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Evaluating a digital sepsis alert in a multi-site hospital: a natural experiment

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Evidence of infection response

Temperature	>38.3°C or <36°C
Heart rate	>95 beats/min
Respiratory rate	≥ 22 breaths/min
WBC	>12,000 or <4000 cells/mm ³
Glucose	<141 and >200 mg/dL

≥2 criteria

Evidence of organ dysfunction

SPB	<90 mmHg (30 hours)
Lactate	>2.0 mmol/L (12 hours)
Bilirubin:	2.0 mg/dL and <10.0 mg/dL (30 hours)
Creatinine:	Increase of ≥0.5 mg/dL from base-line (72 hours)

≥3 criteria
infection response

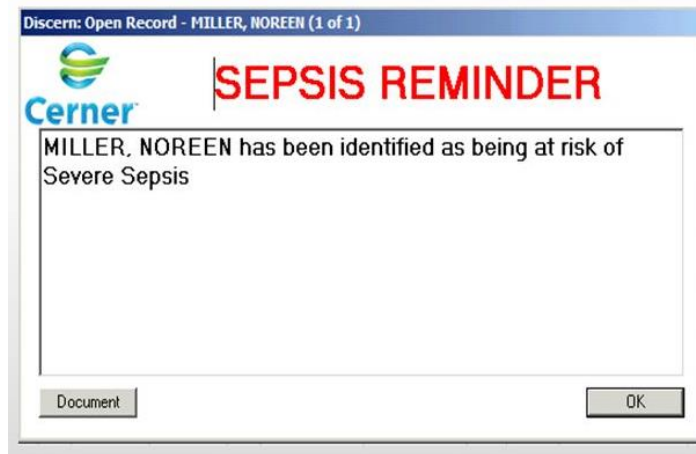


*Suspicion of
sepsis*

≥2 criteria
infection response
&
≥1 criteria
organ dysfunction



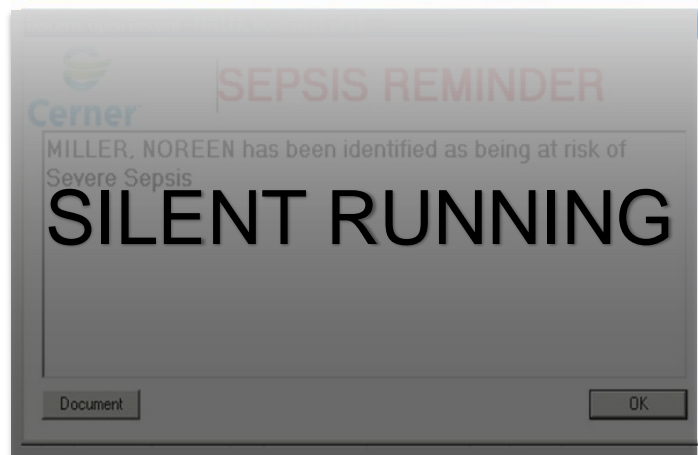
*Suspicion of
severe sepsis*



Care provided by hospital staff
treatment plans associated with alert

Alert recorded in patient EHR

INTERVENTION GROUP



Care provided by hospital staff

*SILENT Alert recorded in patient
EHR*

CONTROL GROUP



HAPPY STATISTICIAN

NATURAL EXPERIMENT



Methods

Key outcomes – *informed by national targets*

- In-hospital mortality within 30-days
- Prolonged hospital stay ≥ 7 days
- IV antibiotics within one hour of alert

Methodology

Inverse probability of treatment weighted multivariable logistic regression was used to adjust for confounders.

Confounders included age, comorbidities and severity.



Results

In-hospital mortality in 30 days – *all patients*

Reduction from 6.4% to 5.1%

Lower risk of death - 24% lower

Prolonged hospital stay (≥ 7 days) – *patients admitted through the ED*

Reduction from 41.1% to 40.2 %

Lower risk of extended stay - 4% lower

IV antibiotics (within one hour of the alert) – *patients admitted through the ED*

Increase from 36.9% to 44.7%

Increased chance of receiving timely antibiotics - 35% higher



Conclusion

Introduction of the sepsis alerting system is associated with improved outcomes for patients

What is the mechanism of improvement?



What is the mechanism of improvement?

Behaviour change



Rapid antibiotics

Highlights ill
patients

Improves
communication

Treatment plans



Is it sepsis?

EHR/alert training
=
sepsis training



What next?

Health

Sepsis myths create 'unhealthy climate of fear', say experts

Researchers say figures are often inflated and rush for antibiotics may fuel resistance

Sarah Boseley
Health editor

Fri 25 Oct 2019
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The Guardian



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