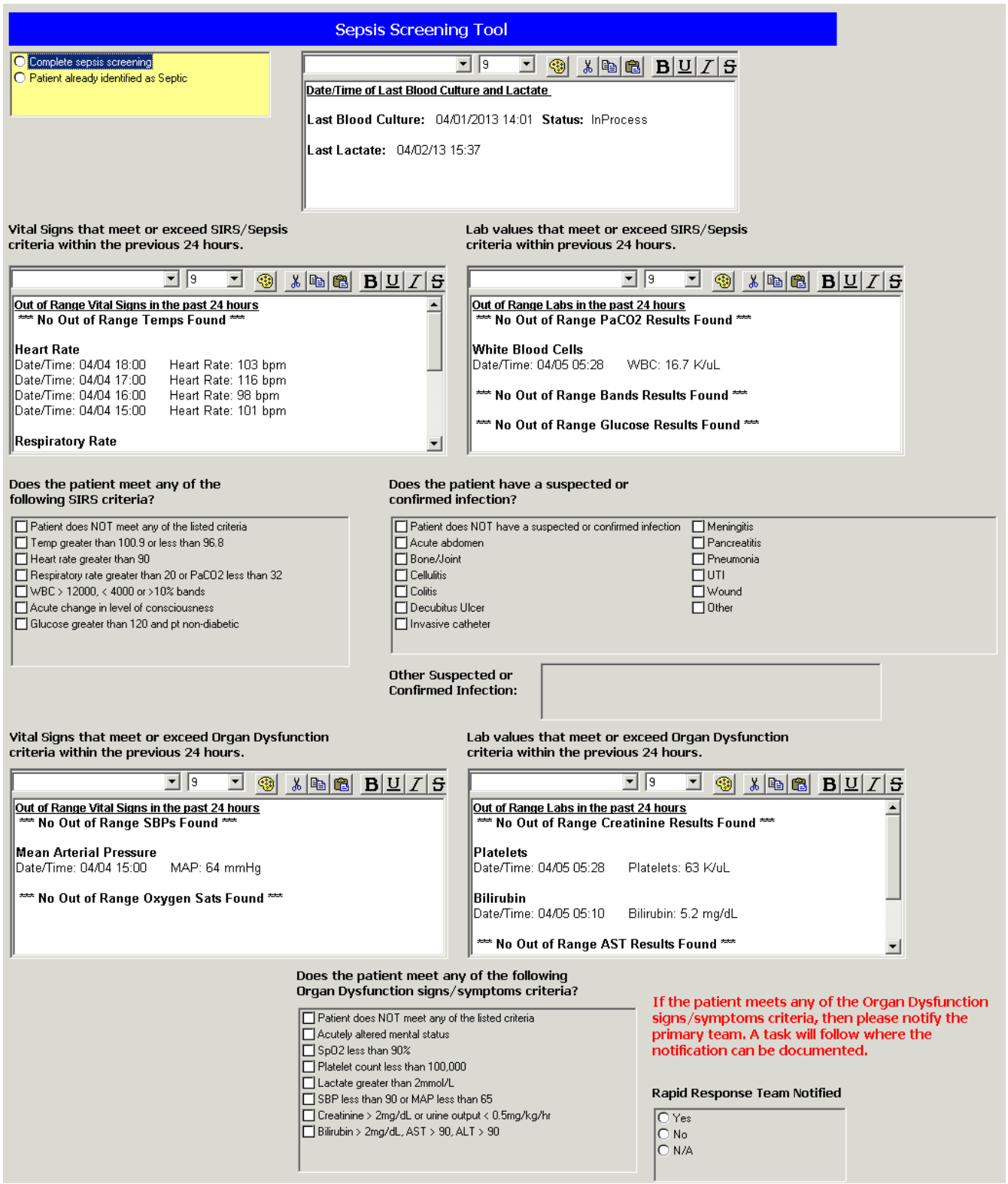
If one or more items are checked the patient may have SEVERE SEPSIS.

Step 5. If patient screens positive for SEPSIS or SEVERE SEPSIS, CALL PHYSICIAN NOW (if not already aware).
_____ Early Goal Directed Therapy for Adult Sepsis orders were implemented
_____ Early Goal Directed Therapy for Adult Sepsis orders were NOT implemented
WHY_____

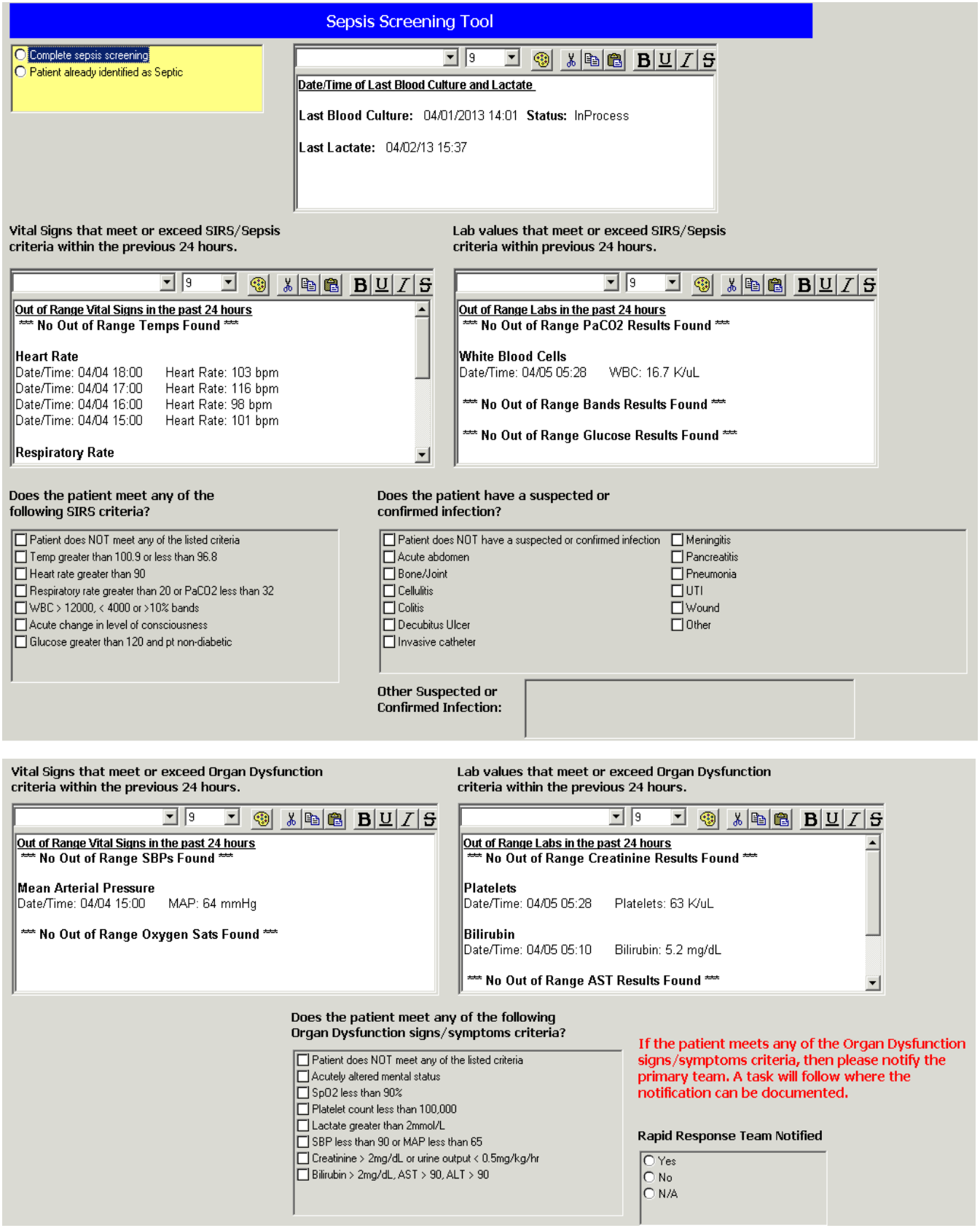
Date _____ Time_____

Not Part of the Medical Record

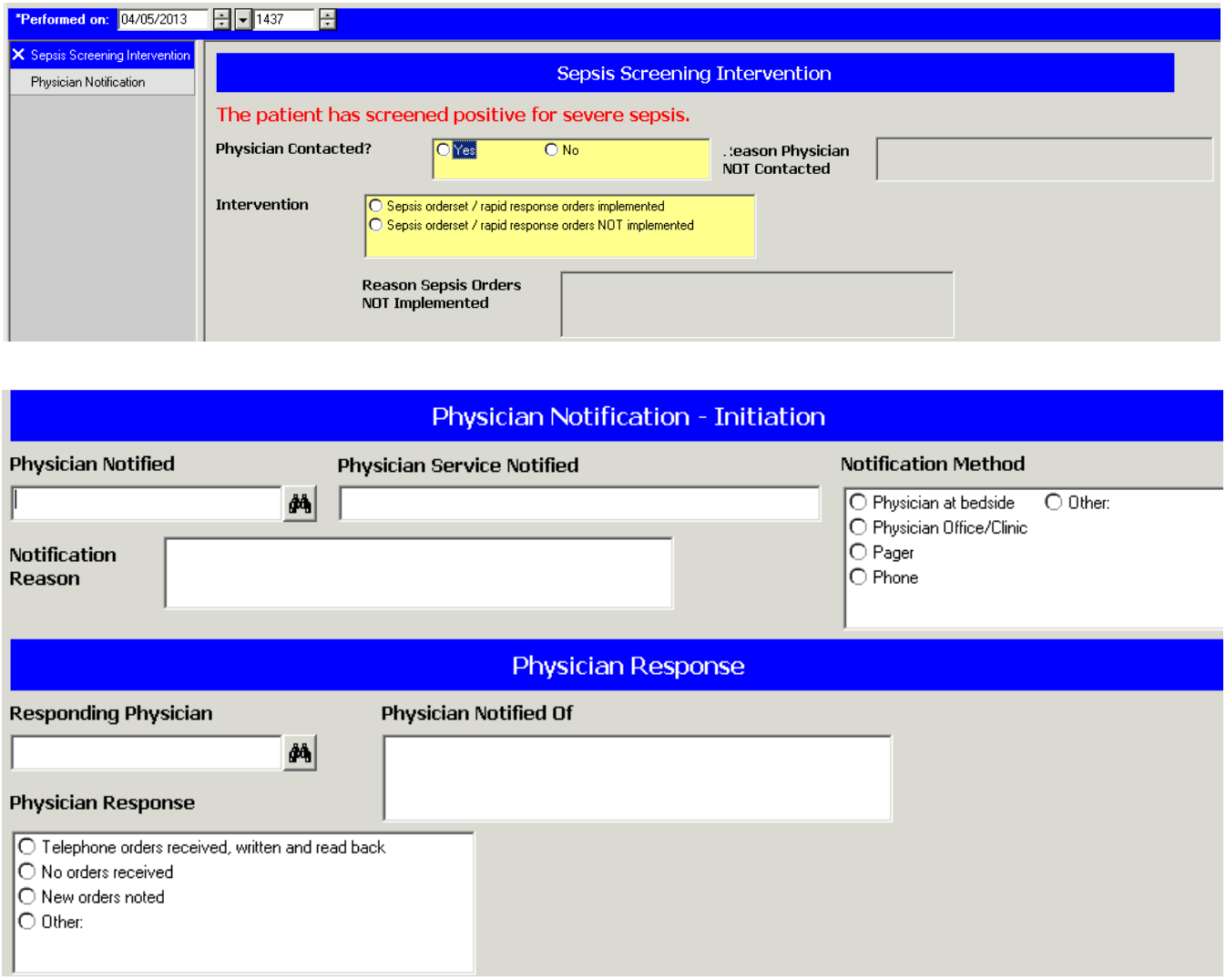
Figure 2. Electronic Sepsis Screening Tool
Sepsis Screening Tool (Complete form)



Sepsis Screening Tool (In Sections)



Sepsis Screening Tool (In Sections)



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Received: 1/23/2013
Accepted: 6/3/2013
Reviewers: R Alalawi MD, K Nugent MD
Published electronically: 7/15/2013
Conflict of Interest Disclosures: None

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