

Impact of Medical Scribes on Emergency Physician Diagnostic Testing and Diagnosis Charting

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Introduction

- Medical scribes are becoming increasingly utilized in emergency departments (EDs) by emergency physicians (EPs)¹.
- Scribes' beneficial impact on productivity metrics including patients seen per hour² and ED length-of-stay³ is well-documented.
- A knowledge gap exists with regards to how scribes might impact the EP diagnostic process, which impacts patient safety⁴.
- Our goal was to identify what effects, if any, medical scribes have on the way EPs order diagnostic tests and how they document their diagnostic decision making.
- We hypothesized that EPs working with scribes would order more diagnostic tests and would document broader differential diagnoses.

Aims and Objectives

- We aimed to improve our understanding of how medical scribes might impact the diagnostic process of EPs.
- The primary objective of this study was to determine if there is any difference in EP laboratory study or radiologic study ordering when scribes are used compared to when scribes are not used.
- Additionally, we had a secondary objective of investigating whether there is a difference in diagnostic documentation by EPs when scribes are used.
- These aims and objectives were achieved via a retrospective chart review.

Methods

- **Design:** retrospective cohort study utilizing a chart review design
- **Setting:** Beaumont Troy ED and Beaumont Royal Oak ED. Troy utilizes scribes on all shifts, while Royal Oak utilizes scribes on some overnight shifts and otherwise has no scribe availability.
- **EP Population:** Three EPs work at both EDs and thus work regularly in both scribe and non-scribe settings.
- **Timeline:** January 1, 2018 to December 31, 2018.
- **Sample Size:** 200 charts
- **Inclusion criteria:** adult patients (18 years old) with ED chief complaints of "headache," "chest pain," "abdominal pain," "fever," "fatigue," or "weakness," patients seen only by an attending physician without cosigners (e.g. residents, mid-level providers) and who received a final disposition of "admitted"
- **Exclusion criteria:** pediatrics, pregnancy, trauma victims, presentations relating to recent surgery, and chief complaints involving alcohol, illicit drug use, or toxicologic exposure
- **Randomization:** We eligible charts and organized them by ED location and physician ID. We randomized these subsets using SAS/STAT software (Version 9.4 of the SAS System for Windows).
- **Outcome Measures:** number of laboratory tests ordered per encounter, number of radiologic studies ordered per encounter, whether or not a differential diagnosis was documented in the chart, the length and number of diagnoses considered.

Results

Sample Characteristics and Demographics

- 198 charts randomly selected for analysis of 607 eligible charts.
- 114 (58%) charts from Troy, 84 (42%) from Royal Oak. This resulted in a sample of 126 (64%) charts generated by a scribe and 72 (36%) generated by an EP.
- Ratio of charts authored by each of the three EPs was approximately equal (69:66:63)
- Median patient age was 68 (IQR 59–81) years old
- Male-female ratio of patients was approximately equal (48% male, 52% female)

Effect on Lab/Radiology Study Ordering

- Mean number of laboratory studies ordered per encounter was 6.69 (SD = 3.90)
- **Non-significant difference** between scribe group and non-scribe group: 1.04 fewer tests ordered (6.31 vs. 7.35, mean difference 95% CI -2.34 to 0.26)
- Mean number of radiologic studies ordered per encounter was 1.45 (SD = 0.92), with **no difference** in tests ordered between the scribe group and EP-only group (1.49 vs. 1.39, mean difference 95% CI -0.15 to 0.35) (Table 1)

Effect on Differential Diagnosis Documentation

- Documented in 67 (33.8%) charts
- Each differential diagnosis considered a mean of 2.31 (SD = 1.05) diagnoses and averaged 64.63 (SD = 37.30) words.
- Scribes **did not impact** the frequency of differential documentation or the number of diagnoses considered.
- Charts completed by a scribe did have **significantly higher word counts** than those completed by an EP alone, a difference of 22.79 words (95% CI 6.77-38.81) (Table 1).

Table 1. Results. Characteristics of charts completed by scribes vs. EPs.

Variable	Scribe (n=126)*	EP (n=72)*	Scribe minus EP, mean difference, 95% CI
Number of laboratory studies ordered: mean, SD	6.31, 2.99	7.35, 5.08	-1.04, -2.34 to 0.26
Number of radiologic studies ordered: mean, SD	1.49, 0.99	1.39, 0.76	0.10, -0.15 to 0.35
Documented differential diagnosis: n, %	43, 34%	24, 33%	0.01, -0.13 to 0.14
Number of diagnoses considered in differential diagnosis: mean, SD	2.40, 0.93	2.17, 1.24	0.23, -0.36 to 0.82
Word count of differential diagnosis: mean, SD	72.79, 40.71	50.00, 24.87	22.79, 6.77 to 38.81

*Data regarding differential diagnosis documentation uses n=43 for scribes and n=24 for EPs.

EP=Emergency Physician; SD=Standard Deviation; CI=Confidence Interval

Conclusions

- Scribes are being utilized for documentation alone and do not appear to alter EP diagnostic testing, i.e. they serve as a tool for provider efficiency/productivity without altering the diagnostic process.
- This is perhaps because standardized documentation and macros (which have been shown elsewhere to be beneficial⁵) might be sufficient, leading to increases in speed alone⁶.
- Given the changing role of the scribe,⁷ they might be an untapped resource to assist in the diagnostic process.
- Future research options: scribes and diagnostic accuracy, scribes using automated differential diagnosis generators,⁸ directly comparing scribe impact on throughput parameters and documentation practices.
- Limitations: small sample size, limited variation due to macros, limited investigator blinding, only studied patients who were admitted with certain chief complaints
- **In summary, our findings suggest that scribes do not alter EP diagnostic test ordering and have minimal impact on how EPs document their diagnostic process. Further research can help explore a potential role for scribes to improve diagnosis in the ED.**

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