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IMPLEMENTING AN ALGORITHM FOR HEADACHE
MANAGEMENT IN A PATIENT CENTERED MEDICAL HOME
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Implementing an Algorithm for Headache Management in a Patient-Centered Medical Home

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Abstract

Globally, headache disorders affect people of all ages, genders, and ethnic and socio-economic backgrounds. Recurrent headaches are responsible for poor quality of life, personal and social adversities, and increased financial burdens. Headaches are the most common complaint among neurological disorders, yet many are misdiagnosed and undertreated. In 2020, the U.S. Department of Veteran Affairs and the Department of Defense (VA/DoD) released an evidence-based clinical practice guideline (CPG), *The Primary Care Management of Headaches*. The objective of this quality improvement (QI) project was to implement the use of the VA/DoD CPG algorithm among clinic providers at a military primary care, patient-centered medical home located in the Southwest for patients aged at least 18 years who presented with a complaint of headache. Before implementation of this CPG, no standardized practice existed for diagnosing and treating headache disorders at the clinic. Diagnosis and treatment of headache disorders were often left to the individual providers discretion, not evidence-based practice. The aims of this QI project were to standardize the management and treatment of headache disorders among primary care providers, improve provider efficiency, and improve overall patient outcomes. Providers' adherence to the CPG was measured using headache diagnosis codes from *International Statistical Classification of Disease and Related Health Problems,* 10th edition (*ICD-10).* The results showed a decrease in the use of *unspecified headache* and *other* headache diagnoses as well as an increase in specific headache diagnoses postimplementation in 3 of the 6 clinic providers. Improvement was noted in *ICD-10* headache coding practices by all clinic providers after repeated in-person in-service trainings. CPG use is an effective way to disseminate evidence-based recommendations into clinical practice. However, sustainment will require ongoing education.

Implementing an Algorithm for Headache Management in a Patient-Centered Medical Home

Introduction

Headache disorders are a global issue that has affected people worldwide for many years. Evidence of headache disorders can be traced back to ancient civilizations. In 1200 B.C., the Ebers Papyrus, one of the first written Egyptian medical books, contained documentation of headache, migraine, and neuralgia pain symptoms and treatments (Popko, 2018). In his writings dated circa 400 A.D., Hippocrates, the father of medicine, wrote descriptive passages on headache symptoms. In 200 A.D., Aretaeus, a Greek physician who followed Hippocrates teachings, developed the first classification system for headache disorders and is also credited with describing the first migraine headache (Rizzoli & Mullally, 2018). Evidence of trepanation, a common headache treatment, has been found in 9000-year-old Neolithic skulls (Rizzoli & Mullaly, 2018). Today, headaches continue to be the most common disorders of the nervous system. Although complaints of headaches have been around for centuries, they continue to be the most misdiagnosed and undertreated conditions globally (Rizzoli & Mullaly, 2018).

The Global Campaign against Headache led by Lifting the Burden (LTB), a nonprofit organization in the United Kingdom, was launched in 2003 to study and help alleviate the effects of headaches on populations worldwide (Saylor & Steiner, 2018). Along with the World Health Organization (WHO), LTB conducted studies in different parts of the world, including many underserved communities. The goal of LTB was to fill the knowledge gaps in headache management, help improve the process of accurately diagnosing headache disorders, improve provider efficiency, and increase cost-effectiveness and equitable headache management across all continents (Saylor & Steiner, 2018). The LTB study showed that the headache burden is

substantial, in terms of lost productivity, increased financial strain, and detrimental effects to the quality of life in all countries studied (Saylor & Steiner, 2018).

According to the Global Burden of Disease study (Saylor & Steiner, 2018), headache disorders are ranked second in years lived with disability. Approximately 50% of all adults aged 18 to 65 years experience at least one headache per year (WHO, 2016). The WHO ranks migraines among the top 20 most disabling conditions (National Headache Foundation, 2019). The number of people suffering from migraine headaches worldwide has been estimated to be approximately one billion (Rich, 2019). In the United States, approximately 25 to 45 million people suffer from migraines (National Headache Foundation, 2019). The high prevalence translates to a financial burden of 28 billion dollars per year in direct costs and 12 billion dollars in indirect costs with seven billion dollars in absenteeism and five billion dollars in decreased productivity (Rich, 2019). Headaches do not discriminate. They affect all age groups, genders, ethnicities, and financial backgrounds (WHO, 2016). Women are three times more likely to suffer from headaches than men, except for cluster headaches which affect men two times more than women (Rich, 2019).

Headaches are classified as either primary or secondary. Primary headaches are not caused by another condition and usually do not result in death (Rizzoli & Mullally, 2018). Over 90% of patients who seek care from their primary care providers for a headache complaint suffer from a primary headache (Rizzoli & Mullally, 2018). Migraine, tension-type headache, and cluster headache are the most prevalent types of primary headaches. (Rizzoli & Mullally, 2018). Secondary headaches are headaches that are caused by another underlying condition. Treatment of secondary headaches is dependent on managing the underlying cause (Steiner et al., 2019). The most common secondary headaches are caused by infection, vascular disease, or trauma

(Rizzoli & Mullally, 2018). Distinguishing between primary and secondary headaches is vital in determining the course of treatment. Accurately diagnosing types of headaches, recognizing red flag warnings, and providing cost-effective treatment can be achieved by primary care providers with the proper education (Saylor & Steiner, 2018).

Problem Description

According to data compiled by the Centers for Disease Control and Prevention and the Centers for Medicare & Medicaid Services, headache disorders are among the top 12 diagnoses that are billed in primary care (Rogers & Spain, 2020). Approximately five to nine million primary care visits in the United States are because of a diagnosis of migraine headache. Headache sufferers often seek care from their primary care providers for initial diagnosis and treatment (Minen et al., 2016). Despite headaches accounting for 10% of all primary care visits, they remain the most inaccurately diagnosed and undertreated conditions in outpatient clinical settings (Minen et al., 2016). The American Migraine Prevalence and Prevention (AMPP) study showed that primary care providers were hesitant to initiate headache treatments because of a lack of knowledge of evidence-based guidelines. This lack of knowledge has resulted in poor management of headache disorders by primary care providers (Minen et al., 2016). The AMPP study showed that primary care providers deferred to treatments that were not based on evidence because of the providers' personal beliefs that the recommended medication would be ineffective or because of the fear of the medications side effects (Minen et al., 2016). According to the LTB, primary care providers, with the proper training and education, can effectively diagnose and manage primary headache disorders (Saylor & Steiner, 2018).

A 10-day reflective practice was conducted at a military primary care, patient-centered medical home in September 2020. Evaluation of the results of the reflective practice showed that

headache disorders were a prevalent problem among patients aged 18 years or more who

presented to the clinic for care. A 90-day chart review conducted between October 2020 and

January 2021 showed that 83 patients were treated for a complaint of headache disorder. Of

those visits, 73.5 % had an *International Statistical Classification of Disease and Related Health*

Problems, 10th edition (*ICD-10*) code of *headache*, *unspecified*, *other*, or *other headache*

syndrome.

      ICD-10 codes are used among healthcare providers to standardize care. Coding for

specific *ICD-10* codes versus utilizing unspecified *ICD-10* codes helps to support a provider's

choice of treatment, standardizes diagnosis management, and provides better care continuity

(American Medical Association, 2016). In 2018, the Classification Committee of the

International Headache Society (IHS, 2018) published the third version of the "International

Classification of Headache Disorders" (ICHD-3). This classification system provides an

algorithmic method to define, classify, and diagnose all known headache disorders (IHS, 2018).

It has been translated into many languages and is utilized worldwide for diagnosing headaches

(IHS, 2018).

      In 2020, the United States Department of Veterans Affairs and the Department of

Defense (VA/DoD, 2020) developed a clinical practice guideline (CPG), utilizing the

classification criteria of the ICHD-3. The goal of CPGs is to synthesize and disseminate the best

evidence, increase quality care, and reduce inappropriate interventions (Ryan, 2017). The

VA/DoD (2020) CPG is intended to guide best practices using a patient-centered approach.

Available Knowledge

      A study was conducted to compare patient care outcomes using evidence-based practice

versus standard of care. The study showed that mortality rates dropped from 7.4% to 6.3 %, and

hospital length of stay dropped from 9.15 days to 6.01 days in patients treated by providers using evidence-based practice. According to Emparanza, Cabello, and Burls (2015) standardizing care through evidence-based practice has been shown to improve provider efficiency and improve patient outcomes.

The Headache Classification Committee of the IHS (2018) published the third edition of the International Classification of Headache Disorders (ICHD-3) in the journal *Cephalgia* in 2018. The ICHD-3 is a classification system for headache disorders and is based on specific diagnostic criteria. Consisting mainly of expert opinion when first published over 30 years ago, it has evolved into one of the best evidence-based headache classification systems available in neurology today. It has been translated into many languages. It is currently utilized in research projects, drug trials, studies in pathophysiology and biochemistry, and CPGs (IHS, 2018). However, although evidence-based practice has been shown to improve patient outcomes, it is not easily incorporated into clinical practice.

CPGs are systemically reviewed and synthesized into recommendations. CPGs help to disseminate the best available scientific evidence into clinical practice (Ryan, 2017). In 2020, the Primary Care Management of Headache Work Group published the VA/DoD *Clinical Practice Guideline for the Primary Care Management of Headache*. This clinical guideline was developed from the systematic review of several randomized controlled trials and other systematic reviews published between January 1, 2009, and March 6, 2019. A total of 140 studies that answered vital questions (i.e., about population, intervention, comparison, outcome, timing, setting) were included. The guideline was designed to be patient centered, and the involvement of multidisciplinary stakeholders added to its strength.

The VA/DoD also developed an algorithm to facilitate the use of the CPG with a reference card. This evidence-based reference card is an abbreviated version of the VA/DoD CPG. It is composed of the CPG algorithm with a quick reference flowchart. Easy-to-read sidebars contain the CPG diagnostic headache criteria and evidence-based treatment recommendations for specific headache disorders. This pocket card provides quick access to accurate, up-to-date, and relevant information when treating patients with headache disorders. The use of the VA/DoD evidence-based algorithm facilitates decision-making. It fosters clinic providers' adherence to CPG use (The Primary Care Management of Headache Work Group, 2020).

Rationale

The *Cambridge Dictionary* (2021) defines tacit knowledge as the knowledge that is acquired from personal experience. Evidence-based knowledge is the knowledge obtained from scientific research (White, Dudley-Brown, & Terhaar, 2021). Transitioning from implicit learning to evidence-based practice can be challenging. An organization can successfully transition from implied knowledge to explicit evidence-based practice by utilizing the best research evidence, clinical expertise, and patient preferences. Transitioning to evidence-based practice can be assisted using frameworks and models to guide the process (White et al., 2021).

The John Hopkins Nursing Evidence Based Practice (JHNEBP) model is a conceptual model that incorporates nursing practice, education, and research into its paradigm. It merges scientific research with implicit knowledge, taking into account internal and external factors that affect clinical practice while supporting critical thinking (White et al., 2021). The JHNEBP model consists of three phases: practice question, evidence, and translation (John Hopkins University School of Nursing, 2017; Figure 1).
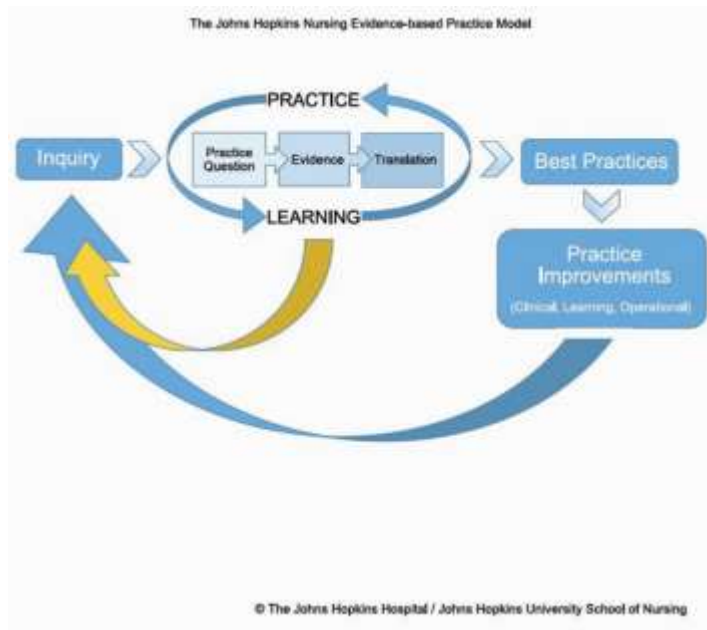
Figure 1. John Hopkins Evidence-based Practice Model, a problem-solving approach to clinical decision-making through a three-step process called PET, which represents practice question, evidence, and translation (John Hopkins Medicine, 2017).

The practice question is answered through a six-step process. The process consists of identifying the team, defining the problem, developing and defining the evidence-based practice question using the PICOT (i.e., population, intervention, comparison, outcome, and time) format, identifying stakeholders, determining project leadership, and scheduling team meetings. In the evidence phase, the principal investigator seeks to find the best evidence through a process of five steps which include conducting an internal and external evidence search, appraising the level of evidence, summarizing the evidence, synthesizing the evidence, and developing recommendations for change. In translation, the evidence is translated into practice through an eight-step process. The process includes determining the feasibility of translation, creating an action plan, securing project support, implementing the plan, evaluating the outcome, reporting the results to stakeholders, identifying the next step, and disseminating the findings (White et al., 2021).

The JHNEBP model was used for this quality improvement project (QI) project. The following PICOT components were utilized to determine the evidence-based practice question:

P: Military dependents and retirees aged at least 18 years, seeking treatment for headache disorders at a military primary care clinic.

I: Utilization of the VA/DoD CPG algorithm to diagnose and manage headache disorders in primary care.

C: A comparison of current clinical practice of evaluating, diagnosing, and managing headache disorders dependent on providers' personal preference versus evidence-based practice

O: Clinic providers' standardization of the management of headache disorders

T: 30 days

During the practice question phase, the DNP student recruited the team and identified the stakeholders. The team consisted of five nurse practitioners, one physician, two management members, two licensed vocational nurses, and a registered nurse. The problem identified was that the current clinical practice regarding evaluation, diagnosis, and managed treatment of headache disorders varies from clinician to clinician, with no standardized approach currently in place. The QI project was also designated an Army Department of Primary Care (DPC) performance improvement (PI) project; the stakeholders were primary care providers assigned to the DPC. An in-service project training was held with the providers 1 week before the project was implemented. A second meeting was held 2 weeks after the project was implemented to update team members on the current progress and to address any questions or concerns. A third meeting was held 1 week after project completion to discuss the project outcomes.

During the evidence phase, the DNP student conducted a review of the literature. Included in the literature review was the VA/DoD CPG, which was developed from several randomized controlled trials and other systematic reviews and was designed with contributions from a multidisciplinary team, which added to its strength. Also included was a study that showed improved patient outcomes through the use of evidence-based practice versus standard practice.

The translation phase involved the assessment of project feasibility. The DNP student reviewed future scheduled headache appointments to determine whether inclusion criteria were met. The DNP student reviewed data collection methods to ensure *ICD-10* headache codes would be accessible in a timely manner. The DNP student determined that the use of the CPG would not adversely affect provider appointment times.

QI is a systematic process of evaluating an organizations performance and seeking ways to continuously improve that performance (American Academy of Family Physicians (AAFP), 2021). The benefits of implementing QI into an organization are evident in an organization's improved efficiency, improved patient safety, and improved clinical outcomes (AAFP, 2021). Implementing QI into an organization can be facilitated through the use of QI models.

The QI model used for this DNP QI project was the PDSA (i.e., plan, do, study, act) model. The PDSA cycle consists of 4 steps: plan, do, study, and act (Institute for Healthcare Improvement IHI, 2021). It is widely used in healthcare because it can be implemented on a small scale in a real work setting, and it supports ongoing adjustment and continuous improvement (White et al., 2021).

For this project, the *plan* phase consisted of becoming familiar with the VA/DoD headache CPG algorithm, determining how to introduce the CPG to the clinic providers,

determining how to establish a baseline to measure current practice, and determining how to measure the success of the CPG use after implementation. The *do* phase consisted of providing an in-service training on the use of the CPG algorithm. Each provider was given a printed and laminated copy of the CPG algorithm for quick reference. The *study* phase consisted of evaluating provider adherence to CPG algorithm use 2 weeks after implementing the project. Compliance was measured by assessing unspecified *ICD-10* headache codes at baseline and 2 weeks postimplementation. The *act* phase consisted of providing a second in-service training with additional, more in-depth education provided.

Specific Aims

This QI project aimed to adapt and implement the evidence-based VA/DoD CPG algorithm to improve the treatment and management of patients aged at least 18 years who present with headaches. The aim was to standardize care using evidence-based practice tools to improve patient outcomes and improve provider efficiency. The objective was to assist primary care providers in assessing, treating, and following up care of headache sufferers by providing evidence-based management pathways. The expected outcome was to standardize among clinic providers the care of headache disorders.

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Methods

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Context

This QI project was conducted at a military primary care, patient-centered medical home. The clinic follows the Community Based Medical Home model, an Army-run primary care clinic located off-post for Army families residing in the community (Army Medicine, n.d). The model is patient centered, with a team of healthcare professionals dedicated to providing the highest quality, comprehensive medical care to all of its patients. The patient population at the clinic

consists of military dependents and retirees with the youngest patient being aged at least 1

month. Currently, five nurse practitioners and one physician are assigned to the clinic. Each

provider has a patient empanelment of approximately 1100 patients. Two licensed vocational

nurses are appointed to each provider to assist with all aspects of patient care. Five registered

nurses work at the clinic. Two of them serve as case managers, two serve as patient care access

nurses, and one is assigned to oversee quality assurance and *Healthcare Effective Data and*

Information Set (HEDIS) measures. The two front desk personnel are licensed vocational nurses,

allowing quality service upon initial clinic contact. A behavioral health professional is also

available to assist patients with behavioral health needs. The clinic has a pharmacy and

laboratory, but COVID-19 has caused these ancillary services to close temporarily. Clinic

management consists of a group practice manager and a supervisory health system specialist.

Intervention

Before designing the intervention, the DNP student conducted a literature review utilizing

the databases CINAHL, PUBMED, EBSCO, and Google Scholar. The search was limited to

publications linked to full articles, articles written in English, and articles published between

2013 and 2020. The search terms utilized were headaches*,* management*,* treatment, and

intervention*.* The initial search yielded 1360 articles; additional search terms were used, such as

adults, primary care, and clinical practice guidelines to narrow the search further. A total of 12

publications were located. The relevant articles were described in the Available Knowledge

section.

The intervention consisted of implementing an evidence-based practice CPG algorithm

for patients aged at least 18 years with headache disorder at a military primary care, patient-

centered medical home. The algorithm utilized for this project consisted of an easy-to-follow

flowchart to facilitate its use in clinical practice. A pre-post project design was used for this QI

project. In the pre-intervention phase, a retrospective chart review was conducted from October

2020 to January 2021 to identify the current practice for diagnosing headache disorders. The

project planning began on January 25, 2021, with project implementation following a determined

timeline (Table 1).

The DNP student conducted an in-service training for the six clinic providers via

Microsoft Teams 1 week before the implementation of the project. At the in-service training, the

providers were given a laminated copy of the CPG algorithm (Appendix) and were instructed on

its use. They were also provided with a website that contained the complete CPG for further

reference. The baseline data regarding the current *ICD-10* headache coding practices were

presented (Figure 2). The providers were educated on using the CPG management pathways to

ensure the proper intervention was initiated based on the specific headache diagnosis given, as

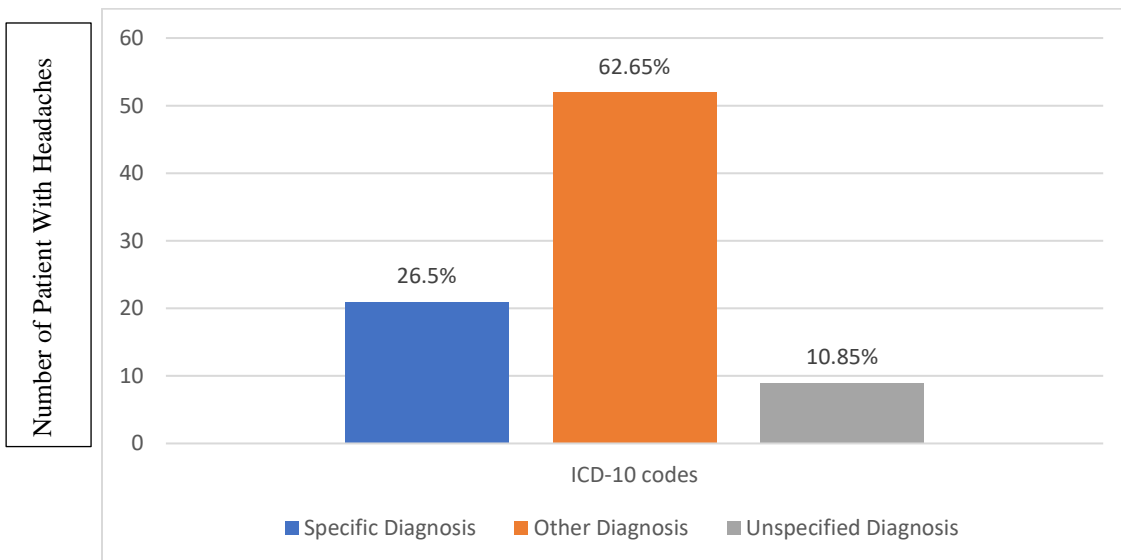evidenced by the use of specific *ICD-10* headache codes.

Figure 2. 90-day chart review of headache diagnosis October 2020 through January 2021, pre-intervention. The *ICD-10* codes represented the unspecified, other, or specific headache diagnoses.

Over 4 weeks, the providers applied the intervention to patients who met the inclusion criteria. Patients aged at least 18 years with a complaint of headache were included. Due to COVID-19 restrictions, many of the healthcare visits were conducted over the telephone. These telehealth visits were all 20 minutes in length. A few patients were brought into the clinic if the provider deemed a face-to-face visit was necessary for further evaluation. These face-to-face visits varied from 20 to 40 minutes in length.

The DNP student conducted a chart review 2 weeks postimplementation to assess the adherence to the CPG. A need for further education was determined based on the continued usage of unspecified *ICD-10* headache codes by three providers, so a second in-service was conducted, which was conducted in person. During the in-service training, the providers were given additional printed educational materials in an easy-to-access binder. The educational material included an abbreviated CPG provider summary with more in-depth information on CPG use. They were also provided with short descriptions of the most common types of primary and secondary headaches. A third retrospective chart review was conducted 1 week after project completion.

Table 1

Project Timeline

Activity	Date
Identify stakeholders	January 25, 2021
Determine project leadership	January 25, 2021

Identify inclusion and exclusion criteria
 	
Inclusion criteria:
    • Patients aged 18 years or more with complaint of headache
Exclusion criteria
    • Patients aged less than 18 years
    • Patients who are pregnant
	January 26, 2021

Schedule team meetings	January 27, 2021
Conduct in-service for providers on use of CPG, provide printed educational material and laminated CPG algorithm pocket card	February 3, 2021
Implement the CPG algorithm for patients meeting criteria	February 8, 2021
Chart review 2 weeks after implementation to assess progress	February 22, 2021
Second in-service training, provide additional education on CPG use	February 24, 2021
Complete project	March 8, 2021
Retrospective chart review to assess adherence to CPG usage by providers	March 15, 2021
Report outcome to team members	March 19, 2021
Report outcome to stakeholders & PI Committee	April 14, 2021

Note. CPG = clinical practice guideline; PI = performance improvement.

Measures

CPG adherence was measured in terms of *ICD-10* codes used for headache diagnosis.

Data was obtained from the Armed Forces Health Longitudinal Technology Application

(AHLTA) electronic medical record. A total of six out of six clinic providers completed the

project. All providers' charts with a headache diagnosis reviewed between February 8, 2021 and

March 8, 2021 that met inclusion criteria were included in the data.

Analysis

Frequency and distribution charts were created to identify the *ICD-10* codes being utilized by each provider. *ICD-10* codes were categorized into u*nspecified*, *other*, and *specific* headache diagnoses. CPG adherence was evaluated based on the number of *ICD-10* codes in each category. CPG adherence was evident in AHLTA records coded for specific headache diagnoses.

Ethical Considerations

Two institutional review boards reviewed this QI project. It was reviewed by the William Beaumont Army Medical Center Human Research Protections Program Office and The University of Texas at El Paso Institutional Review Board. Both reviewing boards determined the project was not research and they granted approval for implementation.

The project was also designated a Department of Primary Care PI project. It underwent a review by the William Beaumont Army Medical Center PI Committee before being granted approval by the deputy commander. Patient data were accessed using a password-protected government computer. All data collected were de-identified, and any hard copies of data analyzed were disposed of appropriately. This project did not recruit any patients, nor were any patients harmed during the project.

The DNP student obtained a Certificate of Added Qualification in Headache Medicine (AQH) through the National Headache Foundation in preparation for this QI project. The AQH identifies healthcare providers with an advanced level of experience in headache medicine. The DNP student was also designated a pain champion at the military primary care, patient-centered medical home where the QI project was conducted.

Results

Three of the six providers had a decrease in unspecified *ICD-10* headache diagnosis use. CPG adherence was evaluated by conducting a retrospective chart review 2 weeks postimplementation and at 4 weeks postimplementation. An increase in coding for specified headache diagnosis was evident at 2 weeks postimplementation, and continued progress was evident at 4 weeks. The providers had a more positive response to the second in-person in-service training. They appeared to be more engaged, asked more questions, and appeared to have a better understanding of the utilization of the CPG. The DNP student presented the results to the clinic team, with findings disseminated to stakeholders and to the PI Committee. The results can be found in Table 2.

Table 2

Headache Diagnoses by Provider 2 Weeks Postimplementation

Headache Diagnosis	Provider 1	Provider 2	Provider 3	Provider 4	Provider 5	Provider 6
Chronic migraine without aura, not intractable, without status migrainosus			8	1		
Chronic tension-type headache, not intractable		1				
Episodic tension-type headache, not intractable	2					
Headache with orthostatic component, not elsewhere classified						1
Headache, unspecified		1		1		1
Menstrual migraine, not intractable, without status migrainosus			1			
Migraine with aura, not intractable, without status migrainosus	3				2	1
Migraine, without aura, intractable, without status migrainosus			1			
Migraine without aura, not intractable, without status migrainosus				2		
Migraine, unspecified, not retractable, with status migrainosus				1		
Other headache syndrome		2				
Other migraine, intractable with status migrainosus						1
Other migraine, intractable, without status migrainosus						2
Other migraine, not intractable, without status migrainosus						3
Other migraine, not intractable		4		1		
Tension-type headache, not intractable	5	3		2		

At 2 weeks, the results demonstrated that 50 % of the providers were coding for specific

headache diagnoses. The other 50 % continued to code for unspecified or other headache
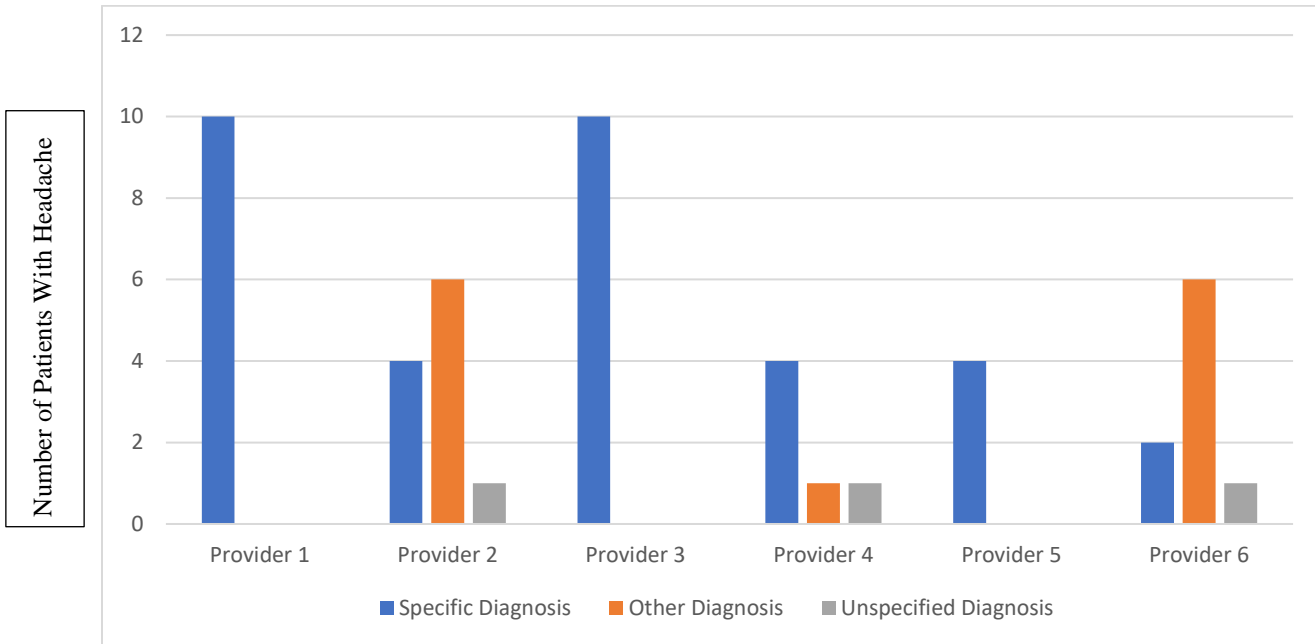
diagnoses (Figure 3).

Figure 3. ICD-10 coding for headache diagnoses at 2 weeks postimplementation.

At 4 weeks postimplementation, an improvement was seen in the coding for specific

diagnoses (Table 3); however, coding for unspecified and other headache diagnoses did continue

(Figure 4).

Table 3

Headache Diagnoses by Provider at 4 Weeks Postimplementation

Headache Diagnosis	Provider 1	Provider 2	Provider 3	Provider 4	Provider 5	Provider 6
Chronic migraine without aura, intractable, without status migrainosus			1			
Chronic migraine without aura, not intractable, without status migrainosus			2			1
Chronic tension-type headache, not intractable			1			
Episodic tension-type headache, not intractable						
Headache, unspecified		1	1	1		
Menstrual migraine, not intractable, without status migrainosus						
Migraine with aura, not intractable, without status migrainosus	4		1			
Migraine, without aura, intractable, without status migrainosus				1	3	1
Migraine without aura, not intractable, without status migrainosus	2					
Migraine, unspecified, not retractable, with status migrainosus						
Other headache syndrome						
Other migraine, intractable with status migrainosus						
Other migraine, intractable, without status migrainosus						
Other migraine, not intractable, without status migrainosus					1	
Other migraine, not intractable						
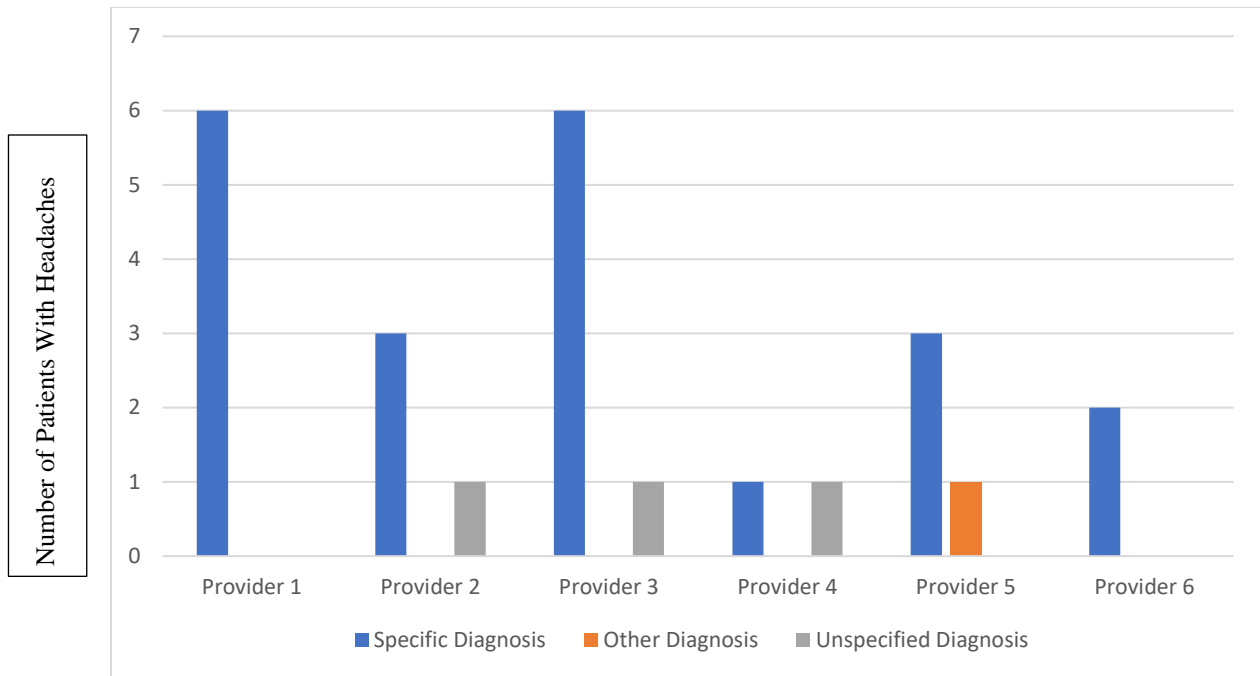
Figure 4. ICD-10 coding for headache diagnoses at 4 weeks postimplementation.

The final results showed improvement in diagnosing specific headache types compared to

the diagnosing patterns demonstrated in the initial chart review before project implementation
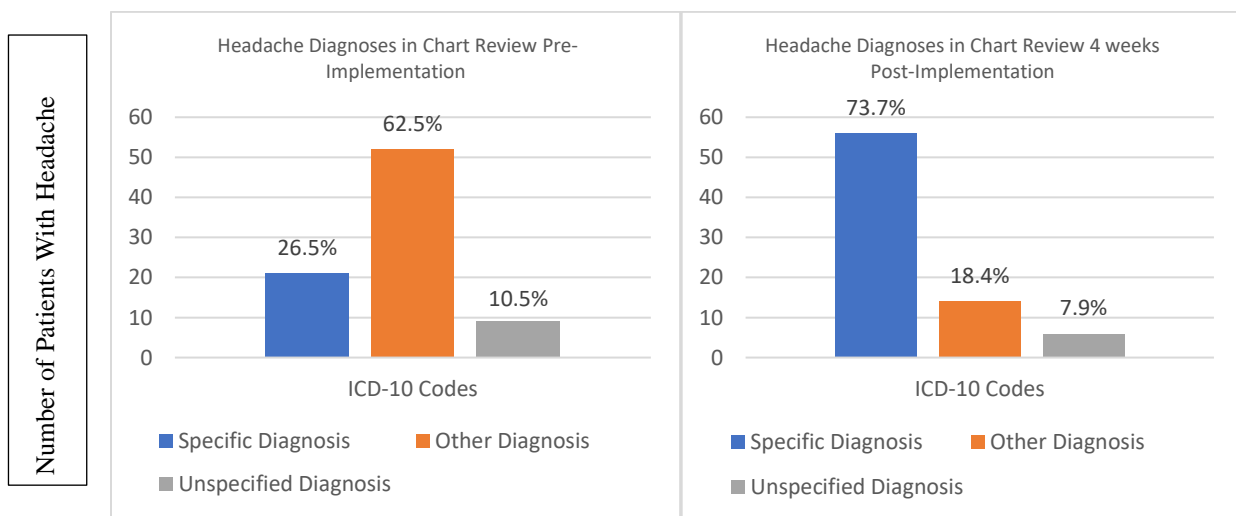
(Figure 5).

Figure 5. A comparison of coding practices using *ICD-10* codes pre-implementation and postimplementation of clinical practice guidelines.

Discussion

Summary

The results of this QI project demonstrated an overall improvement in the diagnosis of headache disorders at a military primary care, patient-centered medical home. Implementation of the easy-to-follow VA/DoD CPG algorithm facilitated decision-making, which helped foster clinic providers' adherence to the CPG. According to Ryan (2017), CPGs are a quick and effective way to disseminate the best available scientific evidence into clinical practice.

Interpretation

This QI project was designated as a PI project for the Department of Primary Care. Ongoing evaluation of its use will continue for an additional 11 months. The goal is to successfully implement the CPG in all military primary care clinics in the Southwest. According to the Institute of Medicine, CPGs are designed to facilitate the use of best evidence-based treatments for certain healthcare conditions (Kredo et al., 2016). They are intended to improve the quality of care, decrease adverse events, improve efficiency, and standardize care in clinical practice (Kredo et al., 2016). The use of the PDSA model lends to the project's strength. The PDSA model will allow for continuous evaluation of the project as well as real time changes.

Implementation of the VA/DoD CPG did not disrupt current clinic routines. Its use did not cause clinic providers to extend past their allotted 20-minute appointment time frame. All clinic providers generally accepted the CPG. However, it is foreseeable that ongoing education in the form of in-person in-services trainings will be required for sustainability, as some providers continued to code for nonspecific headache diagnoses.

Limitations

This project was conducted during the COVID-19 pandemic. As a result, many clinic visits were performed remotely either on the telephone or via video chat. According to Rizzoli and Mullally (2018), a detailed health history is required for adequately diagnosing a headache disorder; while a good subjective interview can be conducted over the telephone, a good neurological examination cannot. Clinic providers were often limited to subjective data when formulating some of their headache diagnoses.

Another limitation was the lack of a specific diagnosis code for COVID-19 headache. This type of headache has been described by patients who have tested positive for COVID-19. The *ICD-10* code for this specific secondary headache has not been created, and providers were left with the option of coding for a "headache, unspecified" when presented with this complaint.

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Conclusions

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Headache disorders are a global problem that has affected people for centuries. The financial, social, and physical burden caused by headaches is substantial. Primary care providers can positively impact the quality of life of headache patients by accurately diagnosing and providing appropriate, timely care; however, they may be reluctant to provide recommended headache treatment due to a lack of knowledge. CPGs are an effective way to educate providers on evidence-based headache medicine and to translate this knowledge into clinical practice.

Appendix

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THE UNIVERSITY OF TEXAS AT EL PASO

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DNP SYMPOSIUM

Disclaimer

The views expressed in this presentation are those of the author and do not reflect the official policy or position of William Beaumont Army Medical Center, Department of the Army, Defense Health Agency, or the US Government

Implementing an Algorithm for Headache Management in a Patient Centered Medical Home

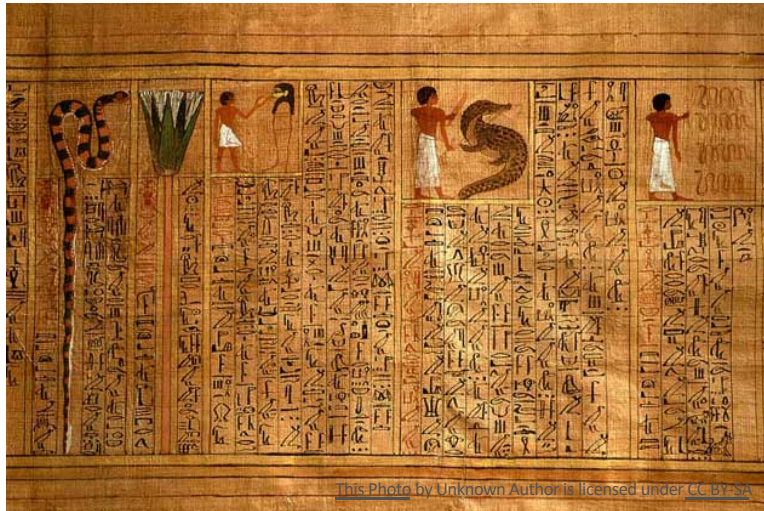Michelle L. Calderon MSN, APRN, FNP-C, AQH

The University of Texas at El Paso

DNP Program

May 12, 2021

"A great wind is blowing and that gives you either imagination or a headache"

Catherine the Great

Introduction

- 1200 B.C. – The Ebers Papyrus
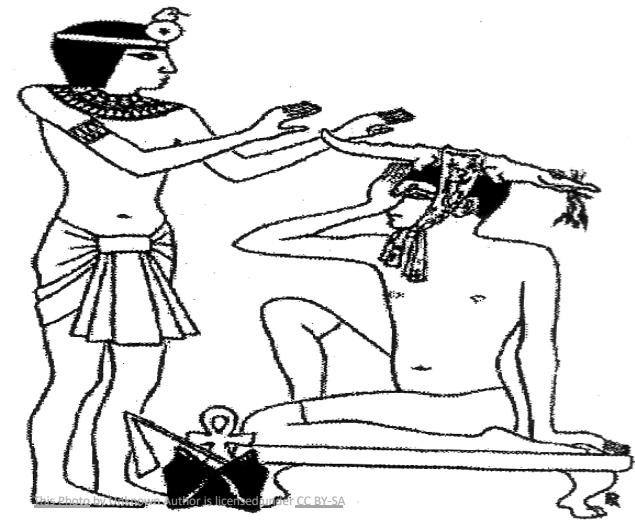
(Popkop, 2018)

Introduction

- 400 A.D.

Hippocrates

- 200 A.D.

Aretaeus of Cappadocia

(Popkop, 2018)

Introduction

- Trepanation
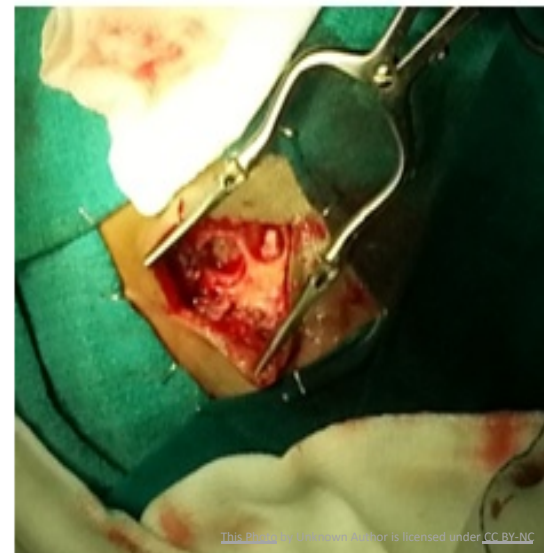
(Rizzoli & Mullaly, 2018)

Introduction

❖ Lifting the Burden
  ➢ The Global Campaign Against Headache
  ➢ 2003

❖ World Health Organization (WHO)
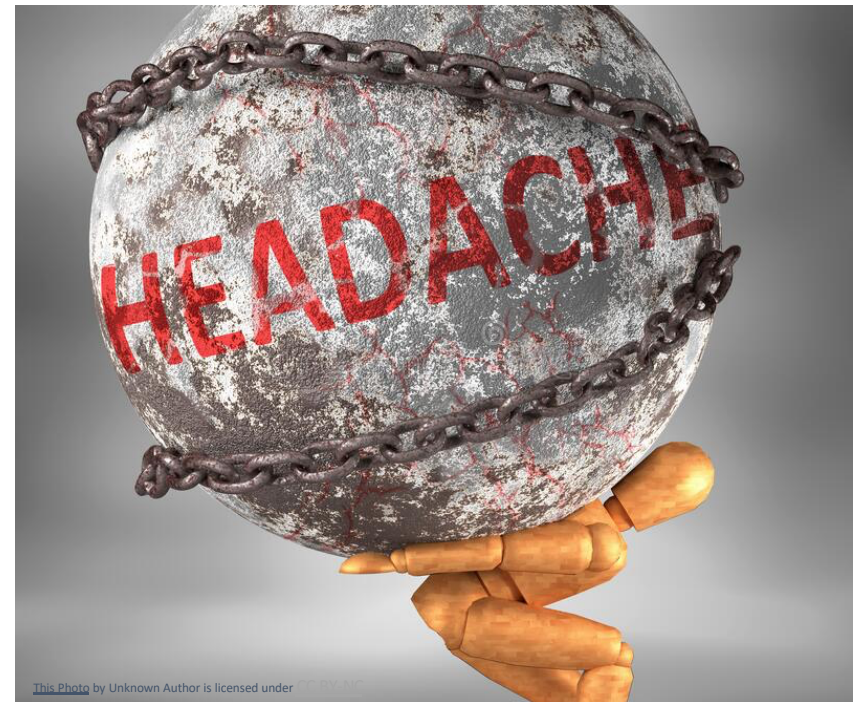
This Photo by Unknown Author is licensed under

(Saylor & Steiner , 2018)

Background

- Incidence

- Cost

- Prevalence

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((Rich, 2019), (Rizzoli & Mullally, 2018), (World Health Organization (WHO), 2016)

Description of Problem

- Classification

- Misdiagnosed and undertreated

- Top 12 most billed diagnoses

- 10% of primary care visits

- Lack of knowledge
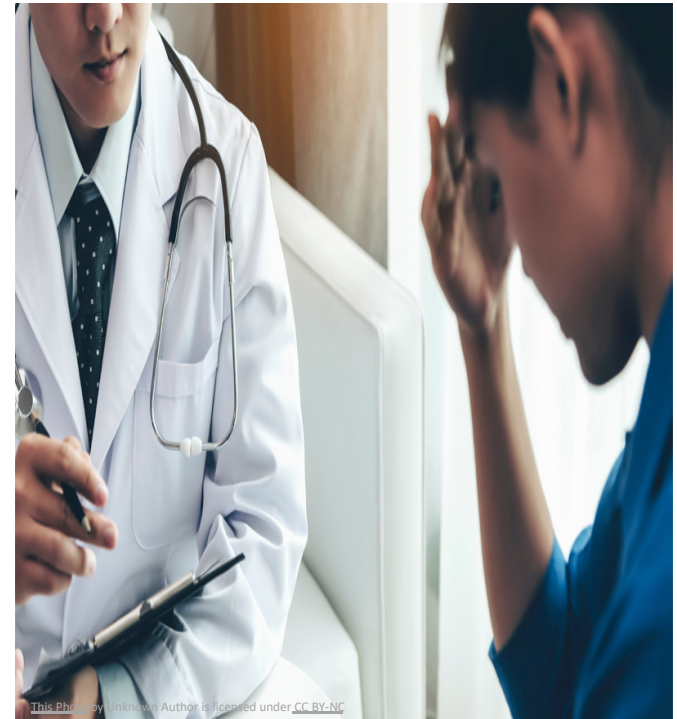
(Minen et al., 2016), (Rogers & Spain, 2020), (Saylor & Steiner, 2018)

Literature Review

- Databases

- Search criteria

- Search results

Literature Review

1. Emparanza, J.I., Cabello, J.B., & Burls, A.J.E. (2015) Does evidenced-based practice improve patient outcomes? An analysis of a natural experiment in a Spanish hospital. *Journal of Evaluation in Clinical Practice, 21,* 1059-1065

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Framework

The Johns Hopkins Nursing Evidence-based Practice Model

© The Johns Hopkins Hospital / Johns Hopkins University School of Nursing
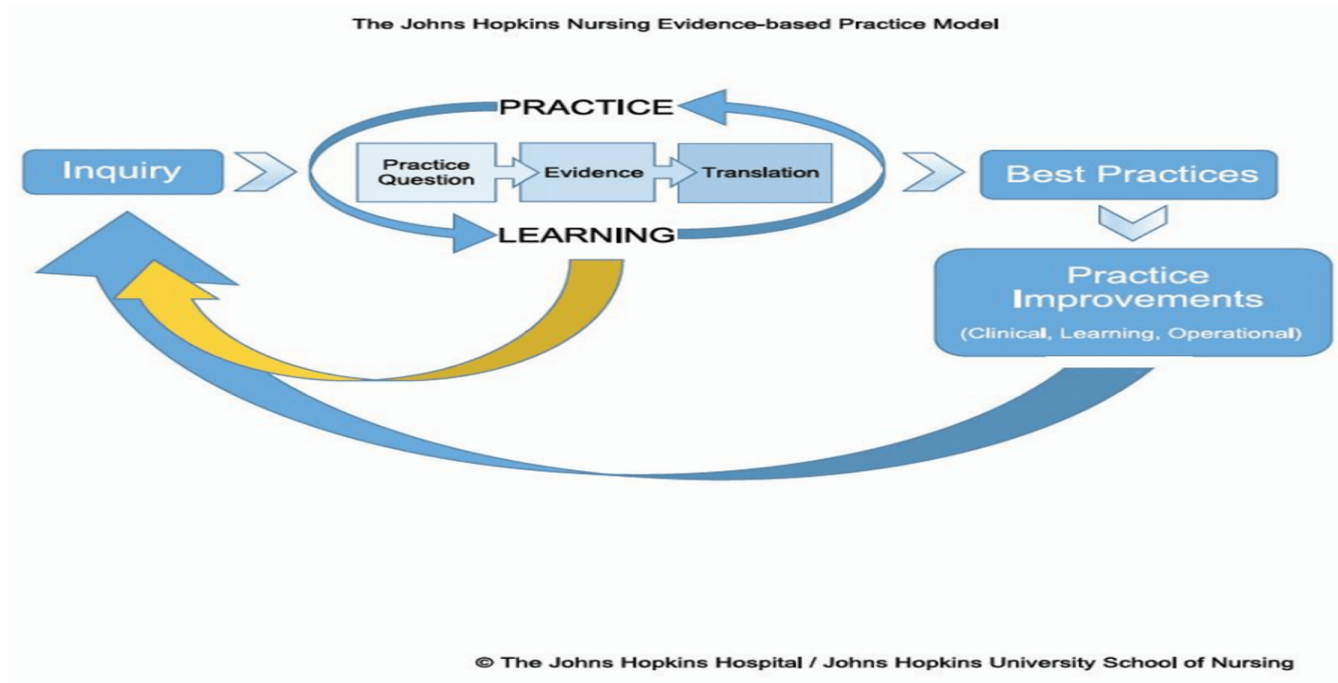
(John Hopkins Medicine, 2017)

PICOT

P: Military dependents and retirees aged at least 18 years old, seeking treatment for headache disorders at a military primary care clinic.
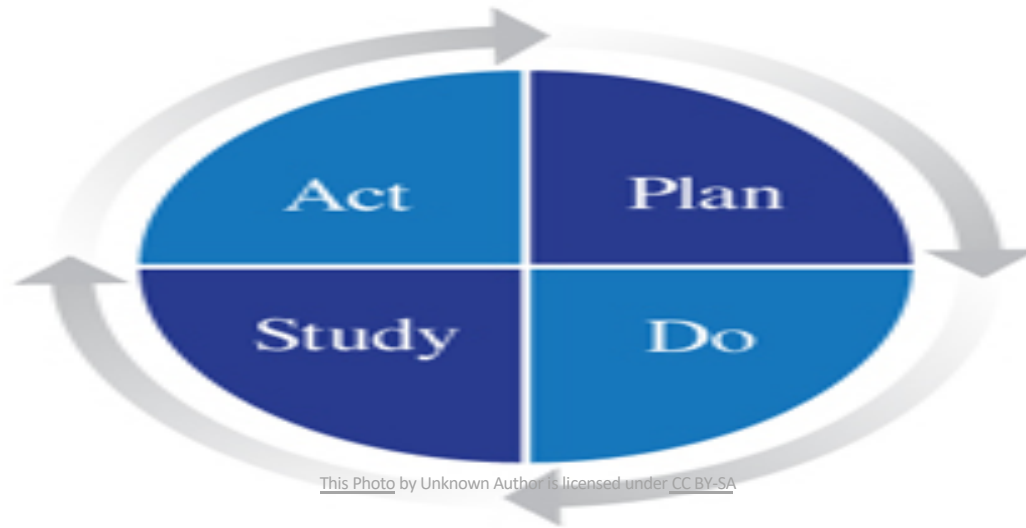
I: Utilization of the VA/DoD CPG algorithm to diagnose and manage headache disorders in primary care.

C: Current clinical practice of managing headache disorders dependent on providers' personal preference versus evidence-based practice

O: Standardization of the management of headache disorders

T: 30 days

Quality Improvement Model

This Photo by Unknown Author is licensed under CC BY-SA

Ethical Considerations

- William Beaumont Army Medical Center Human Research Protections Program Office
  - ✓ Performance Improvement Committee

- The University of Texas at El Paso Institutional Review Board

I R B

Certification

Certificate of Added
Qualification in
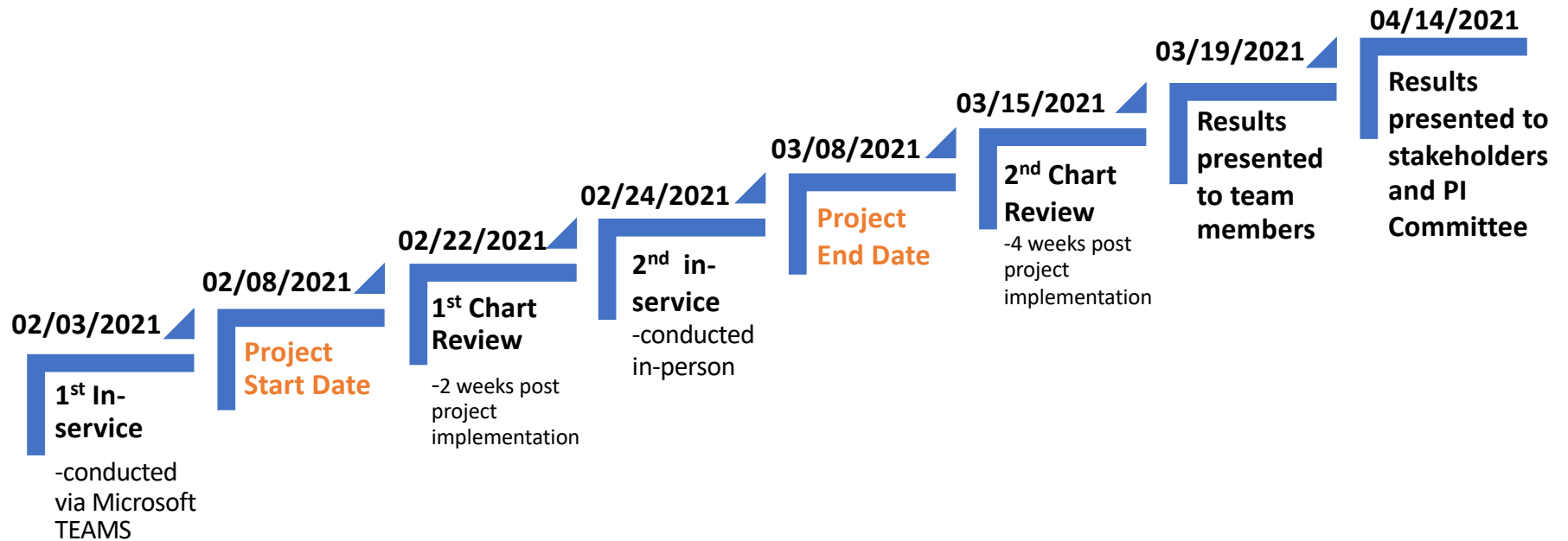Headache Medicine
(AQH)

(National Headache Foundation, 2021)

Methods

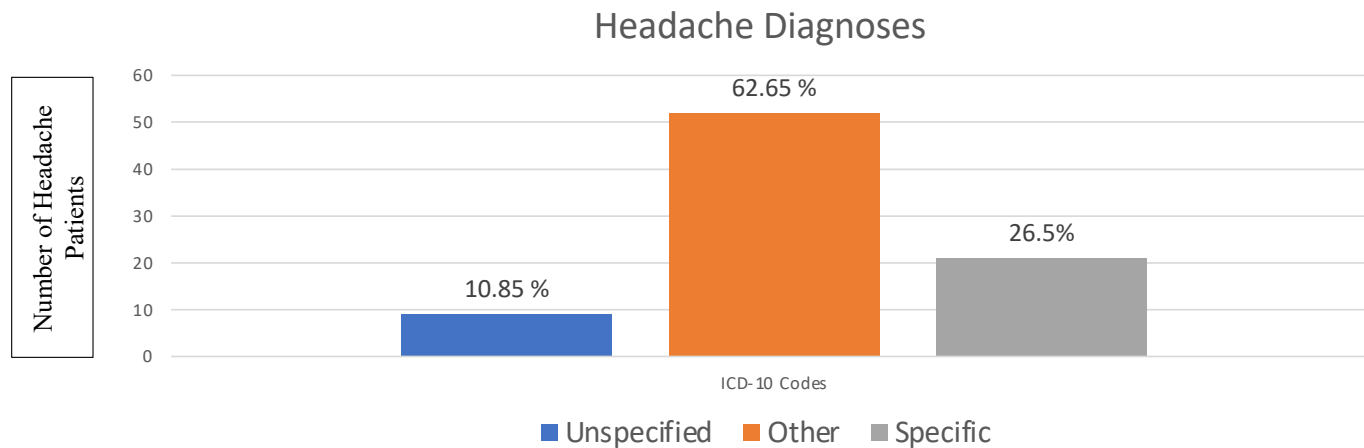- Clinical setting

- Clinical staff

- Patient population

ARMY MEDICINE
Bringing Value...Inspiring Trust
SINCE 1775

UTEP

PROJECT TIMELINE

02/03/2021

1st In-service

-conducted via Microsoft TEAMS

02/08/2021

Project Start Date

02/22/2021

1st Chart Review

-2 weeks post project implementation

02/24/2021

2nd in-service

-conducted in-person

03/08/2021

Project End Date

03/15/2021

2nd Chart Review

-4 weeks post project implementation

03/19/2021

Results presented to team members

04/14/2021

Results presented to stakeholders and PI Committee

UTEP

Project Design

- Pre/Post Design
- 90 day chart review (Oct 2020 – Jan 2021)

Headache Diagnoses

Intervention

- In-service 1 week prior

- Microsoft TEAMS

- Establish baseline, determine goals
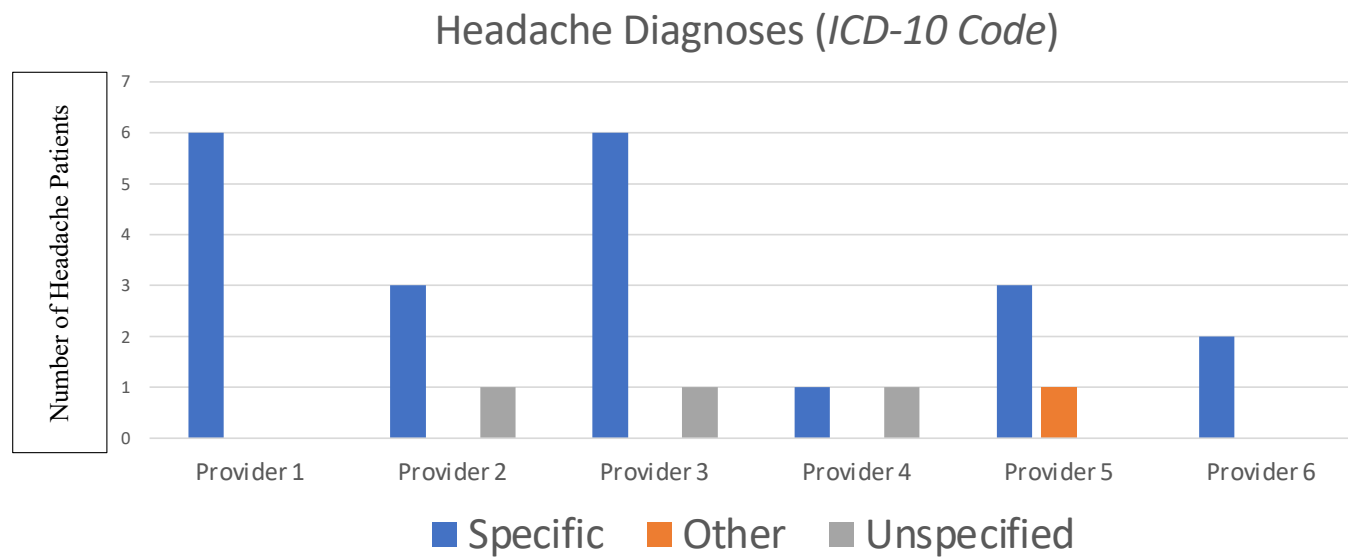
- Educate on CPG use

- Provide laminated copy of CPG
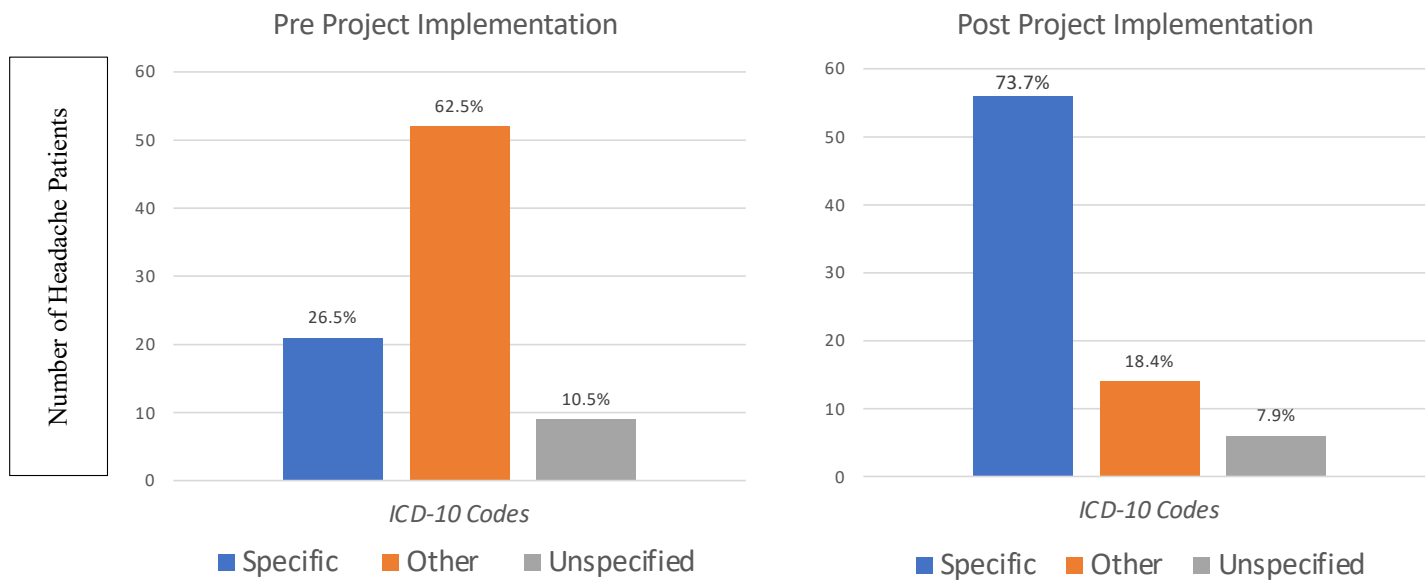
Results

2 weeks post implementation

Headache Diagnoses (*ICD-10 code*)
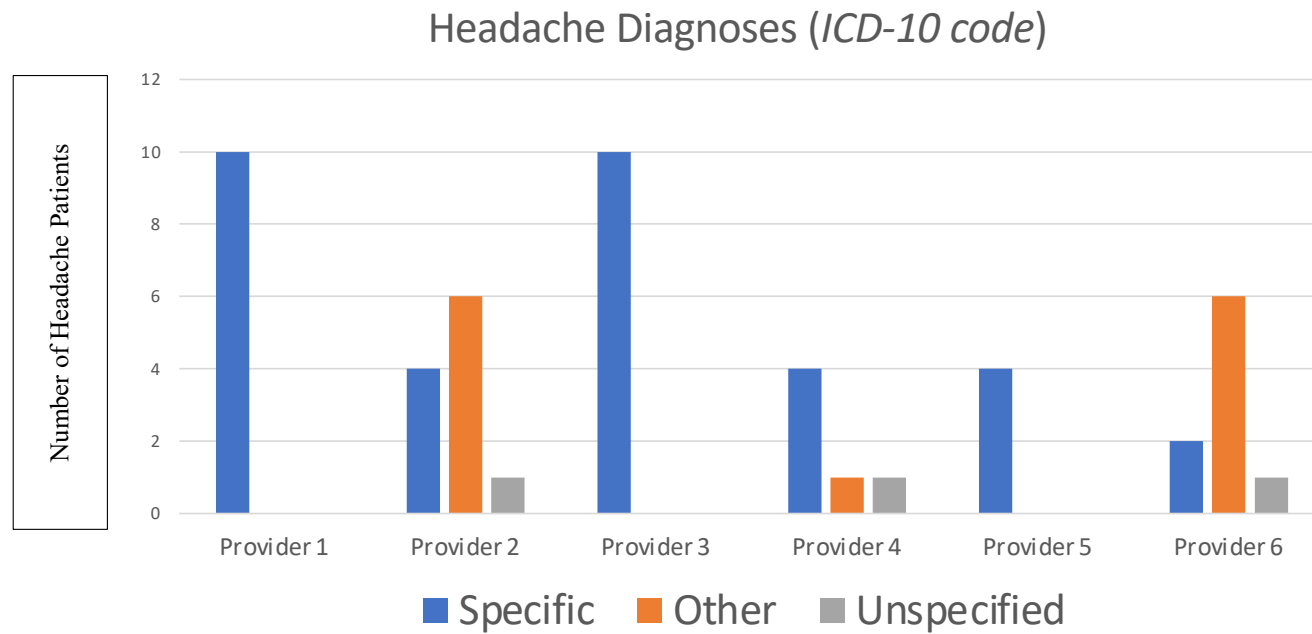
Results

4 weeks post implementation

Headache Diagnoses (*ICD-10 Code*)

Results

Pre/Post implementation

Headache Diagnoses

Pre Project Implementation

Post Project Implementation

Patient Outcomes

Patient 1

- Tension Headache
- Decrease in headache days (10 days vs 20 days)

Patient 2

- Menstrual Migraine
- Decrease in headache days (1 day vs 7 days)

Discussion

- Limitations

- Strengths

- Implications for practice

Conclusion

- Standardized care

- Provider efficiency

- Cost effective

- Patient outcomes

Questions?

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Steiner, T.J., Stover, L.J., Jensen, R., Uluduz, D., & Katsarava, S. (2020). Migraine remains the second among the world's causes of disability, and first among young women: findings from GBD2019. The Journal of Headache and Pain, 21(137). doi:10.1186/s10194-020-01208-0

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Implementing an Algorithm for Headache Management in a Patient Centered Medical Home

Michelle L. Calderon MSN, APRN, FNP-C, AQH

Introduction

Background

The Headache Burden

- Documentation of headache disorders found as early as 1200 B.C

- Affects 1.04 billion people globally with 25 to 45 million in the United States

- Annual financial burden of $28 billion in direct costs; $12 billion in indirect costs

- In primary care, among the top 12 billed diagnoses, and most misdiagnosed and under treated condition

- No standardized practice currently exists for diagnosing and treating headache disorders at the Rio Bravo Patient Centered Medical Home

The Search

After completing a 10-Day Reflective Practice Log (RPL). I reviewed my practice patterns. After completing a Review of Patients (ROP). I discovered more patients complained of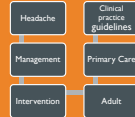 headaches. At that time, my practice intervention was _____ _____. As one of my PICOT questions I was inquisitive about what else could be done with headaches at my practice place.

Project Aim

Implement the use of an EBP CPG to standardize care, improve efficiency, and improve patient outcomes.

Methods

Literature Review

- Institutional IRB and PI Committee approval
- 90 day chart review (Oct2020-Jan2021) to establish current clinical practice for headache diagnosis (*ICD-10 codes*)
- 1st in-service conduced via Microsoft TEAMS. Six primary care providers instructed on CPG use with laminated copy of CPG provided (Module A).
- Chart review conducted 2 weeks post CPG implementation
- 2nd in-service conducted in-person. Providers re-educated on CPG use, with additional educational material provided
- Chart review conducted 4 week post CPG implementation to evaluate adherence to CPG use

VA/DoD Clinical Practice Guideline Algorithm

Scan for full algorithm
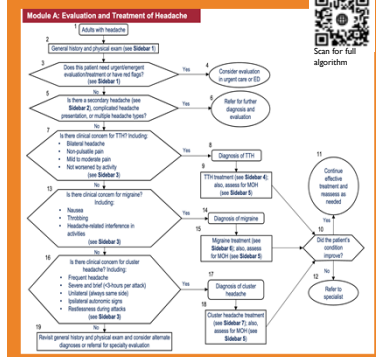
Results

CPG adherence evaluated based on provider use of specific headache diagnoses vs unspecified headache diagnoses

2 weeks post CPG use

4 weeks post CPG use

Pre & Post CPG implementation
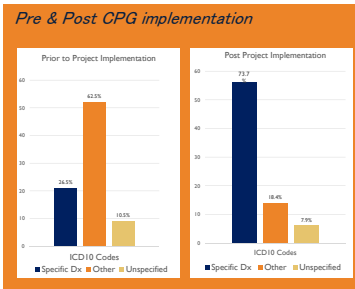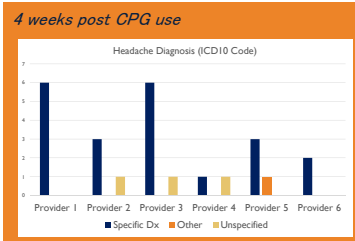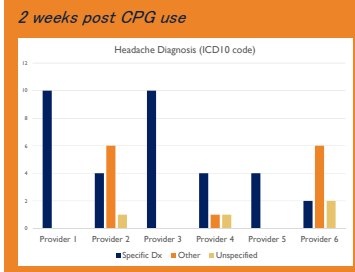
Discussion

Challenges
- Conducted during COVID-19 pandemic, appointments limited to virtual telehealth visits
- Providers continued to use unspecified diagnosis

Strengths
- CPG is easy to follow, facilitates decision making
- CPG use did not extend appointment time over allotted 20 min
- Designated as a PI Project

Implications for practice
- Overall improvement in specific headache diagnosis after CPG implementation.
- Sustainable but will require ongoing education

Conclusion

Easing the Headache Burden

- Headaches cause a substantial burden physically, financially, and socially.
- Primary care providers can help lessen the burden through accurate diagnosis, appropriate treatment, and timely care,
- Clinical practice guidelines are an effective way to educate primary care providers on evidence-based recommendations and help translate those recommendations into clinical practice.

References av:

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