

Evaluation of a Tablet-Based, Rapid Documentation System - EVENTDOC™, During Real In-Hospital Medical Emergencies

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Background: Ability of an electronic information management system to perform rapid, accurate and efficient documentation is critical for real-time capture of data during high acuity medical care scenarios such as medical emergencies and emergency room procedures. In such events, when a team of care providers is busy multi-tasking various treatment steps, ability to accurately document patient status and treatment steps becomes difficult. We developed a novel tablet based electronic tool, EventDoc™, to document and manage in-hospital medical emergencies (Figure 1). In a previous study, EventDoc™ was successfully evaluated by a team of volunteer anesthesia residents using scripted mock code simulation videos¹. In this study, we describe the evaluation of EventDoc™ during real in-hospital medical emergencies (code blue).

Methods: After IRB approval 6 volunteer hospitalists and nocturnists were recruited for the study. The study volunteers were provided with a tablet on which EventDoc™ was installed. Additionally, they were also provided code-blue pagers which were activated in the event of a medical emergency. The volunteers were given a short training on using EventDoc™. As part of the study, the volunteers carried the EventDoc™ tablets and the code-blue pagers during their time at our medical center. When a medical emergency occurred, the volunteers were notified via the code-blue pager at the same time as the actual code-blue team. An available volunteer would reach the location of the event as quickly as possible and document the medical emergency using EventDoc™. The existing paper form was used as the primary mode of documentation and the official medical record while EventDoc™ was used as a secondary, yet concurrent, mode of documentation. The paper and the corresponding electronic records were retrospectively compared to assess the effectiveness of EventDoc™ in documenting medical emergencies. Specifically, data elements in both records were compared to compute data omission (partial and complete) and data timing errors.

Results: The volunteers responded to 22 code blue pages. Of these, 11 were not real emergency events. Another 2 cases involved outpatients whose paper records could not be found for comparison. Among the remaining, 9 actual medical emergency events, EventDoc™ records were compared against the paper records. Overall, EventDoc™ records contained 260 more data elements which were not documented on paper, while the paper records contained 16 more data elements undocumented in EventDoc™ ($p < 0.001$). Of the additional

data elements documented in EventDoc™, 76 were orders (medications, labs and airway), 53 were personnel arrivals and 41 were compression stop events that the paper record was not designed to capture. Even after excluding these elements, EventDoc captured 82 additional elements completely missed by paper and 8 additional elements partially missed by paper (e.g. medications without dosage). A detailed breakdown of data elements captured by both EventDoc™ and paper are shown in Figure 2. Timing errors were also less when using the EventDoc™ system with data elements recorded before paper in 26 instances. Paper records recorded data earlier than EventDoc only in 6 instances.

Conclusion: Evaluation of EventDoc™ in real medical emergencies showed that the electronic system is able to capture more data elements with better timing accuracy when compared with existing paper records. Also, features in EventDoc™ allowed capture of information (medication orders, lab orders and compression) that otherwise could not be recorded using paper records. Principles used in the design of EventDoc™ to facilitate rapid and efficient data capture can be translated to other high acuity patient care areas such as emergency rooms, operating rooms and intensive care units.

References:

¹ Grigg E, Palmer A, Grigg J, Oppenheimer P, Wu T, Roesler A, Nair B, Ross B. Randomised trial comparing the recording ability of a novel, electronic emergency documentation system with the AHA paper cardiac arrest record. *Emerg Med J.* 2014;31(10):833-9

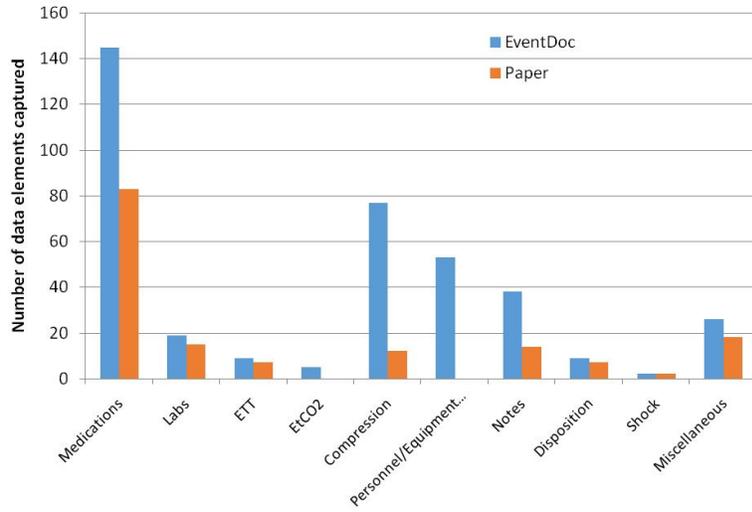


Figure 2: Categorized data elements captured by EventDoc™ and paper records