The Journal of Emergency Medicine, Vol. 55, No. 1, pp. 135–140, 2018

0736-4679/$ - see front matter

https://doi.org/10.1016/j.jemermed.2018.04.018

# Administration of Emergency Medicine

## TIME MOTION ANALYSIS: IMPACT OF SCRIBES ON PROVIDER TIME MANAGEMENT

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☐ **Abstract—Background: Scribes are unlicensed professionals trained in medical data entry. Limited data exist on the impact of scribes on provider time management in the emergency department (ED). Time-motion analysis is a tool utilized in business to capture detailed movements and durations to task completion. It offers a means to categorize how providers allocate their time during a clinical shift. Objective: Evaluate the impact of scribes on how ED providers spend their time. Methods: A prospective observational study was conducted to assess scribe impact on provider time utilization. Four research assistants (RAs) observed attending providers on 24 8-h control shifts (without a scribe), and 24 scribed shifts. RAs observed and categorized provider activity. Providers self-reported after-hours documentation times. Two-sample *t*-tests were used for normally distributed data, and Wilcoxon rank-sum tests were used for skewed data. All tests were two-sided, and *p*-values < 0.05 were considered statistically significant. Results: Scribes decreased total documentation time both on shift (mean 55.3 vs. 36.4 min, $p < 0.001$) and post shift (mean 42.5 vs. 23.3 min, $p = 0.038$). They did not significantly decrease the amount of time spent reviewing the medical records or placing orders, nor did they have an impact on provider time spent at patients' bedside or time spent discussing patient care with team members. Conclusion: The presence of scribes decreased provider documentation time but did not change the amount of time spent at the bedside or communicating with other team members. Scribes may be a potential strategy to decrease the clerical burden.** © **2018 Elsevier Inc. All rights reserved.**

☐ **Keywords—scribes; clerical burden; provider burnout; electronic medical records**

## INTRODUCTION

Clerical burden, including electronic health record (EHR) documentation, reviewing past medical records, and ordering tests and medications, has become a significant burden on emergency department (ED) providers (1). Tasks using a computer interface can take up more than half of a physician's time per shift (2). EHRs serve a promising role in health care quality and safety; however, multiple recent publications outline the limitations and difficulties associated with them, including their innate inefficiencies, time-consuming nature, and disruptiveness when used in the patient encounter (3–5). Further, literature suggests that physicians have shifted their focus from face-to-face patient care to face-to-screen, with an estimated 43% of a physician's time spent on data entry, compared with 28% on direct patient care (6).

Scribes, nonlicensed health care team members that document the patient history and examination contemporaneously with the clinical encounter, offer a potential solution to the clerical burdens and time constraints felt by ED providers. There is no clear definition of the scope of practice of scribes, and duties vary amongst clinical sites. Scribes keep track of laboratory and radiological findings

Received: 6 January 2018; Final submission received: 16 March 2018;
Accepted: 10 April 2018

and record pertinent documentation to improve physician productivity and patient care (3). They do not act independently, but rather function under the supervision of a physician to assist with documentation, retrieval of test results, and support workflow (7).

Several editorials propose the use of scribes as an operational improvement tactic for providers in a variety of health care settings (8–11). However, rigorous peer-reviewed literature is limited (12–20). Furthermore, peer-review studies looking at the use of scribes in an ED are even more limited (14–20). A recent meta-analysis highlighted the difficulty in determining how and when scribes are beneficial to EDs (21).

The impact of scribes must be critically examined to inform health administrators and physicians considering employing scribes. Additional research in task substitution and workflow efficiency may aid hospital administrators and medical practitioners seeking to enhance daily work productivity. A study method known as "time motion analysis" (TMA) can be applied to identify how scribes affect practitioners' workflow. TMA is a method that systematically breaks down a clinical shift into individual functional components through direct and continuous observation. Thus, a practitioner's work shift is categorized into time units that are then assigned to routine clinical tasks usually encountered during the shift. Although this methodology has been described once before in relation to scribes in the clinic setting, we are the first to apply TMA to ED scribes (13). Using TMA, we evaluated and compared how ED practitioners spent their time on a shift, with and without a scribe on their team.

## METHODS

### *Study Design and Setting*

This study was conducted at an academic ED that hosts an Emergency Medicine residency training program. Our ED includes several distinct treatment areas, or pods, one of which is dedicated to pediatric patients. We manage 75,000 patient visits annually, 82% of whom are adults (age > 17 years). On average, 35% of adult patients and 13% of pediatric patients are admitted.

To standardize this study, we limited our evaluation to a single area of the ED. This area manages adult patients with Emergency Severity Index levels of 2 through 5, and is staffed by an attending provider and a nurse practitioner or a physician assistant every Tuesday–Friday. These shifts are predictably busy, comprise similar patient populations, and provide similar provider experiences. Staffing Saturday, Sunday, and Monday varies, and therefore these days were excluded a priori. Triage nurses assign patients to areas and rooms on an acuity-based, first-come-first-served basis, and providers have no input on which patients are assigned to their area. To minimize bias, the study's three physician investigators did not work in this area during the study period. Our study utilized a prospective cohort design.

The study was deemed exempt by our Institutional Review Board.

### *Selection of Participants*

ED attending physicians and ED scribes were observed from January 31, 2017 to April 21, 2017. Scribe staffing followed an allocation pattern developed independently from the providers' schedule, with no preference given to specific providers or scribes. The pattern ensured balance between the scribe (intervention) and nonscribe (control) groups in times and days of the week, with an equal number of scribe days and nonscribe days in this study.

### *Intervention*

Scribes were recruited and trained through an in-house program with a defined curriculum developed by a physician with prior experience implementing scribe programs (22). The scribes were largely prehealth students hired as temporary employees for expected 1- to 2-year periods. Each scribe provided 1-to-1 support to an attending physician for the entirety of the physician's shift. Scribe experience ranged from 6 months to 2 years. Scribes in our institution accompany physicians into the patient room during the initial encounter to document the history of present illness; review of systems; past medical, social, and surgical history; and physical examination. After the initial evaluation, they prompt the provider for a dictated medical decision-making section. Throughout the patient's ED stay, scribes document re-evaluations of the patient, pertinent laboratory and radiology findings, and disposition discussions with discharge instructions as appropriate.

### *Methods and Measurements*

Four research assistants (RAs) were hired to observe and record activities throughout an entire shift. Prior to initiation of the study, the RAs participated in observation shifts with the Principal Investigator to practice using the data collection tool and to assure reliability in data categorization and collection.

A tablet-based time recorder was used for real-time capture of all activities during the teams' 8-h shift. If the provider was still at work when the RA's 8-h shift was complete, additional after-shift documentation time