Using clinical decision support to improve the care of patients with sepsis[1]

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"Over the first six hours after the onset of recurrent or persistent hypotension, each hour of delay in initiation of antimicrobial therapy was associated with mean decrease in survival of 7.6%."[2]

Background

Evidence suggests that early, timely and aggressive resuscitation for patients with septic shock can have significant impact on both morbidity and mortality[2]. However, even with the widespread awareness of the Surviving Sepsis Campaign (SSC) guidelines[3], adherence varies widely.

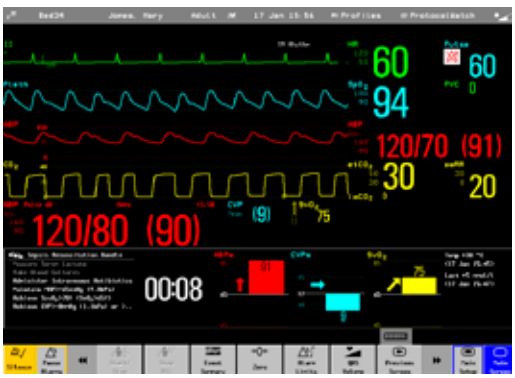
ProtocolWatch (PW) is a proprietary rules-based engine available in IntelliVue bedside patient monitors. The first application, ProtocolWatch Sepsis (PWS), is designed to support compliance with SSC guidelines. PW monitors the patients for the signs and symptoms of sepsis, and when patients meet the physiologic criteria as outlined by the SSC, a series of prompts are displayed on the monitoring screen to help guide clinicians through the evidence-based recommendations for resuscitation and management that have been endorsed by the SSC.

Purpose

The purpose of this research was to measure the impact that using PWS had to adherence to the SSC guidelines.

Methods

This non-probability, convenience sample consisted of critically ill adult patients (at least 18 years of age) admitted to two adult Intensive Care Units who were admitted with or developed sepsis during their ICU stay, including sepsis as an admission diagnosis. Post-surgical cardiac patients were excluded from the study. The final sample included 2 groups of septic patients, who were treated according to SSC guidelines. 65 patients (Group 1) were managed using a paper-based protocol , and 70 patients (Group 2) were managed using the PWS application in the Philips bedside monitor. Variables collected included all of the variables that are part of the SSC database.



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Results

Completion of resuscitation bundle significantly increased from 57.6% to 68% (p=.003). (Table 1)

Time to antibiotic administration was significantly reduced from 181.9 minutes to 112.3 minutes (p=0.02), representing more than a one hour improvement. (Table 1)

Conclusions

These results provide initial support that PWS, a semi-automated electronic version of the SSC guidelines, can increase compliance with SSC guidelines. Automatic physiologic criteria screening at the bedside monitor may also shorten the recognition time of sepsis, thus speeding up the initiation of sepsis treatment. Development of tools such as Protocol Watch will likely be an important adjunct to sepsis identification and treatment in the future.

	Years	APACHE II (points)	Resuscitation bundle completion (%)	Time to completion (hrs)	Management bundle completion (%)	Time to completion (hrs)	Time to antibiotic administration (min)
Group 1 (N=65) Prior to PW	67.6 (15.2)	21.4 (7.2)	57.6 (19.8)	13.8 (20.8)	84.5 (19.3)	22.2 (21)	181.9 (150.6)
Group 2 (N=70) After PW	69.1 (17.5)	22.3 (7.2)	68 (20) **p=.003**	12.7 (17.3)	86.8 (17.4)	19.2 (9.7)	112.3 (90.5) **p=.002**

Table 1: Mean and standard deviation values for age, APACHE II, and resuscitation/management and antibiotic administration bundle completion for initial subjects

References

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