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Scribes Impact On Patient And Provider Experience In The Outpatient Setting

Kimberly A. Taylor
University of South Carolina

SCRIBES IMPACT ON PATIENT AND PROVIDER EXPERIENCE IN THE OUTPATIENT SETTING

by

Kimberly A. Taylor

Bachelor of Science in Nursing
Medical University of South Carolina, 1994

Master of Science in Nursing
East Carolina University, 2008

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Accepted by:

Deb McQuilkin, Major Professor

Ronda Hughes, Committee Member

Nausheen Momen, Committee Member

Cheryl L. Addy, Vice Provost and Dean of the Graduate School

DEDICATION

I am extremely grateful to God for giving me the strength, ability, and desire to pursue this milestone accomplishment. Through Him I have been blessed with amazing family, friends, and professors who have encouraged, and motivated me to stay the course, and finish with excellence. I would like to specifically thank my husband, children, parents, and nephew for their love, and support throughout every season of this journey. This degree is for you guys too! Truly you are the greatest blessings in my life, and I love you all dearly!

I am very proud to be a Gamecock and am thankful for the many phenomenal mentors that I had the honor to work with over the course of my time at the University of South Carolina. The College of Nursing faculty is a dynamic group of leaders and I appreciate the goodness they sowed into my life.

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With a relocation from the East Coast to Texas in the middle of my degree program, Dr. Halasz worked diligently to ensure that I met every requirement of the degree plan to facilitate a Fall 2017 graduation. Additionally, I am honored to have been selected as the University of South Carolina's College of Nursing's 2016-2018 Jonas Veteran Healthcare scholar. I thank all of my mentors and Dean Jeannette Andrews for their support during the application process.

I would like to express a deep sense of gratitude to Dr. Rick Hammett and Mr. Mario Ernie Corral for their assistance with statistical analysis. I would not have been able to perform these tasks without them. Last but definitely not least, I would like to thank all of my peers and colleagues that I had the pleasure to work, and learn with throughout my academic trajectory. Truly, they made it a memorable journey. I wish everyone continued success in all of their future endeavors.

ABSTRACT

The purpose of this project was to evaluate the effectiveness of using scribes in the outpatient setting on patient and provider experience. A mixed methods approach with a convenience sample of voluntary patient participants scheduled for an outpatient appointment was utilized. Two primary care physicians volunteered to receive scribes. Four hospital corpsmen were selected and trained to serve in the scribe role.

This quality improvement project evaluated two aspects of experience during the implementation of the scribes. These included: 1) patient experience as indicated via a pre and post implementation questionnaire; and 2) provider experience as indicated via a pre and post implementation questionnaire.

SPSS was used to analyze quantitative data. Results revealed a slight decrease of 0.18 mean patient satisfaction and overall patient experience. The providers' experience improved with an average 50% decrease in time spent after hours documenting in the electronic health record, enhanced engagement with patients, and improved work life balance. Clinic efficiencies improved with a savings of 13.88 minutes per appointment, and enhanced clinical and war time readiness for hospital corpsmen were identified.

Although a small-scale project, the provider experience was strengthened when using scribes while patient experience decreased slightly. Future exploration, centered on the patient and provider experience could be beneficial to organizations. The consideration of scribes could foster work life balance, retention, and wellness in this

setting for providers. Further study of the scribe's experience, especially considering the positive comments from the hospital corpsmen that participated as scribes during the project, could provide beneficial outcomes.

Keywords: Scribe, patient experience, provider experience, electronic health record (EHR), and outpatient

PREFACE

In the fast-paced environment of healthcare, it is imperative to consider new and innovative evidence-based strategies to promote positive outcomes and experiences for patients and providers. The utilization of scribes is recommended as a consideration and strategy to elevate overall care experience; therefore, this evidence-based quality improvement project was designed to evaluate the impact scribes could have on patient and provider experience in an outpatient setting. Furthermore, as a requirement of the Doctor of Nursing Practice program, this evidence-based practice project was completed as partial fulfillment of the program.

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INTRODUCTION

Introduction and Background

A strong provider-patient relationship is critical to promote collaboration, partnerships, and ultimately optimal patient outcomes (Zolnierek & DiMatteo, 2009). With the ongoing transition to electronic health records (EHR), providers have additional administrative burdens to perform data entry while engaging with the patient during the health care visit (Carnes, de Riese, & de Riese, 2015). The complex nature of the EHRs left providers frustrated and distracted which hindered connectivity, and communication with the patient (Shachak & Reis, 2009). The utilization of medical scribes in the outpatient clinical setting was a strategy shown to enhance provider and patient interaction, decrease clinician's administrative tasks, and promote satisfaction among providers and patients (Allen, Banapoor, Weeks, & Payton, 2014; Hess et al., 2015).

Challenges such as these are prevalent within Navy Medicine (J. Ehrmann, personal communication, January 18, 2017). In the quest to provide high quality care and promote high reliability, the Surgeon General has given direction to advance patient experience, cultivate partnerships, and promote health for the Navy Medicine team and their beneficiaries (Wise, 2016). To this end, a quality improvement pilot project was

implemented on a small scale within the Family Medicine clinic to determine benefits of scribes.

Scope of the Clinical Problem

Menon (2015) stated there was a general perception that EHRs impeded effective communication with patients, and providers thought they spent more time doing administrative duties "like documentation and writing orders, and less time interacting with patients" (p. 58). Providers believed that EHRs created a barrier that decreased and often removed the personal interaction and human connectivity during a patient visit (Bank et al., 2013; Hess et al., 2015). Likewise, Kreamer, Rosen, Susie-Lattner, and Baker (2015) acknowledged that providers affirmed they experienced challenges with communication when there were constant distractions focused on data entry into the EHR. This concern transcended into all potential health care touch points for a patient seeking medical treatment from a clinical provider (Kreamer, Rosen, Susie-Lattner & Baker, 2015).

Within the Navy Medicine Family Practice outpatient clinic, providers have been challenged with documenting while interacting with the patient, waiting to document after the patient encounter, or a combination of both (M. Buchanan, personal communication, November 13, 2016). These choices led to provider frustration, increased time required to document, delays in completing the notes, and decreased personal interaction with the patient (J. Ehrmann, personal communication, January 18, 2017).

Significance

With the adoption of the EHR, Koshy, Feustel, Hong, and Kogan (2010) noted that providers believed "that the use of the EHR threatens their relationship with the patient because attending to a computer interferes with the doctor-patient interaction, and/or they believe that typing in front of the patients is rude" (p. 259). Likewise, Bank and colleagues (2013) indicated that, when an EHR was utilized, the personal interaction with patients was hindered, not patient centered, and fragmented. As a result, medical scribes were utilized with increased prevalence to improve productivity, efficiency, and patient and provider experience (Kosowsky, 2015).

While the research on the benefits of scribes in the practice setting is increasing, literature indicated that in a variety of settings, such as the emergency department, specialty clinics, and outpatient arena, positive outcomes occurred for patients and providers (Arya, Salovich, Ohman-Strickland, & Merlin, 2010; Bank et al., 2013; Bastani, Shaqiri, Palomba, Bananno, & Anderson, 2013; Cabilan & Eley, 2015; Imdieke & Martel, 2017; Koshy et al., 2010; Menon, 2015; Shultz & Holmstrom, 2015; Walker, Ben-Meir, O'Mullane, Phillips, & Staples, 2014; Yan et al., 2016). A study conducted by Bank and Gage (2015) revealed that during an outpatient health care visit providers using scribes saved approximately 2.5 hours during each scheduled clinic day. Bank and Gage added that providers were able to spend more time directly engaging with patients resulting in "increased face-to-face interaction with patients during a clinic visit without distraction from interaction with a computer" (p. 494).

Additionally, Bastani and colleagues (2013) discovered that the implementation of a scribe program positively impacted patient satisfaction and improved overall patient satisfaction scores by 14%. The use of scribes also improved provider efficiencies allowing the provider to arrive on time to see the patient thus enhancing the patient care experience and improving patient satisfaction (Bank & Gage, 2015). Furthermore, Bank and colleagues (2013) noted that "time spent in direct patient interaction (without using the computer) was over fourfold greater on scribe visits. Overall quality of the physician-patient interaction was also significantly better on scribe…visits" (p. 402). These recent studies and literature conveyed the importance of considering utilization of scribes which proved to alleviate the administrative burden and tasking of providers in order for them to focus on the patient during the health care visit, strengthen the provider-patient relationship, and improve patient and provider experience.

Background: Analysis and Synthesis

Utilizing components of the PICOT question and key words of scribe, patient satisfaction, and provider satisfaction, the search strategy yielded 17 applicable articles for consideration and evaluation of the PICOT question. Of those, thirteen articles described research studies and one resource was a randomized study. All of these articles explored the intervention of the scribes in an ambulatory setting. Five research studies included financial and clinical improvements.

One systematic review utilizing an expert consensus panel explored the impact of scribes within an emergency department, cardiology clinic, and urology clinic. Three literature reviews evaluated documentation burden, wait times, and patient and provider

experience. All of the relevant articles were published between July 2009 to January 2017 revealing that the utilization of medical scribes was a relatively new strategy since the inception of the EHR.

The Koshy, Feustel, Hong, and Kogan (2015) randomized control study found that scribes were readily accepted by the patients and providers. A total of 166 scribe-patient satisfaction surveys, and 321 control patient satisfaction surveys were collected. A total of 29 scribe-physician satisfaction surveys and 26 control physician surveys were obtained. Patient satisfaction rates increased from 87% to 93%, and physicians were dramatically more satisfied with their experience showing a 50% improvement from 19% to 69%. Likewise, the Imdieke and Martel (2017) quasi-experimental study revealed that utilizing scribes in the ambulatory care setting decreased provider time spent documenting by over 50%, and improved satisfaction of the providers.

In the Bastani, Shaqiri, Palomba, Bananno, and Anderson (2014) quasi-experimental study, initial data revealed that collectively providers on shift during a 24-hour period spent 25 hours a day in front of a computer instead of with patients. Comparative data was collected on over 11,000 encounters prior to the implementation of scribes, and over 12,000 encounters after scribe implementation. With the implementation of scribes, the satisfaction increased for patients from 58% to 72%, and for providers from 62% to 86%. The Bank and Gage (2015) retrospective study found that revenue increased over a million dollars, and providers gained more than two hours a day back to spend interacting and engaging with patients, were collectively able to see almost 10 additional patients per hour, and were able to complete all of their documentation with their scheduled time frame.

The Carnes, de Riese & de Riese (2015) study focused on waiting times for patients, and time spent with provider. Results indicated that the urology clinic would benefit from the implementation of a scribe program as long as it was a cost effective and financially sound initiative. Walker, Ben-Meir, O'Mullane, Phillips, and Staples (2014) utilized comparison data from six and a half months prior to the scribe program and then for six weeks after the scribe program to reveal a 36% reduction in patient wait times to see the provider, and an increase of 0.32 patients per hour. Hess and colleagues (2015) noted that after scribe implementation over 61% of providers valued scribes, 82% of the providers indicated that charting and documentation were enhanced, and 30% ($p<.01$) more time was spent with the patient. Allen, Banapoor, Weeks, and Payton (2014) found a statistically significant decrease in waiting time to triage, transition time to room, and disposition with a p value of less than 0.001 with a scribe program. Furthermore, 100% of the providers indicated scribes were a valuable asset and indicated a significant improvement in quality of life, workplace satisfaction, and stress levels.

Arya, Salovich, Ohman-Strickland, and Merlin (2015) focused on relative value units (RVU), and number of patients seen per hour. This study indicated that scribes allowed an additional patient to be seen each hour which increased RVUs to 2.4/hour. Bank and colleagues (2013) conducted a study with four physicians who saw 129 patients before scribes and then 210 patients after scribe. Results showed a 59% ($p < .001$) increase in patients per hour and a 57% increase in RVUs per hour yielding direct and indirect financial gains of over $200,000. Kreamer, Rosen, Susie-Lattner and Baker (2015) revealed that the scribe program reduced charting for practitioners by 10 minutes

per patient. This reduction allowed providers to interact and communicate more with patients and further elevated patient satisfaction.

These studies (Allen, Banapoor, Weeks, & Payton, 2014; Arya, Salovich, Ohman-Strickland, & Merlin, 2010; Bank & Gage, 2015; Bank et al., 2013; Bastani, Shaqiri, Palomba, Bananno, & Anderson, 2014; Carnes, de Reise, & de Reise, 2015; Hess et al., 2015; Imdieke & Martel, 2017; Koshy, Feustel, Hong, & Kogan, 2010; Kreamer, Rosen, Susie-Lattner, & Baker, 2015; Walker, Ben-Meir, O'Mullane, Phillips, & Staples, 2014) revealed that scribes had a positive impact on patient and provider experience. Likewise, the utilization of scribes also produced financial, clinical, and productivity improvements which led to overall efficiency and quality for patients, providers, and organizations. The cultivation of these types of positive environments and outcomes were beneficial for both the patients and providers.

As the various levels of evidence were examined, the Schultz and Holmstrom (2015) systematic review explored five studies assessing use of scribes in emergency departments, and cardiology and urology clinics. The authors indicated that two of the three studies showed no change in patient satisfaction, two of the studies revealed improved provider satisfaction, three of the studies noted improved time related efficiencies, and one study reported improved patient-provider interactions. Additionally, Yan and colleagues (2016) conducted a qualitative study which identified that patients were comfortable with scribes being in the room, found that providers were able to listen more attentively, and gave their full attention to the patient further enhancing the patient and provider experience.

Within the literature reviews, Cabilan and Eley (2015) identified that scribes alleviated documentation burden, increased number of patients seen, and improved patient wait times. Shachak and Reis (2009) identified that innovative strategies such as scribes were beneficial in strengthening communication between the provider and patient as well as patient outcomes. Kosowsky (2015) indicated that physicians were better able to engage and communicate with patients without the distraction of a computer when a scribe was utilized during the patient visit. Menon (2015) referenced that using scribes allowed the provider to interact more freely with the patient.

These articles (Cabilan & Eley, 2015; Kosowsky, 2015; Menon, 2015; Shachak & Reis, 2009; Shultz & Holmstrom, 2015; Yan et al., 2016) further supported that scribes removed the administrative burdens on the providers, improved patient wait times, enhanced communication between the provider and the patient, promoted positive outcomes, and positively impacted patient and provider experience. To this end, the value of scribes and their ability to enhance the healthcare experience for patients and the quality of life for providers must be considered.

Evidence-based practice considers "a synthesis of evidence from multiple studies and combines it with the expertise of the practitioner as well as patient preferences and values" (Melnyk & Fineout-Overholt, 2015, p. 4). In the fast-paced environment of healthcare, it is imperative to consider new and innovative strategies to promote positive outcomes and experiences for patients and providers. The utilization of scribes is recommended as a consideration and strategy to elevate the overall care experience for patients and the experience for providers.

Limitations regarding the utilization of scribes is hinged on the premise that there is a limited number of studies on this particular strategic initiative and sample sizes were relatively small. To this end, there is a critical need for randomized control and other types of experimental studies with larger sample sizes to be designed and conducted to assess the impact of scribes on the provider and patient experience. High levels of evidence and quality studies are highly recommended in order to grow this body of knowledge and further strengthen the evidence-based practice of scribe utilization in the outpatient setting.

Although there is a limited amount of evidence to support the impact of scribes, the literature that is available clearly delineates the benefits scribes can have on enhancing the provider and patient experience. Furthermore, the evidence reveals that additional benefits to the organization and community at large can be extrapolated from using scribes to include improved efficiencies, increased revenue, decreased wait times, enhanced access to care, enriched quality of life, and optimized patient outcomes.

Organizations are encouraged to evaluate their current practices, satisfaction scores, and financial standings to determine if scribes could be utilized to strengthen provider and patient experience. Considerations should be made to the organization's receptivity to innovative strategies and time must be devoted to cultivate adequate buy in from the stakeholders in order to maximize the potential benefits of this type of intervention. Furthermore, the strengths of this cutting-edge initiative are outlined within the body of this document, and this highlights the positive impact that scribes can have not only on the provider and patient experience, but also on organizational and financial results.

Statement of Purpose

The purpose of this study was to evaluate the effectiveness of using medical scribes in an outpatient clinical setting on provider and patient experience. Menon (2015) remarked that "medical scribes are trained nonmedical personnel, who work closely with their partnered clinician either a physician, physician assistant, or advanced practice nurse practitioner" (p.58), and scribes were able to "perform multiple documentation tasks under physician supervision to assist physicians during their care of patients" (Banks & Gage, 2015, pp. 489-490). Shultz and Holmstrom (2014) indicated that as EHRs "continue to be integrated within health care settings both large and small, policy makers, health care administrators, and clinicians will need new tools to improve productivity, quality, and outcomes" (p.379). Furthermore, Shultz and Holmstrom noted that "medical scribes may improve clinician satisfaction, productivity, time-related efficiencies, revenue, and patient-clinician interaction" (p.379).

At the proposed site where this project occurred, the providers identified that they were inundated with computer documentation, spent several additional hours after work documenting in the medical record, and expressed dissatisfaction with the current practice (J. Ehrmann, personal communication, November 13, 2016). While patient satisfaction was relatively stable at the location, there were patients who expressed the need to enhance patient and provider interaction, and overall experience of care (M. Buchanan, personal communication, December 21, 2016). In reviewing these elements with the executive leadership, we surmised that the pilot project of utilizing scribes in the outpatient setting was a valuable initiative and in alignment with the Surgeon General's

priority of enhancing the patient experience (M. Buchanan, personal communication, January 15, 2017).

PICOT Question

The PICOT question asked in this project was as follows:

In adult patients (P), does having a medical scribe (I) versus not having a medical scribe (C) improve the patient and provider experience (O) during a scheduled outpatient visit (T)?

PICOT Definitions

The PICOT definitions for this project are included below:

Population (P) = adult patients at the Naval Health Clinic Corpus Christi, Texas

Intervention (I) = having a medical scribe

Comparison (C) = not having a medical scribe

Outcome (O) = improve patient and provider experience; patient experience evaluated based on enhanced communication and interaction with provider, and overall experience; provider experience evaluated based on improved efficiency, decreased administrative burden, enhanced interaction with patient, and provider satisfaction.

Time (T) = scheduled outpatient visit

Project Methodology

Theoretical Framework

The theoretical framework selected for this evidence-based project was developed by Rosswurm and Larrabee and is called the Model for Evidence-Based Practice Change. This model incorporates six steps to include step one) assess the need for change in practice, step two) locate the best evidence, step three) critically analyze the evidence, step four) design practice change, step five) implement and evaluate change in practice, and step six) integrate and maintain change in practice (Melnyk & Fineout-Overholt, 2015). Within step one, the providers, ambulatory care nurse manager and clinic manager for family practice, director of outpatient services, executive officer, director of quality improvement and chief nursing officer were the stakeholders identified.

Then, the staff and project author gathered, consolidated, and evaluated data on patient and provider experience to formulate the PICOT question referenced above. The focus of this project was to determine the impact that scribe utilization had on the patient and provider experience. The independent variable for this project was the scribe utilization and the dependent variables were the patient experience and provider experience.

Next, step two focused on locating the best available evidence. The search yielded 17 references and each piece of literature was reviewed for inclusion criteria in congruence with the PICOT question. Then, the John Hopkins Nursing Evidence-Based Practice: Models and Guidelines (Dearholt & Dang, 2012) was utilized to evaluate and

study each article to identify the level of evidence, and quality ratings. The references identified consisted of Level I, Quality B to Level 5, Quality C.

Within step three, evidence was synthesized, feasibility was addressed, and potential benefits and risks were considered. The stakeholders, staff, and project author identified that the family practice team was willing to participate in a quality improvement pilot project, equipment was available to support project, and leadership was supportive. Furthermore, the review of available literature supported the benefits of an innovative practice change, and the stakeholders were convinced there was an opportunity to improve current practices in the family medicine clinic. Within step four, the Rosswurm and Larrabee Model guided a change in practice design. This new practice design involved a medical scribe accompanying the provider in the outpatient health care settings during designated patient visits. In order for the maximum positive impact on patient and provider experience, it was critical to ensure that the stakeholders remain engaged and were supportive of the practice change. The family practice clinic managers and project author collaborated to ensure promotion of new practice design. Providers and scribes participated in a weekly debrief and feedback session to address concerns and questions that emerged during the week.

For step five, the pilot study within the outpatient setting was launched. During this time, evaluation of the "process, outcomes, and costs; and development of conclusions and recommendations" (Melnyk & Fineout-Overholt, 2015, p. 289) occurred. Lastly, step six included recommendations for practice, consideration of this evidence-based practice change throughout the family practice clinic, and ongoing monitoring and feedback to the stakeholders.

Project Intervention

This project was performed at a Military Treatment Facility (MTF) in the Family Practice outpatient setting during scheduled routine outpatient visits to improve the patient and provider experience. A mixed methods approach with a convenience sample of voluntary patient participants scheduled for an outpatient appointment were utilized. Two primary care physicians, a Family Practice doctor and an Internal Medicine doctor, were selected as the providers to receive scribes and were willing to participate in this pilot project. Four hospital corpsmen were selected as scribes, and were willing to participate in the project.

These four hospital corpsmen served as scribes after they received two weeks of training centered on orientation to the EHR, data entry into the EHR, creation of referrals, and scribe simulation in which the scribe was paired with their designated provider in a training atmosphere with opportunities to perform scribe functions with a simulated patient. Laptops were provided to the scribes during the project period and utilized during the patient visit. No additional resources were needed for the project.

Navy Medicine and the University of South Carolina Institutional Review Boards (IRB) considered this project exempt. Physicians, and hospital corpsmen identified to participate were approved by their respective chain of command within the Navy, and were not pending any deployment or transfer orders. The questionnaires utilized in this pilot project were developed in compliance with Navy Medicine guidelines and approved for use.

Action

Two scribes were paired with the same physician throughout the project period, and accompanied the provider during the patient visit to perform real-time documentation into the EHR. Patients provided verbal consent at the beginning of the appointment. During sensitive physical exams, scribes were excused from the room.

Evaluation Plan

Prior to the launch of the scribes, patients willing to participate were surveyed via a printed questionnaire for one week. Of the initial 100 surveys given to patients, 89 were returned to check-out personnel. Patients that agreed to participate were also surveyed via a printed questionnaire during the final week (week six) of the pilot project with 96 questionnaires collected. Patients returned completed surveys to check-out personnel. For providers, printed questionnaires were disseminated and collected prior to the implementation of the pilot project and then three days after completion of the project.

After collection of questionnaires from the patients and providers, a review and comparison was performed with the assistance of the committee. Descriptive statistics, improvements, and comments were assessed and integrated into the results section of this project.

Expanded project intervention

The original project was scheduled to occur over a six-week period. After completion of this phase of the project, the project was expanded an additional six weeks to evaluate the check in and check out times for patients, and note closures, within the 72

hour time frame designated by Navy Medicine, of the providers. This additional phase provided an opportunity to analyze the efficiencies gained by providers when utilizing scribes and was thought to be a beneficial addition in order to further support the value of this innovative quality improvement project.

Timeline

The first phase of the pilot project was initiated during the first quarter of the year. The second phase immediately followed, and both phases were completed over a 12-week period.

Evaluation

The ambulatory clinic was implementing several quality improvement projects during the previous months, and the current climate was conducive for a project of this nature. Leadership was highly supportive and interested in this type of quality improvement initiative. Given this environment, and utilizing the principles of Kotter (2017), change management was guided for long term sustainability. The use of scribes is an interest in Navy Medicine, and this project may facilitate understanding of the impact scribes can bring to an organization prior to utilizing in other outpatient settings to enhance patient and organizational outcomes.

Introduction to Article for Submission

The manuscript will be submitted to the Military Medicine journal. In order to satisfy the requirements of this journal, manuscript guidelines include utilizing the Standards for Quality Improvement Reporting Excellence (SQUIRE) guidelines, and that

manuscripts for pilot projects could not exceed 3,000 words. Additionally, the abstract was required to be between 250 to 500 words.

Upon approval from the Doctor of Nursing Practice committee, the manuscript and abstract must also be approved by Naval Health Clinic Corpus Christi's Public Affairs Officer, and the Navy Medicine East's Public Affairs Officer prior to submission to the Military Medicine journal.

CHAPTER 2

MANUSCRIPT

SCRIBES IMPACT ON PATIENT AND PROVIDER EXPERIENCE IN THE OUTPATIENT SETTING

[1]CAPT Kimberly A. Taylor, NC USN, Deb McQuilkin, DNP, Ronda G. Hughes, PhD.

To be submitted to *Military Medicine*

ABSTRACT

Introduction

A strong patient-provider relationship is critical to promote collaboration, partnerships, and ultimately optimal outcomes. The usage of electronic health records (EHR) has created additional administrative burdens on providers to perform data entry while trying to engage with the patient during the health care visit (Carnes, de Riese & de Riese, 2015). The complex nature of the EHR left providers frustrated and distracted which hindered connectivity, and communication with the patient (Shachak & Reis, 2009). The utilization of medical scribes in the outpatient clinical setting was a strategy shown to enhance patient and provider interaction, decrease clinician's administrative tasks, and promote satisfaction among providers and patients (Allen, Banapoor, Weeks, & Payton; Hess et al., 2015). This was an innovative quality improvement pilot project to improve the patient and provider experience using scribes in an outpatient setting.

Materials and Methods

Two providers and four hospital corpsmen were selected to participate in this pilot project. The four hospital corpsmen received a two-week training of the fundamentals of the EHR and their role as scribes prior to the start of the project. Two corpsmen were designated for each provider and worked with their provider throughout the six-week project period. The two primary aspects evaluated during the implementation of the scribes were the patient experience, and provider experience. Additional findings of improved clinic efficiency, completion of documentation, and positive qualitative comments from the scribes' experience were also identified as a result of this project.

Results

The experience questionnaire results indicated a slight mean decrease of 0.18 mean in patient satisfaction and overall patient experience. However, the Navy Medicine patient satisfaction, obtained through the Interactive Customer Evaluation, and the Joint Outpatient Experience Survey, indicated that there was no decrease in patient satisfaction or overall experience during the project period. The providers' experience improved with an average 50% decrease in time spent after hours documenting in the EHR, enhanced engagement with patient, staff, and ancillary team members, and improved work life balance. Additional findings of improved clinic efficiencies with saving 13.88 minutes per appointment and completion of notes for both providers were identified.

Conclusion

The delivery of health care is a multifaceted team approach in a fast-paced environment of evolving EHRs. The patient and provider experience was strengthened through the utilization of medical scribes, so future research centered on the provider and patient experience could be beneficial to organizations. In multiple settings, documentation requirements burden providers. The consideration of scribes could foster work life balance, retention, and wellness. Further study of the scribe's experience, especially considering the positive comments from the hospital corpsmen that participated as scribes during the project, could provide beneficial outcomes. Navy Medicine is advancing every opportunity to strengthen clinical and operational readiness, health and partnerships to provide the highest quality care and promote wellness for our patients. This initiative could facilitate the attainment of this objective.

Keywords: patient experience, provider experience, scribe, outpatient, and electronic health record (EHR)

Introduction

A strong provider-patient relationship is critical to promote collaboration, partnerships, and ultimately optimal patient outcomes (Zolnierek & DiMatteo, 2009). With the ongoing transition to electronic health records (EHR), providers have additional administrative burdens to perform data entry while engaging with the patient during the health care visit (Carnes, de Riese, & de Riese, 2015). The complex nature of the EHRs has left providers frustrated and distracted, which has hindered connectivity to, and communication with the patient (Shachak & Reis, 2009). The utilization of medical scribes in the outpatient clinical setting was used as a strategy shown to enhance provider and patient interaction, decrease clinician's administrative tasks, and promote satisfaction among patients and providers (Allen, Banapoor, Weeks, & Payton, 2014; Hess et al., 2015).

With the adoption of the EHR, Koshy, Feustel, Hong, and Kogan (2010) noted that providers believed "that the use of the EHR threatens their relationship with the patient because attending to a computer interferes with the doctor-patient interaction, and/or they believe that typing in front of the patients is rude" (p. 259). Likewise, Bank and colleagues (2013) indicated that, when an EHR was utilized, the personal interaction with patients was hindered, not patient centered, and fragmented. To improve the patient-provider interaction, medical scribes were utilized with increased prevalence to improve productivity, efficiency, and patient and provider experience (Kosowsky, 2015).

The research on the benefits of scribes in the practice setting is increasing. Evidence indicated that in a variety of settings, such as the emergency department, specialty clinics, and outpatient arena, positive outcomes occurred for patients and providers (Arya, Salovich, Ohman-Strickland, & Merlin, 2010; Bastani, Shaqiri, Palomba, Bananno, & Anderson, 2013; Cabilan & Eley, 2015; Imdieke & Martel, 2017; Menon, 2015; Shultz & Holmstrom, 2015; Walker, Ben-Meir, O'Mullane, Phillips, & Staples, 2014; Yan et al., 2016). Bank and Gage (2015) found that during an outpatient health care visit providers using scribes saved approximately 2.5 hours during each scheduled clinic day. Bank and Gage added that providers were able to spend more time directly engaging with patients resulting in "increased face-to-face interaction with patients during a clinic visit without distraction from interaction with a computer" (p. 494).

Additionally, Bastani and colleagues (2013) discovered that the implementation of a scribe program positively impacted patient satisfaction and improved overall scores by 14%. The use of scribes also improved provider efficiencies allowing the physician to arrive on time to see the patient, thus enhancing the patient care experience and improving patient satisfaction (Bank & Gage, 2015). Similar to Bank and Gage (2015) findings, Bank and colleagues (2013) noted that "time spent in direct patient interaction (without using the computer) was over fourfold greater on scribe visits. Overall quality of the physician-patient interaction was also significantly better on scribe…visits" (p. 402).

These recent studies and literature conveyed the importance of considering utilization of scribes to alleviate the administrative burden and tasking of providers. This

facilitated their focus on the patient during the health care visit, strengthened the patient-provider relationship, and improved patient and provider experience. In the quest to provide high quality care and promote high reliability, the Surgeon General gave direction to advance patient experience, cultivate partnerships, and promote health for the Navy Medicine team and their beneficiaries (Wise, 2016). To this end, a quality improvement pilot project was implemented within the Family Medicine clinic to determine benefits of scribes on patient and provider experience consistent with the Surgeon General's direction.

Methods

This project was performed at a Military Treatment Facility (MTF) in the Family Practice outpatient setting during routine scheduled outpatient visits. The design was a non-experimental project using a mixed methods approach, qualitative and quantitative methodologies combined, to facilitate greater understanding of how scribes impact the patient and provider experience (Wisdom & Creswell, 2013). Additionally, a convenience sample of voluntary patient participants scheduled for an outpatient appointment was utilized. Similar to the literature, the providers to receive scribes and who were willing to participate in this pilot project were two male primary care physicians, a Family Practice doctor and an Internal Medicine doctor, in a patient-centered medical home port model. Four hospital corpsmen, three males, and one female, were selected as scribes, and were willing to participate in the project.

These corpsmen served as scribes during the project period after they received two weeks of training centered on orientation to the EHR, data entry into the EHR, creation of referrals, and scribe simulation in which the scribe was paired with their

designated physician in a training atmosphere with opportunities to perform scribe functions with a simulated patient. The scribes used designated laptops during the patient visit.

This quality improvement project evaluated two aspects of experience during the implementation of the scribes. These included the patient experience as indicated via a pre and post implementation questionnaire, and the provider experience as indicated via a pre and post implementation questionnaire.

Navy Medicine and the University of South Carolina Institutional Review Boards (IRB) considered this project exempt. Respective chain of command within the Navy identified and approved team members to participate. The participants were not pending any deployment or transfer orders. The questionnaires utilized in this pilot project were developed specifically for this initiative, in compliance with Navy Medicine guidelines, and approved for use.

Scribes, paired with the same physician throughout the project period, accompanied the provider during the patient visit to perform real-time documentation into the EHR. Patients provided verbal consent at the beginning of the appointment. During sensitive physical exams, scribes were excused from the room.

Prior to the launch of the scribes, patients willing to participate were surveyed via a printed questionnaire for one week. Of the initial 100 questionnaires given to patients, 89 were returned to the check out personnel. Patients that agreed to participate were also surveyed via a printed questionnaire during the final week (week six) of the pilot project with 96 questionnaires collected. Patients returned completed questionnaires to check out

personnel. For providers, printed questionnaires were disseminated and collected prior to the implementation of the pilot project and then three days after completion of the project.

The first part of the project occurred during a six-week period. Afterwards, the check in and check out times for patients was evaluated using a one-way ANOVA, and the Dunnett's C Post-hoc test of multiple comparisons during an additional six weeks. This provided an opportunity to analyze the efficiencies gained by providers when utilizing scribes, and was thought to be a beneficial addition in order to further support the value of this innovative quality improvement project. The number of days used in the one-way ANOVA, and the Dunnett's C Post-hoc test of multiple comparisons are different due to sporadic gaps in data capture during the designated periods.

IBM SPSS Statistics Version 21 software was used to assess the Mann-Whitney *U* tests on the patient experience with both the pre and post questionnaires. The Mann-Whitney *U* test was used to evaluate whether there was a statistically significant difference in patient satisfaction with the provider interaction when scribes were present. Additionally, other quantitative analysis to include a one-way ANOVA and the Dunnett's C Post-hoc test of multiple comparisons on the time efficiencies was performed. Since the constructs of the pre and post provider questionnaires were not congruent, further statistical analysis was not possible. To this end, an evaluation of the qualitative data was performed.

Results

From the patient perspective, the pre-implementation experience survey mean was 4.7 out of a possible 5, during the sixth week of the project implementation the patient experience mean dropped to 4.5 indicating that there was a slight decrease in experience, and during the twelfth week the patient experience mean increased to 4.9 demonstrating an overall improvement in experience when their provider used scribes. Further testing evaluated, the difference in patient satisfaction with their primary care physician interaction with the scribes present, and the patient overall experience during the medical visit with scribes present. The Mann-Whitney *U* test was used on the first group of patients that did not have scribes present during the medical visit (n=89), and the second group of patients that did have scribes present (n=96). The results of the test were significant, but not in the expected direction (z=-2.47, p= .014). The group with scribes had a mean rank of 86.10 and the group without scribe had a mean rank of 101.57, indicating that the group without scribes was more satisfied. While the test was significant (p= .014), the average scores for the two groups on the first questionnaire item were within a quarter point of each other at 4.72 and 4.52 respectively.

In order to evaluate whether there was a difference in the patient overall rating of the visit experience when scribes were present, a second Mann-Whitney *U* test was completed. The results were similar to the first test, and were significant but in the opposite expected direction (z=-2.5, p= .012). The overall experience mean was 102.03 for the group without scribes and 85.68 for the group with scribes. The mean score for the group with scribes was 4.65 and the mean score for the group with scribes was 4.47 out of a possible 5. The results for these two groups were statistically significant (p= .012),

but the mean scores on the two questionnaire items were less than 0.18, and not in the expected direction; therefore, indicating that patients were slightly more satisfied and overall experience was slightly higher when the scribe was not present.

Qualitatively, the two physicians using scribes indicated that they were more engaged with their patients, were able to close their notes within the 72-hour time period, and were not staying after hours to complete charting. Prior to the utilization of scribes each provider spent 20-26 hours after work charting in the EHR each week. After the initial six-week implementation of scribes, both providers reported that they were spending less than 10 hours per week. This was a remarkable improvement of at least 50% in time spent after hours documenting in the EHR. Both providers indicated that they were able to spend this time engaging more fully with patients, team members, and clinic support staff. This new scribe process allowed the providers to complete their scheduled appointments in a timely fashion and they were able to improve their work life balance. Upon attempting to run a quantitative analysis, it is important to note that the pre and post questionnaires did not utilize the same construct and this was not identified prior to the start of the project; therefore, further completion of statistical testing was not feasible.

Utilizing Clarke and Braun's (2017) thematic analysis approach, weekly debriefing session physician responses and post-project narrative comments were analyzed. Four themes emerged from the qualitative analysis of provider comments of improved efficiency, decreased time documenting in the EHR, improved experience when using scribes, and a concern that the presence of scribes may hinder the full transparency of a patient's concerns. To mitigate the concern of patient openness with

sensitive concerns, patients were told that at any point during the visit that the scribes could step out if they needed to discuss something private. This particular situation arose less than five times during the project period.

While the experience questionnaire results indicated a slightly decreased patient satisfaction and overall patient experience, the Navy Medicine patient satisfaction obtained through the Interactive Customer Evaluation (ICE) remained consistently at 100%, and the Joint Outpatient Experience Survey (JOES) remained at least 90% which indicated that there was no decrease in patient satisfaction or overall experience during the project. Qualitatively, the providers' experience improved with the decrease in time spent after hours documenting in the EHR, enhanced engagement with patient, staff, and ancillary team members, and improved work life balance as revealed in the weekly debriefing sessions, and post project narrative comments.

Additional Findings

The presence of the medical scribes improved clinic efficiency of time in the room. This was evaluated using a one-way ANOVA and the Dunnett's C Post-hoc test of multiple comparisons. The visit-elapsed time dependent variable (DV) was measured as a continuous measure in minutes. The check-out variable was a nominal measure of *Yes* for checked out and *No* for did not check out. The independent variable (IV), the scribe presence based on three different observations, had three levels including: (a) 51 days when the data was collected with no scribe present (phase one); (b) 17 days when the data was collected during the presence of a scribe (phase two); and (c) 72 days when the data was collected after increased training and presence of newly trained scribes during doctor

visits (phase three). Using a random sample of 250 observations from each of the three groups ($N = 750$), a one-way ANOVA was conducted to evaluate the difference in patient-visit elapsed time (DV) based on the presence of a scribe (IV). The underlying theory was that the presence of a scribe increased the overall efficiency of the clinic as measured by patient-visit elapsed time (Bastani et al., 2014; Bank & Gage, 2015; Cabilan & Eley, 2015). The continuous DV was measured in minutes and the nominal IV consisted of three levels: (a) pre-treatment (before scribe presence); (b) scribe present; and (c) continued scribe presence with increased training and rotation of scribes. Table 1 provides the descriptive statistics for the three levels. The results of the ANOVA were significant, $F(2, 747) = 5.90$, $p = .03$. There was a statistically significant difference (p= .03) in patient-visit elapsed time based on the presence of a scribe.

Table 2.1

Descriptive Statistics for the One-Way ANOVA (time efficiencies)

(p= .03)

Treatment	*N*	Mean	*SD*
Pre-intervention (Phase 1)	250	43.59	69.11
Scribe intervention (Phase 2)	250	30.30	36.96
Scribe continued with increased training (Phase 3)	250	30.06	43.45

Because the comparison of means test was significant, further interpretation on the multiple comparisons post-hoc test determines the extent to which the three

treatments differed. The Levene's test of homogeneity of variance was significant (p = .02), and therefore the Dunnett's C (equal variance not assumed) post-hoc test was used to interpret the comparison of the three observations. As shown in Table 2, for the pre-intervention comparison, the elapsed time decreased significantly when a scribe was present (-13.64 minutes), and the difference was slightly greater (-13.88 minutes) when additional training was provided to the scribes. The difference in the patient-visit elapsed time was much less, and still decreasing, when comparing the scribe-present and the continued scribe presence with increased training and rotation of scribes (-2.40 minutes). With this gained efficiency, providers were able to achieve an improved work-life balance and gain greater satisfaction during the work day by reducing the number of hours spent documenting after the work day from more than five to less than two, and completing the scheduled visits for each work day.

Table 2.2
The Dunnett's C Post-hoc Test of Multiple Comparisons between Scribe Interventions

Observation(I)	Comparison (J)	Mean Diff. (I-J)	Standard Error	Sig	95% Conf. Interval	
					Lower Bound	Upper Bound
Pre-intervention (Phase one)	Scribe	13.64*	4.96	.007	1.96	25.33
	Post- new Scribe	13.88*	5.16	.000	1.71	26.06

Scribe intervention (Phase two)	Pre-intervention	-13.64*	4.96	.010	-25.33	-1.96
	Post-intervention	.240	3.61	1.00	-8.28	8.75
Scribe continued with increased training (Phase three)	Pre-intervention	-13.88*	5.16	.008	-26.06	-1.71
	Scribe	-2.40	3.61	1.00	-8.75	8.27

* Mean difference is significant at the 0.05 level.

While not measured during this project, the hospital corpsmen trained to serve in the project scribe role provided anecdotal accounts that, indicated a drastic improvement in: a) their physical assessment skills; b) documentation skills; c) ability to proactively identify diagnosis; d) improved collaboration with their assigned provider; e) comfort level engaging with the patient; f) team cohesion and efficiency; and g) preparation to treat patients in the operational setting after having participated in the scribe project. This additional benefit to the project was in direct support of the Navy Surgeon General's mission of Readiness, Health and Partnerships (Health.mil, 2016).

Discussion

This quality improvement project demonstrated that the use of scribes in an outpatient setting reduced the administrative burden of physician documentation into the

EHR, and improved physician work life balance. While the patient experience revealed a slight decrease, this was shown to be less than .18. Additionally, throughout the project, patients were receptive to the scribes, and continued to provide positive experience feedback via ICE and JOES. These slight variations in these two factors revealed that the overall patient experience and satisfaction were not negatively impacted when using scribes.

This evidence-based emerging process highlighted the positive impact that scribes can have on fostering collaborative teamwork, and elevating a family practice clinic's efficiency among outpatient healthcare settings. Policies focused on the patient and provider experience that is centered on improving the patient and provider interaction and quality of the visit, as well as clinic and documentation efficiencies, will further strengthen the ability of organizations and individuals to promote high reliability and drive optimal patient and organizational outcomes.

The delivery of health care is a multifacted team approach in the fast-paced environment of evolving EHRs. Further study of the scribe's experience, especially given the positive qualitative comments from the hospital corpsmen that participated as scribes during the project period, could provide beneficial outcomes. The utilization of medical scribes strengthened physician experience. Future research centered on the provider experience could be beneficial to organizations. In multiple settings, documentation requirements burdened providers, and the consideration of scribes could foster work life balance, retention, and wellness.

Additionally, research focused on the development and validation of instruments to effectively measure patient and provider interaction with the presence of scribes, as well as, and the experience of providers and patients when using scribes would be beneficial. Navy Medicine is advancing every opportunity to strengthen clinical and operational readiness, health and partnership. This type of innovative evidence-based process, utilizing medical scribes in the outpatient primary care setting, could yield best practices and facilitate optimal patient and organizational outcomes.

Limitations included a need for a validated questionnaire for the pre and post patient and provider experience, and the small-scale size of the project minimized the generalizability of the project results.

Navy Medicine catalyzed initiatives to foster innovation in care delivery in order to streamline care and enhance the patient experience utilizing concepts of the quadruple aim (Beauvis, Richter, & Brezinski, 2017; Department of the Navy, 2010; Hudak et al., 2013; Military Health System, 2014). Providing world class care to our nation's most deserving citizens is an honor and privilege, and the quest for maximizing patient outcomes is on the forefront of the minds of our nation's leaders (Cooper, 2016; Military Health System, 2014). To improve communication and engage patients in their care, it is crucial for organizations to scrutinize the needs of their patient population and determine innovative strategies that will facilitate effective partnerships with our patients (Agency for Healthcare Research and Quality, 2017).

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References

Agency for Healthcare Research and Quality (2017, March). *Guide to improving patient safety in primary care settings by engaging patients and families [Executive summary].* Retrieved from https://www.ahrq.gov/professionals/quality-patient-safety/patient-family-engagement/pfeprimarycare/envscan-exec-summary.html

Allen, B., Banapoor, B., Weeks, E. C., & Payton, T. (2014). An assessment of emergency department throughput and provider satisfaction after the implementation of a scribe program. *Advances in Emergency Medicine,* 1-7. doi: 10.1155/2014/517319

Arya, R., Salovich, D. M., Ohman-Strickland, P., & Merlin, M. A. (2010). Impact of scribes on performance indicators in the emergency department. *Academic Emergency Medicine*, *17*, 490-494. doi 10.1111/j.1553-2712.2010.00718.x

Bank, A. J., & Gage, R. M. (2015, September 30). Annual impact of scribes on physician productivity and revenue in a cardiology clinic. *ClinicoEconomics and Outcomes Research*, *7,* 489-495. doi: 10.2147/CEOR.S89329

Bank, A. J., Obetz, C., Konrardy, A., Khan, A., Pillai, K. M., McKinley, B. J., Gage, R. M., Turnbull, M. A., & Kenney, W. O. (2013, August). Impact of scribes on patient interaction, productivity, and revenue in a cardiology clinic: a prospective study. *ClinicoEconomics and Outcomes Research*, *5,* 399-406. doi: 10.2147/CEOR.S49010

Bastani, A., Shaqiri, B., Palomba, K., Bananno, D., & Anderson, W. (2013). An ED scribe program is able to improve throughput time and patient satisfaction.

American Journal of Emergency Medicine, 32, 399-402. doi: 10.1016/j.ajem2013.03.040

Beauvais, B., Richter, J., & Brezinski, P. (2017). Fix these first: How the world's leading companies point the way toward high reliability in the Military Health System. *Journal of Healthcare Management, 62*(3), 209-210. doi: 10.1097/JHM-D-17-00041

Cabilan, C. J., & Eley, R. M. (2015). Review article: Potential of medical scribes to allay the burden of documentation and enhance efficiency in Australian emergency departments. *Emergency Medicine Australasia, 27*, 507-511. doi: 10.1111/1742-6723.12460

Carnes, K. M., de Riese, C. S., & de Riese, W. T. (2015). A cost-benefit analysis of medical scribes and electronic medical record system in an academic urology clinic. *Urology Practice Journal, 2*, 101-105. doi:10.1016/j.urpr.2014.10.006

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology, 12*(3), 297-298. doi: 10.1080/17439760.2016.1262613

Cooper. T. (2016, Dec.). What's on the horizon for the Military Health System? *Health Care Current [Peer commentary on Military Health System news and development]*. Retrieved from

https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/health-care-current-december13-2016.html

Department of the Navy. (2010). *BUMED INSTRUCTION 6300.19: Primary care services in Navy Medicine [electronic copy of Naval instruction]*. Retrieved from http://www.med.navy.mil/directives/ExternalDirectives/6300.19.pdf

Health.mil. (2016, October). *Navy Surgeon General announces new strategic priorities.* Retrieved from https://health.mil/News/Articles/2016/11/16/Navy-Surgeon-General-announces-new-strategic-priorities

Hess, J. J., Wallenstein, J., Ackerman, J. D., Akhter, M., Ander, D., Keady, M. T., & Capes, J. P. (2015). Scribes impact on provider experience, operations, and teaching in an academic emergency medicine practice. *Western Journal of Emergency Medicine, 16*(5), 602-610. doi: 10.5811/westjem.2015.6.25432

Hudak, R. P., Julian, R., Kugler, J., Dorrance, K., Ramchandani, S., Lynch, S., … Reeves, M. (2013). The patient-centered medical home: A case study in transforming the Military Health System. *Military Medicine*, *178*(2), 146-152. doi: 10.7205/MILMED-D-12-00170.

Imdieke, B. H. & Martel, M. L. (2017). Integration of medical scribes in the primary care setting improving satisfaction. *Journal of Ambulatory Care Manager, 40*(1), 17-25. doi: 10.1097/JAC.0000000000000168

Koshy, S., Feustel, P., Hong, M., & Kogan, B. (2010). Scribes in an ambulatory urology practice: Patient and physician satisfaction. *The Journal of Urology, 184*, 258-262. doi: 10.1016/j.juro.2010.03.040

Kosowsky, J. (2015). The effect and impact scribes can have on patient experience [electronic copy]. Retrieved from https://www.studergroup.com/resources/news-media/healthcare-publications-resources/insights/october-2015/the-effect-and-impact-scribes-can-have-on-patient

Menon, S. P. (2015). Maximizing time with the patient: The creative concept of a physician scribe. *Palliative Medicine*, *17*, 57-59. doi: 10.1007/s11912-015-0484-7

Military Health System. (2014). *Military Health System review. Final report [electronic copy]*. Retrieved from https://health.mil/Military-Health-Topics/Access-Cost-Quality-and-Safety/MHS-Review

Shachak, A., & Reis, S. (2009). The impact of electronic medical records on patient-doctor communication during consultation: A narrative literature review. *Journal of Evaluation in Clinical Practice, 15*, 641-649. doi: 10.1111/j.1365-2753.2008.01065.x

Shultz, C. G., & Holmstrom, H. L. (2015). The use of medical scribes in health care settings: A systematic review and future directions. *Journal of the American Board of Family Medicine*, *28*(3), 371-381. doi: 10.3122/jabfm.2015.03.140224

Walker, K., Ben-Meir, M., O'Mullane, P., Phillips, D., & Staples, M. (2014). Scribes in an Australian private emergency department: A description of physician productivity. *Emergency Medicine Australasia, 26*, 543-548. doi: 10.1111/1742-6723.12314

Wisdom, J., & Creswell, J. W. (2013). *Mixed methods: Integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models [electronic copy]*. Retrieved from https://pcmh.ahrq.gov/page/mixed-methods-integrating-quantitative-and-qualitative-data-collection-and-analysis-while

Wise, J. (2016, November). Navy Surgeon General announces new strategic priorities [electronic copy]. *America's Navy*. Retrieved from http://www.navy.mil/submit/display.asp?story_id=97670

Yan, C., Rose, S., Rothberg, M. B., Mercer, M. B., Goodman, K., & Misra-Hebert, A. D. (2016). Physician, scribe, and patient perspectives on clinical scribes in primary care. *Journal of General Internal Medicine, 31*(9), 990-995. doi: 10.1007/s11606-01603719x7

Zolnierek, K. B. H., & DiMatteo, M. R. (2009). Physician communication and patient adherence to treatment: A meta-analysis. *Medical Care, 47*(8), 826-834. doi: 10.1097/MLR.0b013e31819a5acc

CHAPTER 3

FINDINGS AND CONCLUSION

Project results provided insight into the impact of medical scribes on patient and provider experience in a military outpatient clinic setting. This quality improvement project evaluated two aspects of experience. These included the patient experience as indicated via a pre and post implementation questionnaire, and the provider experience as indicated via a pre and post implementation questionnaire.

From the patient perspective, the pre-implementation experience survey mean was 4.7 out of a possible 5, during the sixth week of the project implementation the patient experience mean dropped to 4.5 indicating that there was a slight decrease in experience, and then during the twelfth week the patient experience mean increased to 4.9 demonstrating an overall improvement in experience when their provider used scribes. Further testing, using IBM SPSS Statistics Version 21 software, evaluated the difference in patient satisfaction with their primary care physician interaction with the scribes present, and the patient overall experience during the medical visit with scribes present. The Mann-Whitney *U* test was used on the first group of patients that did not have scribes present during the medical visit (n=89), and the second group of patients that did have scribes present (n=96). The results of the test were significant, but not in the expected direction (z=-2.47, p= .014). The group with scribes had a mean rank of 86.10 and the group without scribe had a mean rank of 101.57, indicating that the group without scribes

was more satisfied. While the test was significant (p= .014), the average scores for the two groups on the first questionnaire item were within a quarter point of each other at 4.72 and 4.52 respectively.

In order to evaluate whether there was a difference in the patient overall rating of the visit experience when scribes were present, a second Mann-Whitney *U* test was completed. The results were similar to the first test, significant but in the opposite expected direction (z=-2.5, p= .012). The overall experience mean was 102.03 for the group without scribes and 85.68 for the group with scribes. The mean score for the group with scribes was 4.65 and the mean score for the group with scribes was 4.47 out of a possible 5. The results for these two groups were statistically significant (p= .012), but the mean scores on the two questionnaire items were less than 0.18, and not in the expected direction; therefore, indicating that patients were slightly more satisfied and overall experience was slightly higher when the scribe was not present. Additionally, throughout the project, patients were receptive to the scribes, and continued to provide positive experience feedback via the Interactive Customer Evaluation (ICE), and the Joint Outpatient Experience Survey (JOES). The slight variation in these two factors revealed that the overall patient experience and satisfaction were not negatively impacted when using scribes.

Qualitatively, the two physicians using scribes indicated that they were more engaged with their patients, were able to close their notes within the 72-hour time period as per Navy requirements, and were not staying after hours to complete charting. Prior to the utilization of scribes each provider spent 20-26 hours after work charting in the electronic health record (EHR) each week. After the initial six-week implementation of

scribes, both providers reported that they were spending less than 10 hours per week. This was a remarkable improvement of at least 50% in time spent after hours documenting in the EHR. Both providers indicated that they were able to spend this time engaging more fully with patients, team members, and other clinic support staff. This new scribe process allowed the providers to complete their scheduled appointments in a timely fashion and improved their work life balance. Upon attempting to run a quantitative analysis, it is important to note that the pre and post questionnaires did not utilize the same construct and this was not identified prior to the start of the project; therefore, further completion of statistical testing was not feasible.

Utilizing Clarke and Braun's (2017) thematic analysis approach, weekly debriefing session physician responses and post-project narrative comments were analyzed. Four themes from the qualitative analysis of provider comments of improved efficiency, decreased time documenting in the EHR, improved experience when using scribes, and a concern that the presence of scribes may hinder the full transparency of a patient's concerns. To mitigate the concern of patient openness with sensitive concerns, patients were told that at any point during the visit scribes could step out if they needed privacy. This particular situation only arose less than five times during the project period.

While the experience questionnaire results indicated a slightly decreased patient satisfaction and overall patient experience, the Navy Medicine patient satisfaction obtained through the Interactive Customer Evaluation (ICE) remained consistently at 100%, and the Joint Outpatient Experience Survey (JOES) remained at least 90% which indicated that there was no decrease in patient satisfaction or overall experience during

the project. Qualitatively, the providers' experience improved with a) the decrease in time spent after hours documenting in the EHR, b) enhanced engagement with patient, staff, and ancillary team members, and c) improved work life balance as revealed in the weekly debriefing sessions, and post project narrative comments.

Sustainability

The ambulatory clinic was implementing several quality improvement projects during the previous months, and the climate was conducive for a project of this nature. Leadership was highly supportive and interested in this type of quality improvement project. Given this environment, and utilizing the principles of Kotter (2017), change management was guided for long-term sustainability. The use of scribes is an interest in Navy Medicine, and this project may facilitate understanding of the impact scribes can bring to an organization prior to utilizing in other outpatient settings to enhance patient and organizational outcomes. Plans to expand the scribe utilization to other physicians, and nurse practitioners is under consideration given the positive outcomes of this project.

Additional Findings

The presence of the medical scribes improved clinic efficiency of time in the room. This was evaluated using a one-way ANOVA, and the Dunnett's C Post-hoc test of multiple comparisons. The visit-elapsed time dependent variable (DV) was measured as a continuous measure in minutes. The check-out variable was a nominal measure of *Yes* for checked out and *No* for did not check out. The independent variable (IV), the scribe presence based on three different observations, had three levels including: (a) 51 days when the data was collected with no scribe present (phase one); (b) 17 days when the data

was collected during the presence of a scribe (phase two); and (c) 72 days when the data was collected after increased training and presence of newly trained scribes during doctor visits (phase three). Using a random sample of 250 observations from each of the three groups ($N = 750$), a one-way ANOVA was conducted to evaluate the difference in patient-visit elapsed time (DV) based on the presence of a scribe (IV). The underlying theory was that the presence of a scribe increased the overall efficiency of the clinic as measured by patient-visit elapsed time (Bastani et al., 2014; Bank & Gage, 2015; Cabilan & Eley, 2015). The continuous DV was measured in minutes and the nominal IV consisted of three levels: (a) pre-treatment (before scribe presence); (b) scribe present; and (c) continued scribe presence with increased training and rotation of scribes. Table 3.1 provides the descriptive statistics for the three levels. The results of the ANOVA were significant, $F(2, 747) = 5.90$, $p = .03$. There was a statistically significant difference (p= .03) in patient-visit elapsed time based on the presence of a scribe.

Table 3.1

Descriptive Statistics for the One-Way ANOVA (time efficiencies) (p= .03)

Treatment	*N*	Mean	*SD*
Pre-intervention (Phase 1)	250	43.59	69.11
Scribe intervention (Phase 2)	250	30.30	36.96
Scribe continued with increased training (Phase 3)	250	30.06	43.45

Because the comparison of means test was significant, further interpretation on the multiple comparisons post-hoc test determined the extent to which the three treatments differed. The Levene's test of homogeneity of variance was significant (p = .02), and therefore the Dunnett's C (equal variance not assumed) post-hoc test was used to interpret the comparison of the three observations. As shown in Table 3.2 for the pre-intervention comparison, the elapsed time decreased significantly when a scribe was present (-13.64 minutes), and the difference was slightly greater (-13.88 minutes) when using scribes who had received additional training. The difference in the patient-visit elapsed time was much less, and still decreasing, when comparing the scribe-present and the continued scribe presence with increased training and rotation of scribes (-2.40 minutes). With the decreased visit time, providers were able to achieve an improved work life balance and gain greater satisfaction during the work day by reducing the number of hours spent documenting after the work day from more than five to less than two, and completing the scheduled visits for each work day.

Table 3.2

The Dunnett's C Post-hoc Test of Multiple Comparisons between Scribe Interventions

Observation(I)	Comparison (J)	Mean Diff. (I-J)	Standard Error	Sig	95% Conf. Interval	
					Lower Bound	Upper Bound
Pre-intervention (Phase one)	Scribe	13.64*	4.96	.007	1.96	25.33
	Post- new Scribe	13.88*	5.16	.000	1.71	26.06

Scribe intervention (Phase two)	Pre-intervention	-13.64*	4.96	.010	-25.33	-1.96
	Post-intervention	.240	3.61	1.00	-8.28	8.75
Scribe continued with increased training (Phase three)	Pre-intervention	-13.88*	5.16	.008	-26.06	-1.71
	Scribe	-2.40	3.61	1.00	-8.75	8.27

* Mean difference is significant at the 0.05 level.

Furthermore, a statistical process control chart was created from this same data. Tables 3.3 through 3.5 highlight the upper and lower statistical control limits for each phase of the project and display the variability within each one. These tables were separated to ease the readability of each chart. When the chart contained all three phases, it was small and difficult to visualize. As shown in Table 3.3, phase one of the pre-scribe period, the upper and lower control limits are wide and there was great variability throughout this period which demonstrated the need for a process improvement. In Table 3.4, phase two, the initial scribe intervention period, is displayed with a tighter upper and lower control limits. While the control limits are smaller, there is variation among the data which indicated that there were still variables affecting the process. Such variables included illness of scribe or scribe not assigned to provider because of another clinic staffing demand. To mitigate this, leadership worked together to minimize disruption of the scribe assignment, but this could not totally be eliminated due to variables beyond the control of the project team. Additionally, short variations are seen with routine checkup

appointments while longer variations are seen with new diagnosis, and complex patient appointments. Within Table 3.5, phase three, the increased scribe training with rotation of scribes is displayed with even tighter upper and lower control limits. With the control limits lowered during this period, further improvement was indicated yet there were still confounding variables as mentioned above that created variability within this phase. These variabilities indicate that there is an opportunity to consider staffing and scheduling methods and models that would facilitate greater statistical control and ensure that the pilot project could fully do what it was designed to do in this practice setting.

Table 3.3

Statistical Process Control Chart – Pre-Scribe- Phase One

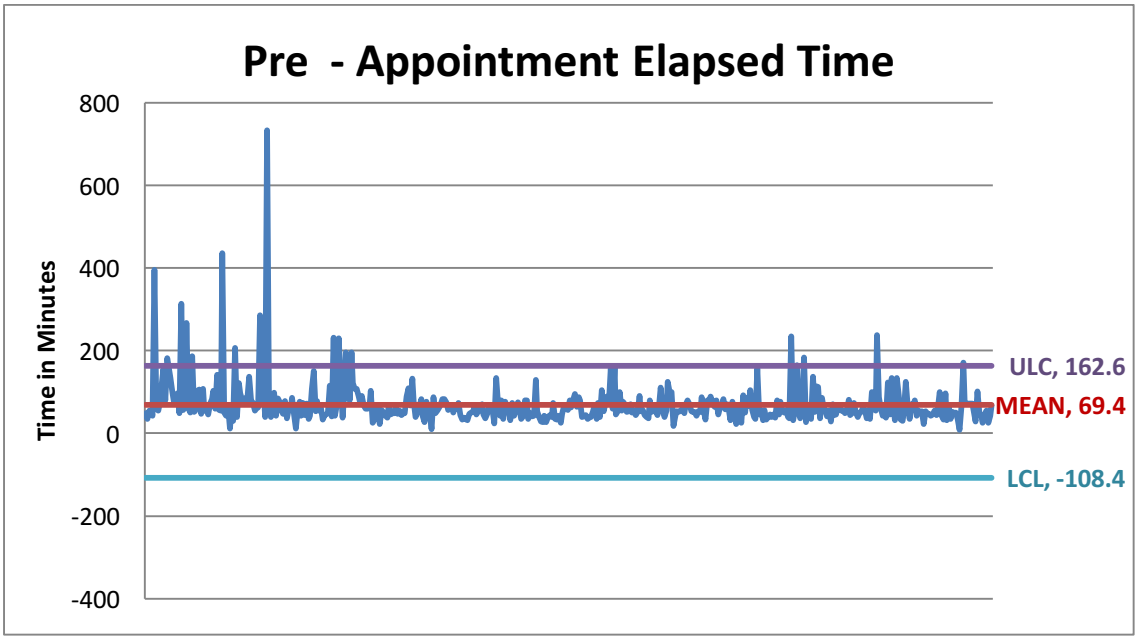


Table 3.4

Statistical Process Control Chart – Initial Scribe Implementation- Phase Two

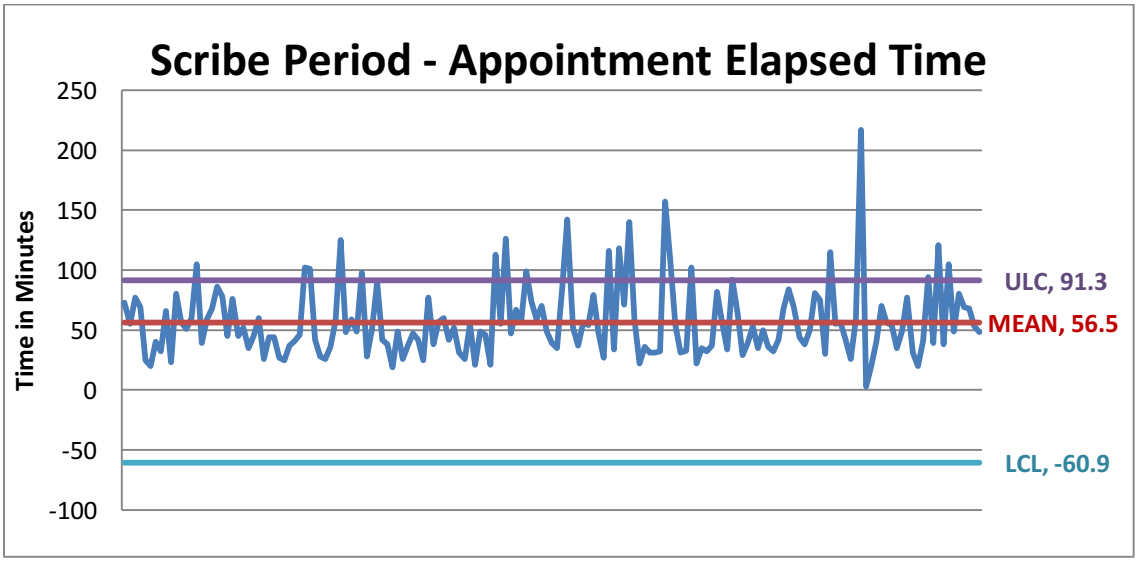
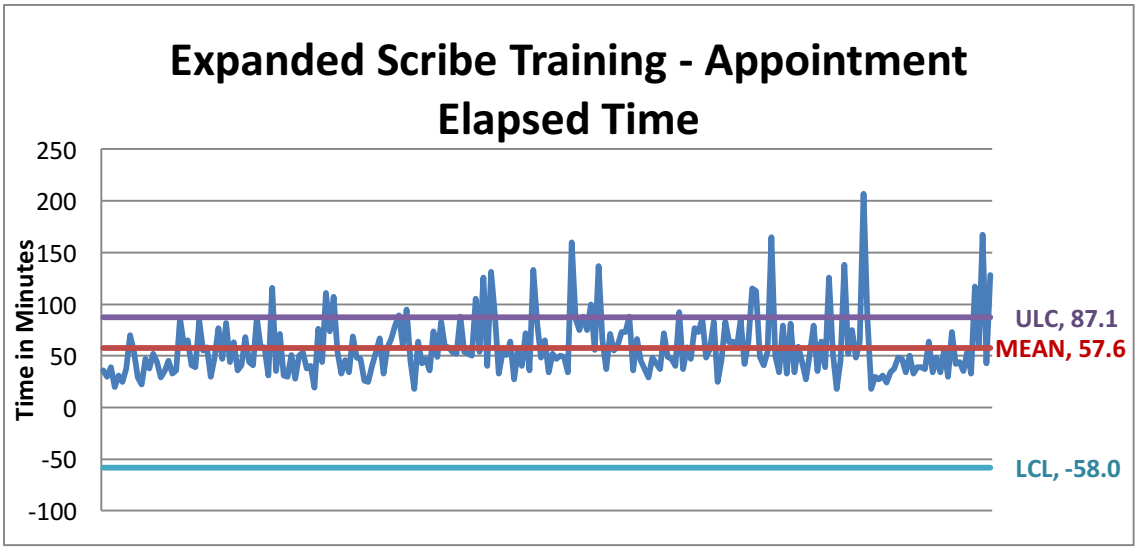


Table 3.5

Statistical Process Control Chart – Scribes Continued with Increased Training- Phase Three



Additionally, prior to the launch of the project the two designated providers were unable to close out their notes within the 72-hour required time frame. After the implementation of scribes, there was an improvement in their note closures. One provider gained a 100% completion while the other achieved a 99% completion allowing providers to meet the Navy Medicine (NM) benchmarks of 97% for this particular metric.

While not measured during this project, the hospital corpsmen trained to serve in the project scribe role provided anecdotal accounts that, indicated a drastic improvement in: a) their physical assessment skills; b) documentation skills; c) ability to proactively identify diagnosis; d) improved collaboration with their assigned provider; e) comfort level engaging with the patient; f) team cohesion and efficiency; and g) preparation to treat patients in the operational setting after having participated in the scribe project. This additional benefit to the project was in direct support of the Navy Surgeon General's mission of Readiness: ensuring training and skills are able to save lives, Health: ensuring provision of enhanced patient experience, and outcomes, and Partnerships: ensuring strengthened collaboration among team members (Health.mil, 2016).

Organizations that implement medical scribes in the primary care outpatient setting can improve provider experience, and clinic and documentation efficiencies (Allen et al., 2014; Bastani et al., 2014; Bank & Gage, 2015; Cabilan & Eley, 2015; Hess et al., 2015; Koshy et al., 2010; Menon, 2015; Shultz & Holmstrom, 2015). With the project's limitation of size, further investigation could be conducted on patient experience in the outpatient setting to validate the benefits to patient experience given the variation between the questionnaire analysis and positive comments from ICE and JOES. The expanded scope of the project provided implications for nursing practice, health policy,

leadership, and directions for future evidence-based projects as indicated further in the body of this paper.

Implications for Nursing Practice

The use of medical scribes is an excellent opportunity to enhance provider experience and improve clinic efficiency which can provide an avenue for more direct time communicating and engaging with the patient fostering positive patient outcomes (Bastani et al., 2014; Cabilan & Eley, 2015; Hess et al., 2015; Koshy et al., 2010; Menon, 2015; Shachak & Reis, 2009). Organizations using medical scribes improved their providers' ability to operate at their highest level of skill and enhanced their work-life balance. Previous work found that this minimized burn out and promoted wellness (Allen et al., 2014; Shultz & Holmstrom, 2015). These same benefits could be reciprocated for advanced nurse practitioners (APNs) in an ambulatory setting, and future quality improvement projects utilizing APNs is recommended. Additionally, evaluation of the types of leadership and management skills necessary for the clinic nurse manager to empower corpsmen to serve as scribes and engage in innovative quality improvement projects could be helpful.

While the project results, revealed a small decrease in overall patient experience and satisfaction when utilizing scribes, the mean score slight differences indicate that there could be an opportunity to enhance the patient experience. Further exploration should focus on the impact that scribes have on the patient and provider interaction. The development of a validated instrument to evaluate the provider and patient interaction and experience would also be beneficial.

Implications for Health Policy

Navy Medicine has catalyzed initiatives to foster innovation in care delivery to streamline care, and enhance the patient experience utilizing concepts of the quadruple aim. (Beauvis, Richter, & Brezinski, 2017; Department of the Navy, 2010; Hudak et al., 2013; Military Health System, 2014). Providing world class care to our nation's most deserving citizens is an honor and privilege, and the quest for maximizing patient outcomes is on the forefront of the minds of our nation's leaders (Cooper, 2016; Military Health System, 2014). To improve communication and engage patients in their care, it is crucial for organizations to scrutinize the needs of their patient population and determine innovative strategies that will facilitate effective partnerships with our patients (Agency for Healthcare Research and Quality, 2017).

While the results of the project revealed a slightly decreased patient satisfaction and experience, the use of medical scribes is an evidence-based, emerging process that has been shown to enhance the patient experience, foster collaborative teamwork, and elevate a clinic's efficiency among outpatient healthcare settings. Future practice changes focused on the patient and provider experience that is centered on improving the patient and provider interaction and quality of the visit, as well as clinic and documentation efficiencies, will further strengthen the ability of organizations and individuals to promote high reliability and drive optimal patient and organizational outcomes.

Implications for Leadership

The Navy Surgeon General has set forth guidelines for Navy military healthcare organizations centered on readiness, health, and partnerships (Health.mil, 2016). Additionally, the Defense Health Agency strives to improve the patient experience of

care and staff clinical and operational readiness (Cooper, 2016). To this end, leaders are charged with the responsibility to provide innovative solutions to practice challenges. This project's outcomes advise health system administrators to evaluate the improved quality that medical scribes can bring to an organization. Leadership opportunities exist to promote a culture where all members of the team, patient, provider, and scribe are able to effectively work together to enhance collaboration, communication, experience, and outcomes. Innovation such as the medical scribe program can position organizations to excel in these diverse areas.

Direction for Future Evidence-Based Projects

The delivery of health care is a multifaceted team approach in the fast-paced environment of evolving electronic health care records. Further study of the scribe's experience, especially given the positive comments from the hospital corpsmen that participated as scribes during the project period, could provide beneficial outcomes. The provider experience was improved through the utilization of medical scribes, so future evaluation centered on the provider experience could be beneficial to organizations. In multiple settings, documentation requirements burdened providers, and the consideration of scribes could foster work life balance, retention, and wellness.

Additionally, research centered on the development of validated instruments to effectively measure patient and provider interaction with the presence of scribes, as well as, the experience of providers and patients when using scribes would be beneficial. Furthermore, the collection of demographics in future projects will enhance the author's ability to identify causal factors that may influence fluctuations in experience and time efficiencies. Navy Medicine is advancing every opportunity to strengthen clinical and

operational readiness, health and partnerships to provide the highest quality care and promote wellness for our patients. This type of innovative evidence-based process, utilizing medical scribes in the outpatient primary care setting, could yield best practices and facilitate optimal patient and organizational outcomes.

Dissemination of Activities

This scribe project is in the process of dissemination for publication to Military Medicine, and an abstract of this project is in the process of being submitted to the Association of Military Surgeons of the United States (AMSUS) conference on November 26- December 1, 2018.

Article submission –

An article titled "Scribes Impact on Patient and Provider Experience in the Outpatient Setting" is in the process of finalization for consideration to Military Medicine.

CAPT Kimberly A. Taylor, NC USN, Deb McQuilkin, DNP, Ronda G. Hughes, PhD (2017). Scribes impact on patient and provider experience in the outpatient setting. To be submitted to *Military Medicine*.

Abstract submission -

An abstract titled, Scribes Impact on Patient and Provider Experience in the Outpatient Setting will be submitted for presentation to the Association of Military Surgeons of the United States (AMSUS) 127th annual conference to be held November 26- December 1, 2018 in Washington, D.C.

Taylor, K. A., McQuilkin, D., & Hughes, R. G. (2017). Scribes impact on patient and provider experience in the outpatient setting. To be submitted to the Association of Military Surgeons of the United States (AMSUS) 127th annual conference to be held November 26- December 1, 2018 in Washington, D.C. Poster presentation.

REFERENCES

Agency for Healthcare Research and Quality (2017, March). *Guide to improving patient safety in primary care settings by engaging patients and families [Executive summary].* Retrieved from https://www.ahrq.gov/professionals/quality-patient-safety/patient-family-engagement/pfeprimarycare/envscan-exec-summary.html

Allen, B., Banapoor, B., Weeks, E. C., & Payton, T. (2014). An assessment of emergency department throughput and provider satisfaction after the implementation of a scribe program. *Advances in Emergency Medicine,* 1-7. doi: 10.1155/2014/517319

Arya, R., Salovich, D. M., Ohman-Strickland, P., & Merlin, M. A. (2010). Impact of scribes on performance indicators in the emergency department. *Academic Emergency Medicine*, *17*, 490-494. doi 10.1111/j.1553-2712.2010.00718.x

Bank, A. J., & Gage, R. M. (2015, September). Annual impact of scribes on physician productivity and revenue in a cardiology clinic. *ClinicoEconomics and Outcomes Research*, *7,* 489-495. doi: 10.2147/CEOR.S89329

Bank, A. J., Obetz, C., Konrardy, A., Khan, A., Pillai, K. M., McKinley, B. J., Gage, R. M., Turnbull, M. A., & Kenney, W. O. (2013, August). Impact of scribes on patient interaction, productivity, and revenue in a cardiology clinic: a prospective study. *ClinicoEconomics and Outcomes Research*, *5,* 399-406. doi: 10.2147/CEOR.S49010

Bastani, A., Shaqiri, B., Palomba, K., Bananno, D., & Anderson, W. (2013). An ED scribe program is able to improve throughput time and patient satisfaction. *American Journal of Emergency Medicine, 32*, 399-402. doi: 10.1016/j.ajem2013.03.040

Beauvais, B., Richter, J., & Brezinski, P. (2017). Fix these first: How the world's leading companies point the way toward high reliability in the Military Health System. *Journal of Healthcare Management, 62*(3), 209-210. doi: 10.1097/JHM-D-17-00041

Cabilan, C. J., & Eley, R. M. (2015). Review article: Potential of medical scribes to allay the burden of documentation and enhance efficiency in Australian emergency departments. *Emergency Medicine Australasia, 27*, 507-511. doi: 10.1111/1742-6723.12460

Carnes, K. M., de Riese, C. S., & de Riese, W. T. (2015). A cost-benefit analysis of medical scribes and electronic medical record system in an academic urology clinic. *Urology Practice Journal, 2*, 101-105. doi:10.1016/j.urpr.2014.10.006

Clarke, V., & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology, 12*(3), 297-298. doi: 10.1080/17439760.2016.1262613

Cooper. T. (2016, Dec.). What's on the horizon for the Military Health System? *Health Care Current [Peer commentary on Military Health System news and development]*. Retrieved from https://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/health-care-current-december13-2016.html

Dearholt, S. L., & Dang, D. (2012). *John Hopkins Nursing Evidence-Based Practice: Models and Guidelines [electronic copy]*. Retrieved from http://site.ebrary.com.pallas2.tcl.sc.edu/lib/southcarolina/reader.action?docID=10540866&ppg=56

Department of the Navy. (2010). *BUMED INSTRUCTION 6300.19: Primary care services in Navy Medicine [electronic copy of Naval instruction]*. Retrieved from http://www.med.navy.mil/directives/ExternalDirectives/6300.19.pdf

Health.mil. (2016, October). *Navy Surgeon General announces new strategic priorities*. Retrieved from https://health.mil/News/Articles/2016/11/16/Navy-Surgeon-General-announces-new-strategic-priorities

Hess, J. J., Wallenstein, J., Ackerman, J. D., Akhter, M., Ander, D., Keady, M. T., & Capes, J. P. (2015). Scribes impact on provider experience, operations, and teaching in an academic emergency medicine practice. *Western Journal of Emergency Medicine, 16*(5), 602-610. doi: 10.5811/westjem.2015.6.25432

Hudak, R. P., Julian, R., Kugler, J., Dorrance, K., Ramchandani, S., Lynch, S., … Reeves, M. (2013). The patient-centered medical home: A case study in transforming the Military Health System. *Military Medicine*, *178*(2), 146-152. doi: 10.7205/MILMED-D-12-00170

Imdieke, B. H. & Martel, M. L. (2017). Integration of medical scribes in the primary care setting improving satisfaction. *Journal of Ambulatory Care Manager, 40*(1), 17-25. doi: 10.1097/JAC.0000000000000168

Koshy, S., Feustel, P., Hong, M., & Kogan, B. (2010). Scribes in an ambulatory urology practice: Patient and physician satisfaction. *The Journal of Urology, 184*, 258-262. doi: 10.1016/j.juro.2010.03.040

Kosowsky, J. (2015). The effect and impact scribes can have on patient experience [electronic copy]. Retrieved from https://www.studergroup.com/resources/news-media/healthcare-publications-resources/insights/october-2015/the-effect-and-impact-scribes-can-have-on-patient

Kotter, J. (2017). 8 step process [web page]. *Kotter International.* Retrieved http://www.kotterinternational.com/8-steps-process-for-leading-change/

Kreamer, J., Rosen, B., Susie-Lattner, D., & Baker, R. (2015). The economic impact of medical scribes in hospitals [electronic copy]. *Physician Leadership Journal*, 37-41. Retrieved from https://www.physicianleaders.org/publications/journal

Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-based practice in nursing & healthcare: A guide to best practice.* (3rd ed.). Philadelphia: Wolters Kluwer Health.

Menon, S. P. (2015). Maximizing time with the patient: The creative concept of a physician scribe. *Palliative Medicine*, *17*, 57-59. doi: 10.1007/s11912-015-0484-7

Military Health System. (2014). *Military Health System review. Final report [electronic copy]*. Retrieved from https://health.mil/Military-Health-Topics/Access-Cost-Quality-and-Safety/MHS-Review

Shachak, A., & Reis, S. (2009). The impact of electronic medical records on patient-doctor communication during consultation: A narrative literature review. *Journal of Evaluation in Clinical Practice, 15*, 641-649. doi: 10.1111/j.1365-2753.2008.01065.x

Shultz, C. G., & Holmstrom, H. L. (2015). The use of medical scribes in health care settings: A systematic review and future directions. *Journal of the American Board of Family Medicine*, *28*(3), 371-381. doi: 10.3122/jabfm.2015.03.140224

Walker, K., Ben-Meir, M., O'Mullane, P., Phillips, D., & Staples, M. (2014). Scribes in an Australian private emergency department: A description of physician productivity. *Emergency Medicine Australasia, 26*, 543-548. doi: 10.1111/1742-6723.12314

Wisdom, J., & Creswell, J. W. (2013). *Mixed methods: Integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models [electronic copy]*. Retrieved from https://pcmh.ahrq.gov/page/mixed-methods-integrating-quantitative-and-qualitative-data-collection-and-analysis-while

Wise, J. (2016, November). Navy Surgeon General announces new strategic priorities [electronic copy]. *America's Navy*. Retrieved from http://www.navy.mil/submit/display.asp?story_id=97670

Yan, C., Rose, S., Rothberg, M. B., Mercer, M. B., Goodman, K., & Misra-Hebert, A. D. (2016). Physician, scribe, and patient perspectives on clinical scribes in primary care. *Journal of General Internal Medicine, 31*(9), 990-995. doi: 10.1007/s11606-01603719x7

Zolnierek, K. B. H., & DiMatteo, M. R. (2009). Physician communication and patient adherence to treatment: A meta-analysis. *Medical Care, 47*(8). doi: 10.1097/MLR.0b013e31819a5acc