

Interdisciplinary care and artificial intelligence to improve time to appropriate antibiotics in septic patients

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Background

- Sepsis is a response to infection that can result in impairment of an organ system or systems. If not identified quickly, this can be life-threatening. Delay in appropriate antibiotic therapy results in an increase in mortality. Rapid identification of septic patients can help decrease the time to appropriate treatment.
- Wolters Kluwer Point of Care Advisor provides a unique notification system to help determine if the patient is septic. By taking information from the patient's chart, it reduces alert fatigue by identifying truly septic patients.

Citations:
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Disclosure

Authors have no relevant financial relationships to disclose.



Methods

Wolter's Kluwer Point of Care Advisor was implemented in the Guthrie Robert Packer Emergency Department in June 2020.

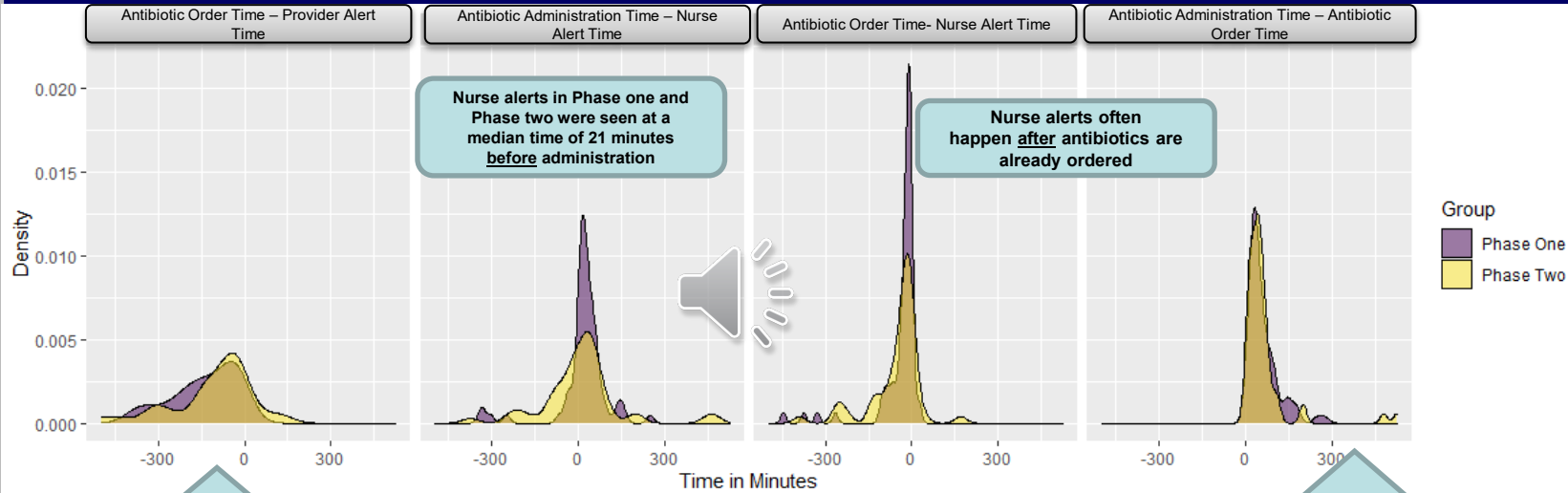
Phase I:

- All patients that had an alert from Point of Care Advisor from June 23rd to July 28th, 2020 were assessed on time of antibiotic order to administration.
- Antibiotic appropriateness based on indication was assessed as well.
- Appropriateness was determined by using the revised sepsis order set.
- Date and time of Point of Care Advisor alert to both nurses and providers was collected in respect to antibiotic order and administration time.

Phase II:

- A pharmacist reviewed the Point of Care Advisor Care Monitor from 3-5pm Monday through Friday and responded immediately to severely septic patient alerts. Phase two was from November 30th, 2020 to January 8th, 2021.
- Due to a low number of patient's cared for, the patients assessed in phase two were taken from the Point of Care Advisor analytics page. The analytics page assessed bundle compliance in patients that were considered severely septic.
- Charts were assessed for time from antibiotic order to administration.
- Appropriateness of antibiotics based on indication was determined using the sepsis order set.
- Date and time of Point of Care Advisor alert to both nurses and providers was collected in respect to antibiotic order and administration time.

Phase One Compared to Phase Two Results



Alerts to providers frequently occur after antibiotics have already been ordered. Phase two showed a shift towards earlier time providers are seeing this alerts, but still after antibiotics have been ordered

Appropriateness of antibiotics varies based on indication

Phase two order to administration time was consistent with Phase One. Median time from antibiotic order to administration was 43 minutes

Indication	Number Appropriate Phase 1	Number Appropriate Phase 2	P value
Pneumonia	12/21	8/13	1*
Urinary Tract Infection	19/19	6/8	0.08*
Cellulitis	6/7	4/6	0.559*
Extra Biliary	12/15	1/3	0.172*
Biliary	1/2	0/1	1*
Sepsis Undefined	5/5	7/14	0.106*
Other**	5/9	9/13	0.662*

*P values show no significance with Fisher's Exact test of independence

**Other included the following indications: Potential sepsis, neutropenic fever, COVID19, DKA with positive SIRS, Obstruction, Prosthetic joint infection, Endocarditis, Otitis extern, diarrhea of infectious origin, COPD exacerbation, abdominal wound, surgical site infection, osteomyelitis

Conclusion

- The median time from antibiotic order to administration was consistently within 1 hour. However, time of recognition of sepsis was unable confidently determined.
- Delayed alerts to providers and nurses indicate that workflow changes in the emergency department should allow for more information to be given to Point of Care Advisor.
- An antibiotic order may be the first signal to Point of Care Advisor that there is an infection present due to lack of other critical information.
- Point of Care Advisor can aid in the faster identification of septic patients before antibiotics are ordered if they are given information in real time.
- Appropriateness of antibiotics changed based on indication which provides an opportunity for a pharmacist to aid in the decision-making process.