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EVALUATION OF THE EXECUTION OF A SEPSIS CLINICAL PATHWAY IN THE EMERGENCY DEPARTMENT THROUGH PROCESS MINING TECHNIQUES

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ABSTRACT

Introduction: The evaluation of the execution of clinical pathways (CP) has several challenges including professional time constraints, lack of qualified resources, administrative burdens and absence of tools for evaluating and reporting. The aim of this work was to evaluate the execution of a sepsis CP from an adult emergency department of a Brazilian hospital through process mining techniques. In addition, we verified the research outcomes' utility with the hospital staff.

Methods: We applied process mining techniques using 2 years of sepsis hospitalizations extracted from the hospital information system. The hospital staff validated the accuracy and utility of the results.

Results: We identified the real sepsis treatment process that the hospital executes. The hospital staff performed the sepsis treatment process close to the one specified in their sepsis' CP (trace fitness of 0.85), indicating a very good adherence. We found 43 different types of deviations in the execution of the CP, constituting 5,184 deviations (instances). The bottlenecks in the process were: patients waiting in the reception for the triage (mean of 18 minutes) and the prescription of the treatment by physicians (mean of 5 minutes). The time to giving antibiotics reduced in average 3.5 minutes ($p < 0.001$) when physicians prescribed the treatment before registering the medical evaluation, comparing to cases that did not perform this deviation. The hospital staff considered all validated results correct with the exception of one deviation that should not have happened (blood culture was requested by nurse technician). All professionals considered it important to have access to the indicators presented in this research as they can help the hospital staff to identify problems in the execution of the CP.

Conclusion: We consider the results of this work very promising since process mining techniques can provide valuable information for the hospital to manage and improve its sepsis CP.

Keywords: Sepsis; Quality Indicator, Health Care; Critical Pathway; Clinical Pathway; Process Mining; Process Analytics

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