

AMERICAN UNIVERSITY OF BEIRUT

CLINICAL GUIDELINES FOR A HEADACHE CLINIC AT
AUBMC

by
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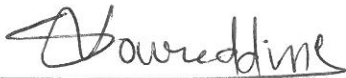
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AN ABSTRACT OF THE PROJECT OF

Solange Georges Shweyfati for Master of Nursing
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Title: Clinical guidelines for a headache clinic at AUBMC.

Headache disorders are among the most common disorders of the nervous system. They affect people from ages, races and ethnic groups. According to the International Classification of Headache Disorders III (2013), headaches are classified as primary, secondary or other types of headache. In general the global prevalence of headache is 46%. The most common types of primary headaches are tension-type headache (42%), migraine (11%), cluster headache (1%) and chronic daily headache (3%).

The different types of headache can lead to the inability of people to work or reduce their effectiveness, which may increase anxiety and impede their quality of life. The management of headache disorders is challenging, time consuming, needs a lot of support and one to one education. Thus, a specialized care through a headache clinic needed to be provided for those patients in order to improve their quality of life.

Therefore, establishing a multidisciplinary treatment program or a comprehensive care for headache in outpatient's setting at AUBMC will help in optimizing the care. In such multidisciplinary programs different disciplines work and collaborate among each other in order to provide holistic care. Within the multidisciplinary team, the role of the clinical nurse specialist (CNS) is significant in coordinating the work between all disciplines in order to enhance the care.

The proposed clinic at AUBMC involves members of nursing, medical and allied professionals. When admitted to the headache clinic, the patient will be assessed by the clinical nurse specialist and the clinician using specialized tools. The diagnoses and the treatment will be provided based on evidenced based clinical guidelines. Education pamphlets along with a headache diary will be provided to each patient. A plan of care will be developed for each patient and a follow-up process will be arranged by the clinical nurse specialist.

CONTENTS

ACKNOWLEDGEMENTS	v
ABSTRACT.....	vi

Chapter

I. INTRODUCTION.....	1
A. Background on Headache Disorders.....	1
1. Epidemiology and prevalence of headache disorders.....	1
2. Impact of headache on the quality of life	5
II. LITERATURE REVIEW	9
A. Different types of headache disorders	9
1. Subtypes of migraine	9
2. Tension-type headache	11
3. Cluster headaches	12
4. Other primary headache disorders	12
5. Medication overuse headache (MOH)	13
B. Triggering factors for different types of headache	14
C. Management of headache disorders	15
1. Treatment of migraine headache	16
a. Treatment of acute migraine	17
b. Prophylactic treatment of migraine	19
c. Pharmacological treatment of menstrual-associated migraine	22
2. Treatment of tension-type headache	22
3. Treatment of cluster headache	23
a. Pharmacological treatment of cluster headache	23

b. Acute treatment of cluster headache (CH)	23
c. Transitional therapy for cluster headache	24
4. Non-pharmacological treatment for primary headache disorders	24
a. Non-pharmacological treatment for migraine	25
b. Non-pharmacological treatment for tension-type headache (TTH)	26
5. Surgical treatment for headache	27
6. Models of headache management	30
a. Multidisciplinary team management	30
b. Role of the Clinical Nurse Specialist	32
III. THE PROPOSED HEADACHE CLINIC AT AUBMC	36
A. Referral and admission process to the headache clinic	38
B. Follow-up process to the headache clinic	39
C. Evaluation and Conclusion	39
REFERENCES.....	41
Appendices	
A. MIGRAINE PAMPHLET.....	48
B. CLUSTER HEADACHE PAMPHLET.....	50
C. TENSION-TYPE HEADACHE PAMPHLET	52
D. MULTIDISCIPLINARY TELEPHONE MESSAGE SHEET	54
E. ADMISSION AND CARE PLAN PROCESS TO THE HEADACHE CLINIC: FIRST REFERRAL	56

F.	HEADACHE CLINIC: ASSESSMENT TOOL FIRST VISIT DATABASE	57
G.	HEADACHE IMPACT TEST-6 (HIT-6)	63
H.	THE MIGRAINE DISABILITY ASSESSMENT TEST	66
I.	HEADACHE DIARY	68
J.	DIAGNOSIS ALGORITHM	69
K.	MIGRAINE TREATMENT ALGORITHM	70
L.	MIGRAINE PROPHYLACTIC TREATMENT ALGORITHM	71
M.	CLUSTER HEADACHE ALGORITHM	72
N.	TENSION-TYPE HEADACHE ALGORITHM	73

CHAPTER I

INTRODUCTION

A. Background on Headache Disorders

Headache is a subjective feeling of pain above the orbitomeatal line (The International Headache Society [IHS], 2013; The International Classification of Headache Disorders Third edition [ICHD], 2013). As the brain has no pain receptors, headaches are not felt in the brain. The pain is caused by disturbances of the pain-sensitive structures around the brain (IHS, 2013). According to MediLexicon's medical dictionary (2006) Headache means "Pain in various parts of the head, not confined to the area of distribution of any nerve".

1. Epidemiology and prevalence of headache disorders

Headache disorders are worldwide problems that affect people from all ages, races and ethnic groups. Headache disorders are among the most common disorders of the nervous system. It has been estimated that 47% of the adult population worldwide has experienced a headache at least once within one year (World Health Organization [WHO], 2012).

According to the ICHD (2013) there are three types of headache disorders: the primary headaches, the secondary headaches, and others like cranial neuralgias, central and primary facial pain. Primary headache disorders are not associated with an underlying pathological condition and include migraine, tension type headache and trigeminal autonomic cephalalgias as well as exertional headache, hemicranias continua and hypnic headache. Secondary headache disorders are associated with underlying

pathology and the origin of the headache can be trauma to the neck or head, nonvascular intracranial pathology, hemostatic disorder like thrombotic problems, infectious, psychiatric, facial sinuses' disorders, dental problems, neck and face diseases or drug induced disorders. The third class of headache disorders includes neuralgias and neuropathy (ICHD, 2013; Scottish Intercollegiate Guidelines Network [SIGN], 2008).

The global prevalence of adults with primary headache disorders is 46% for headache in general, of which 11% is migraine, 42% suffer tension-type headache and 3% have chronic daily headache (Stovner, et al., 2007). Tension-type and migraine headaches were ranked respectively as the second and third most common diseases in the world in both males and females by the Global Burden of Disease Survey (Wang et al., 2014). While tension-type headache is the most common type of headache, migraine is the most common type seen in practice (ICSI, 2013). According to the World Health Organization (WHO, 2012), around 324 million people suffer from migraine worldwide. In the United States, 18% of females and 8% of males suffer from migraine in any year. Migraine typically begins in adolescence and young adulthood and over 25% of migraine sufferers have more than three headache days per month. (Loder, 2010; ICSI, 2013)

Headache is a very common problem presenting to primary care clinicians. Three percent of patients visiting the emergency department and 1.3% in the outpatient setting complain of headache in the United States? (Institute for Clinical Systems Improvement [ICSI], 2013 (SIGN, 2008).

Some differences were noted in headache prevalence by demographic characteristics. In a study conducted by Buse et al. (2012), mailed surveys were sent to a sample of 120,000 subjects representative of the United States population. The study

showed that the prevalence for chronic migraine (CM) peaked in those aged in the 40s at 1.89% (prevalence point ratio 4.57; 95% confidence interval 3.13-6.67) for females and 0.79% (prevalence ratio 3.35; 95% confidence interval 1.99-5.63) for males. CM prevalence was also found to be inversely related to annual household income. The prevalence of CM among subjects who earn less than \$ 22,500 per year was found to be 2.71% for females and 1.32% for males compared to 0.52% for females and 0.23% for males in households with an income exceeding \$ 90,000 per year. This could be explained by the fact that those with CM required more days of absenteeism from work due to the chronic pain. Also, this suggests that stress and less access to proper medical treatment are associated with lower socio economical status and may be significant contributors to chronic migraine. The study also demonstrated that individuals with chronic migraine rated the highest score on the Migraine Disability Assessment Scale (37.96%) compared to those who have episodic migraine (9.50%). In summary, this study showed that the prevalence of chronic migraine is higher in females than males and in people with low socioeconomic status.

Another study conducted by Benoliel et al. (2011) showed that among 359 subjects, 298 (83%) reported having experienced headache in their life. Most of the headache disorders were episodic tension-type headache (56.9%) or migraine (19.2%). This study showed that subjects who suffer from headache have a family history of headache among their first-degree relatives and that headache was more prevalent in females than males as well.

In general, the Arab countries lack epidemiologic data on headache. In Lebanon, only one study examined the epidemiology of primary health problems in 1989. It showed that reported headache was more prevalent among females and in subjects with

higher educational levels. Headache was found to be more common among married and hypertensive subjects (Armenian, 1989).

The most recent study conducted to review the epidemiology of headache in the Arab countries was by Benamer et al. (2009), but it did not include any data on Lebanon. The prevalence of headache was reported only in three Arab countries. Al Rajeh et al. (1997) demonstrated that from a sample of 16,672 people in Saudi Arabia , the prevalence for headache in general was 12.1% from which 5% complained of migraine and 9.5% of tension-type headache. Similarly, another study by Jabbar and Oguniyi (1997) in Saudi Arabia showed that among 5,891 persons, 8% had headache in general of whom 2.6% complained of migraine and 3.1% of tension-type headache. Deleu et al. (2002) demonstrated that among 1, 158 people in Qatar 83.6% had headache in general, 10.1% migraine and 11.2% tension-type headache. While in Oman, Bener (2006) showed that among 1, 200 people 72% had headache in general from which 7.9% had migraine, however the prevalence of tension-type headache was not reported.

At the American University of Beirut Medical Center anecdotal evidence shows that the majority of the patients presenting to the neuroscience outpatient center suffer from different types of headache disorders. Because of lack of electronic medical records, accurate data or statistics on the number of patients diagnosed with headache disorders is still lacking, but from clinical observation it is estimated that the incidence seems to be in line with the literature.

2. Impact of headache on the quality of life

Patients who suffer from primary headaches usually have several accompanying symptoms such as; nausea, vomiting, fatigue, insomnia, dizziness, photophobia, phonophobia among others and symptoms burden that persist continuously like anxiety and stress. Maizels et al.(2004) reported that patients who suffer from chronic migraine and chronic daily headache had significantly more somatic symptoms than those with episodic migraine. The most reported symptoms were fatigue (73%), insomnia (60%), nausea and or indigestion (55%), extremity pain (49%), dizziness (48%) and back pain (46%). In addition to vomiting, photophobia and/or phonophobia, these symptoms lead to debility and reduced functional ability when present. Because headache is most common in younger people, its consequences include inability to work, reduced effectiveness and productivity, which in return increase the indirect financial costs of headache. A study conducted by Odegard et al. (2013) to examine the impact of headache and chronic musculoskeletal complaints on the risk of insomnia in Norway showed that subjects who suffer from headache less than seven days per month had 70% risk of insomnia, while those with headache more or equal than seven days per month had 120% increased risk of insomnia.

Similarly, in another study conducted by Engstrom et al. (2013) that migraineurs have significantly more subjective global sleep problems like insomnia, tiredness and pain related problems than healthy subjects.. Thus, insomnia impedes the quality of life and leads to more pain and anxiety problems. Moreover, it has been shown that those who experience headache attacks always worry about the next one and this may result in more anxiety and avoidance behavior. Subjects who suffer from headache tend to cancel

their social events and leisure activities, which can impair their quality of life even more (Stovner et al., 2014; Steiner et al., 2013).

Furthermore, the more severe migraine is the more anxiety and depression levels are. Yavuz et al. (2013) showed that among 55 migraineurs between the age of 15 and 50 years old, somatosensory amplification scores and depression scores were significantly higher in those who suffer from moderate and severe disability than those with minimal and mild disability. Depression, anxiety and stress levels were significantly higher among those who suffered from migraine compared to healthy subjects.

Headache disorders may impede the quality of life of the patients. A specialized care through a headache clinic needed to be provided for those patients in order to improve their quality of life.

The diagnosis of headache and migraine in particular is done accurately and rapidly by an experienced clinician and the emergence of evidenced-based treatment strategies has simplified the work of initiating individualized patient's treatment. Nevertheless, many patients with debilitating headaches fail to consult a doctor, or may not have their headaches properly identified or classified. There is evidence that migraine, in particular, is underdiagnosed and consequently many patients with migraine are either untreated or undertreated. Of those who consult a physician about their headaches, the majority are dissatisfied with the care they receive, often because they were unhappy with their healthcare provider or because they had experienced negative side effects from their medication (Matchar et al., 2008).

Moreover, usually the patient's knowledge about headache and its treatment is poor, which can lead to wrong conceptions of disease and insufficient therapy.

Education of patients is valuable in order to prevent medication overuse and that is why the major aims of the multidisciplinary treatment programs are to inform and educate patients better in handling headache and to improve therapy in order to reduce headache frequency and enhance quality of life (Gaulet al., 2011).

Additionally, Rozen (2006) showed that the most important thing to migraineurs when seeking a headache specialty clinic is that the physician involves them in the decision-making process of choosing a preventive agent. The second important thing is to take time with the patients to explain the possible side effects of the prescribed medications. Yet the effective implementation of the treatment plan demands a sophisticated level of patient understanding, thus it is impossible for the clinician alone to give one –to- one education. Providing a comprehensive management and education for patients with headache will lead to optimal benefit from the treatment regimens. Rothrock et al. (2006) revealed in his study that patients who were educated about their headache types, triggers and treatment had a significant decrease in their Migraine Disability Assessment Scale scores for an average of 21.2 points.

An outpatient multidisciplinary treatment program in Germany was effective in treating patients with frequent migraine, tension-type headache and medication overuse headache. Forty-three percent of all patients reached the primary endpoint of more than or equal 50% reduction of headache days per month. Therefore, the multidisciplinary treatment program reduced both headache days (on average minus five days per month) and medication intake (on average minus four days per month) (Gaul, , et al., 2011).

Therefore, establishing a multidisciplinary treatment program or a comprehensive care for headache in outpatient's setting helps in optimizing the care and prevention of future attacks. An interdisciplinary approach is often recommended and is

highly relevant in providing patients with chronic or refractory headache with appropriate therapeutic care (Gaul et al., 2011).

In summary, headache disorders affect people from all ages, groups and races. Headache disorders are classified as primary, secondary and other headache disorders. The different types of headache can lead to the inability of people to work or reduce their effectiveness, which may increase anxiety and impede their quality of life. In this project, the most common types of headaches will be defined along with their characteristics, diagnoses and treatment. In addition, the multidisciplinary management of headache and its significance will be discussed. The role of the clinical nurse specialist in the multidisciplinary management will be highlighted. A model of care will be proposed for the headache outpatient's clinic at the American University of Beirut Medical Center, including all the required assessment tools, clinical management guideline and patient education material.

CHAPTER II

LITERATURE REVIEW

A. Different types of headache disorders

The International Classification of Headache Disorders, third edition, classifies headache into primary headaches, secondary headaches and other headaches like cranial neuropathies and facial pains. In this chapter, the most common primary headaches will be defined and those include migraine, tension-type headache and trigeminal autonomic cephalalgias, as well as the medication overuse headache, which is one of the most common underlying causes of secondary types of headache (The International Classification of Headache Disorders Third edition [ICHD], 2013).

The most common types of headache disorders are migraine; tension-type-headache, cluster headache and medication overuse headache. For each type of headache there are subtypes that will be described in the below sections.

1. Subtypes of migraine

The major subtypes of migraine are migraine without aura and with aura, chronic migraine and menstrual migraine without aura (ICHD III, 2013).

Migraine without aura is a clinical syndrome characterized by headache with specific features and associated symptoms. It is defined as a recurrent headache disorder manifesting at least five attacks that last 4-72 hours and where at least two of the following four characteristics are present: unilateral location, pulsating quality, moderate or severe intensity, and aggravation by routine physical activity. During the

headache episode at least one of the following symptoms should be present: nausea and/or vomiting, photophobia and phonophobia (ICHD III, 2013).

An aura is primarily characterized as the transient focal neurological symptoms that usually precede or sometimes accompany the headache. Those aura symptoms are fully reversible and include visual, sensory, speech and/or language, motor, brainstem and retinal symptoms. In order to diagnose migraine with aura at least two attacks should occur with one or more of the fully reversible aura symptoms, and with at least two of the following four characteristics. At least one aura symptom spreads gradually over more than or equal five minutes and/or two or more symptoms occur in succession; each individual aura symptom lasts five to 60 minutes. At least one aura symptom is unilateral that affect one side of the body and the aura is accompanied or followed within 60 minutes by headache (ICHD III, 2013).

Chronic migraine is defined as “a headache that occurs 15 or more days per month for more than 3 months and which has the features of migraine headache on at least eight days per month in the absence of medication overuse” (ICHD III, 2013, p. 650; Carod-Artal, 2014). Chronic migraine is associated with deterioration in health-related quality of life and greater disability, with increased direct and indirect costs. Chronic migraine is triggered by the increased frequency of migraine attacks, risk factors and co-morbidities like chronic pain at other locations, mood disorders, some respiratory conditions and vascular risk factors (Carod-Artal, 2014).

Other common migraine subtypes include pure menstrual migraine without aura and menstruation related migraine without aura, which have the same criteria of migraine without aura. They both occur in menstruating women, exclusively on day 1 \pm 2 (i.e. days - 2 to +3) of menstruation in at least two out of three menstrual cycles. The

difference is that the pure menstrual migraine does only occur in the times of the cycle while the menstruation related migraine may occur at other times of the cycle too (ICHD III, 2013).

2. Tension-type headache

Tension-type headache is very common in the general population and has a very high socio-economic impact. It is divided into three major subtypes; the infrequent, frequent episodic and the chronic subtype (ICHD III, 2013).

Infrequent episodic tension-type headache is typically bilateral, pressing or tightening in quality and of mild to moderate intensity. At least two of the previous characteristics must be present in order to diagnose infrequent episodic tension-type headache. The headache usually lasts 30 minutes to seven days, does not worsen with routine physical activity and is not associated with nausea, but photophobia or phonophobia may be present (ICHD III, 2013).

The frequent episodic tension-type headache has the same diagnostic criteria as the infrequent type, but the difference is that at least ten episodes of headache should occur over 1 to 14 days per month in the acute TTH per month and on average more than three episodes per month (≥ 12 and < 180 days per year) (ICHD III, 2013).

The chronic tension-type headache is a disorder that evolves from the frequent episodic tension-type headache. It occurs more than 15 days per month on average, for more than three months (≥ 180 days per year), and can be associated with mild nausea, photophobia or phonophobia (International Headache Society [IHS], 2013; ICHD III, 2013) I referred to the APA book sixth edition it's correct.

3. Cluster headaches

The third main class of primary headaches includes trigeminal episodic cephalalgias (TACs), which includes five subtypes: the episodic and chronic cluster headache, the episodic and chronic paroxysmal hemicranias, the episodic and chronic Short-lasting Unilateral Neuralgiform headache attacks with Conjunctival infection and Tearing (SUNCT), the episodic and chronic Short-lasting Unilateral Neuralgiform headache attacks with cranial Autonomic symptoms (SUNA) and the hemicrania continua. The most common subtype of the TACs is the cluster headache (ICHD III, 2013; HIS, 2013).

Cluster headaches are defined as attacks of severe, strictly unilateral pain that is orbital, supraorbital and temporal, or in any combination of these sites, lasting 15–180 minutes and occurring from once every other day to eight times a day. At least one of the following symptoms or signs must be present ipsilateral to the headache: conjunctival injection, lacrimation, nasal congestion, rhinorrhoea, forehead and facial sweating, miosis, ptosis and/or eyelid edema, and/or with restlessness or agitation. The episodic cluster headache attacks occur in periods lasting from seven days to one year, separated by pain-free periods lasting at least one month. On the other hand, the chronic cluster headache attacks may occur for more than one year without remission, or with remission periods lasting less than one month (ICHD III, 2013; IHS, 2013). When it is an organization or groups it's written like that in subsequent citations in text.

4. Other primary headache disorders

Other primary headache disorders are grouped into four categories: headache associated with exertion including primary cough headache, primary exercise headache,

primary headache associated with sexual activity and primary thunderclap headache. Headache attributed to direct physical stimuli includes cold-stimulus headache and external-pressure headache. Epicranial headaches include the primary stabbing headache and nummular headache and other miscellaneous primary headache disorders include hypnic headache and newly daily persistent headache (IHS, 2013; ICHD III, 2013).

5. Medication overuse headache (MOH)

Medication overuse headache (MOH) is one of the most important secondary types of headache. It is defined as a headache occurring on 15 or more days per month, developing as a consequence of regular overuse of acute or symptomatic headache medication (on ten or more, or 15 or more days per month, depending on the medication), for more than three months. It usually, but not invariably, resolves after the overuse is stopped. Medication-overuse headache is usually an interaction between a therapeutic agent used excessively and a susceptible patient. Most of the patients with MOH had previously primary headache disorders such as migraine or tension-type headache. Almost half of the patients who have headache for 15 days or more per month and for more than three months have medication overuse headache. The MOH include ergotamine-overuse headache, triptan-overuse headache, simple analgesic-overuse headache, paracetamol (acetaminophen)-overuse headache, acetylsalicylic acid-overuse headache, other non-steroidal anti-inflammatory drug (NSAID)-overuse headache, opioid-overuse headache and combination-analgesic-overuse headache (IHS, 2013).

B. Triggering factors for different types of headaches

Triggering factors have been identified for different types of headache, mainly migraine and tension type headache. Many factors may trigger migraine including; environmental (heat, cold, head or neck injury, odors, bright lights or glare, noise, weather changes, high altitude, motion and physical strain), lifestyle habits (chronic high levels of stress, disturbed sleep patterns, skipping meals or poor diet and smoking), hormonal (puberty, menopause, menstruation or ovulation, pregnancy, using oral contraceptives or estrogen therapy), emotional (anxiety, depression, anger, excitement or exhilaration). Some medications may also trigger migraine like nitroglycerin, nifedipine, oral contraceptives and hormone therapy. Also some foods are usually infrequent triggers for migraine attacks and vary from patient to patient, like citrus fruit, aspartame, caffeine, aged cheese, chocolate, alcohol (red wine, beer), foods containing nitrites and foods containing monosodium glutamate (Institute for Clinical Systems Improvement [ICSI], 2013).

The risk factors of chronic migraine are divided into modifiable and non-modifiable factors. The modifiable risk factors include anxiety and depression, obesity ($BMI > 30 \text{ kg/m}^2$), stressful life events, heavy caffeine consumption, tobacco use and overuse of unsuccessful treatment headache medications. The non-modifiable factors include genetic susceptibility, older age, female sex, low educational level, low income and Caucasian ethnicity (Carod-Artal, 2014). Chronic daily headache is also associated with the overuse of analgesics for the acute treatment of headaches. The use of analgesics for more than 15 days per month may increase the risk of chronic daily headaches or medication-overuse headaches (ICSI, 2013).

Similarly, multiple psychological and behavioral factors contribute to the development or the precipitation of tension-type headache. The psychological factors include external stressors, distress, psychiatric co morbidity such as anxiety and depression; and the lifestyle factors include delayed or skipped meals, sleep disruption, caffeine consumption and medication overuse (Nash, 2013).

Little is known about the triggering factors for cluster headache, but smoking and alcohol overuse were suspected to be triggers for cluster headache sufferers (Rozen, 2005).

C. Management of headache disorders

Headache disorders are usually diagnosed by history and physical examination, with limited need for imaging or laboratory tests, except for acute headaches. A detailed history (including past medical history, social history and family history) must be taken and a focused physical and neurological exam should be done for the patient who presents with a headache. The history should inquire about functional disabilities at work, school, housework or leisure activities during the past three months. The assessment of the headache characteristics requires determination of time from onset to peak of headache, usual time of onset (season, month, menstrual cycle, week, hour of day), frequency and duration of the headache episodes, and if stable or changing over the past six months and lifetime. The quality of the headache must be assessed such as pulsatile, throbbing, pressing, sharp etc., its location (unilateral or bilateral or changing sides), severity, precipitating features and factors that aggravate the headache, factors that relieve the headache, history of other medical problems, pharmacological and non-

pharmacological treatments that are effective or ineffective, and the presence of aura (ICSI, 2013; Forbes, 2014).

The focused physical examination includes vital signs (blood pressure, respirations, pulse and temperature), body mass index and a complete neurological exam, along with a general medical examination (Forbes, 2014).

Causes for concern must be evaluated in order to diagnose any secondary headache disorders. The warning signs of possible disorders other than primary headaches are subacute and/or progressive headaches that worsen over time, a new or different headache, any headache of maximum severity at onset, headache of new onset after age 50, persistent headache precipitated by a valsalva maneuver, fever, hypertension, myalgias, weight loss, or scalp tenderness suggesting a systemic disorder, presence of neurological signs that may suggest a secondary cause and seizures (ICSI, 2013).

After the physician diagnoses the headache and categorizes it, illness severity must be assessed. The goals of treatment are to reduce the intensity, frequency and duration of acute attacks, improve the quality of life and avoid medication overuse headache (Bigale, Rapaport, & Hargreaves, 2003). It is important that the clinician categorizes the headache according to the severity, duration of symptoms and time to peak impairment because this will influence later the choice of the treatment method (ICSI, 2013).

1. Treatment of migraine headache

There are four severity levels for migraine headache: mild, moderate, severe and status levels. When the patient complains of a mild headache, he is aware of having

a headache but is able to continue with daily routine with minimal alteration. A moderate headache will inhibit daily activities but is not incapacitating, while the severe one is incapacitating and the status level is a severe headache that lasts more than 72 hours (ICSI, 2013). It is important before selecting a pharmacological treatment of migraine to take into consideration the co morbid disorders, the specific needs and expectations of the patient (Del Rio, & Silberstein, 2001). The management of migraine is divided into pharmacologic and nonpharmacologic approaches. Pharmacologic treatment is divided into preventive and acute treatment. The preventive treatment is taken on daily basis whether or not headache is present, while the acute treatment is taken to treat attacks when they arise (Bigale, & Lipton, 2003; Rapaport, 2008).

a. Treatment of acute migraine

The pharmacological options for acute treatment of patients with mild migraine headache include analgesic medications such as paracetamol; non-steroidal anti-inflammatory drugs (NSAIDs) such as acetylsalicylic acid and naproxen sodium; serotonin (5 HT) receptors agonists (triptans) like almotriptan, eletriptan, frovatriptan, naratriptan, rizatriptan, sumatriptan, naproxen and zolmitriptan; antiemetic drugs such as metoclopramide and promethazine; and others like nasal lidocaine and caffeine (ICSI, 2013).

Lipton et al. (1998) demonstrated that the combination of acetaminophen, aspirin, and caffeine was highly effective for the treatment of migraine headache pain. The study showed that pain intensity was reduced two hours after the treatment with two tablets composed of acetaminophen, caffeine and aspirin, to mild or no pain in 59.3% of drug-treated patients and in 32.8% of placebo-treated patients. By six hours

after the dose 79% versus 52%, respectively, had pain reduced to mild or none. The drug combination has an excellent profile and is well tolerated. The combination of acetaminophen, aspirin and caffeine alleviated significantly the nausea, photophobia, phonophobia, and functional disability associated with migraine attacks two to six hours after the treatment.

The Almotriptan Early Migraine Intervention Study (AEGIS) demonstrated that treating migraine pain with almotriptan 12.5mg within one hour of onset of the headache produced significant therapeutic benefit and patients achieved two hours of pain-free status. Also, the Almotriptan 12.5 mg times vs. Intensity Migraine Study (AIMS) demonstrates that when almotriptan 12.5mg was taken within one hour of onset of migraine pain, the median pain duration was significantly shorter than when taken more than one hour after pain onset (Valade, 2009).

For patients complaining of moderate headache migraine, ergot derivative classes are added to the treatment such as dihydroergotamine mesylate (DHE) and ergotamine tartarate (Del Rio, & Silberstein, 2001; ICSI, 2013).

For patients complaining of severe migraine headache, the pharmacological options increase and include dopamine receptor agonists like prochlorperazine and, chlorpromazine, NSAID's like ketorolac intramuscular and other drugs like magnesium sulfate; also intravenous anticonvulsant such as intravenous valproate sodium are added to the serotonin receptors agonists(triptans) and ergotamine (DHE) (Del Rio, & Silberstein, 2001; ICSI,2013).

Status migraine that lasts more than 72 hours is treated with adjunctive therapy in addition to the medications used for severe headache. Keeping the patient in a dark quiet room, intravenous rehydration, caffeine intake and antiemetic drugs are added.

Then the patient may be started on dihydroergoetamine mesylate (DHE) if he/she does not have the following conditions such as pregnancy and breastfeeding, history of ischemic heart disease, history of Prinzmetal's angina, severe peripheral vascular disease, onset of chest pain following administration of test dose, has received triptan or ergot derivative within 24 hours, and having elevated blood pressure. DHE is also contraindicated for patients with hemiplegic or basilar-artery migraine and cerebrovascular diseases. If DHE is contraindicated, then chlorpromazine, intravenous valproate sodium, intravenous magnesium sulfate or prochlorperazine can be used. If the treatment is still not successful opiate or dexamethasone are the last drugs of choice.

Thus as the severity of migraine headache increases, more drugs of various classes are added to the treatment regimen.

b. Prophylactic treatment of migraine

Preventive treatment is used in patients with migraine, chronic migraine or other headaches like hemiplegic migraine or basilar artery migraine. Patients who have more than four to eight headaches per month or two or more days of headache-related disability per month, or those who are not rapidly responsive to treatment are candidates for preventive therapy (Rapoport, 2008). The goals of the preventive treatment are to reduce the attack frequency, duration and severity, improve responsiveness to treatment of acute attacks, reduce migraine associated disabilities and prevent the occurrence of a medication overuse headache (MOH) (Estemalik, & Tepper, 2013; Scottish Intercollegiate Guidelines Network [SIGN], 2008).

The American Headache Society with the American Academy of Neurology guidelines, the Canadian and the European (EFNS) guidelines on migraine prevention

treatment consider the beta-adrenergic blocking agents such as metoprolol and timolol and propranolol and an anti-epileptic drug such as topiramate and divalproex as level A drugs (this indicates high quality evidence) to be offered to patients requiring prophylaxis (Loder et al., 2012). A number of studies showed the effectiveness of beta blockers. Propranolol and metoprolol are shown to be effective for migraine prevention (class I in the US 2012 guidelines). In their study, Schellenberg et al., (2008) found metoprolol and nebivolol to be both effective in the prophylaxis of migraine. The patients treated with metoprolol and nebivolol had their migraine attacks significantly decreased similarly in the two groups relative to baseline, namely from 3.4 to 1.3 attacks for patients treated with metoprolol and from 3.3 to 1.3 attacks for nebivolol. Diener et al. (2001) demonstrated that metoprolol at 200mg per day reduced significantly by 50% migraine frequency when compared to aspirin 300 mg per day.

On the other hand, level B drugs that are effective and should be considered for patients requiring prophylaxis when level A drugs fail include amitriptyline, NSAIDs, riboflavin (vitamin B12), venlafaxine and subcutaneous histamine.

The antiepileptic drugs used in the prevention of chronic migraine include topiramate, gabapentin and divalproex. Silberstein et al. (2009) showed in his randomized clinical study that patients who received topiramate at a dose of 100mg per day had a significant decrease in the mean monthly headache days (5.8 days for topiramate treated patients and 4.7 for placebo treated patients). Similarly, another study by Silberstein et al., (2004) demonstrated that topiramate at a dose of 100 or 200 mg/d reduced significantly migraine frequency, days and acute medication use. The mean monthly days were reduced for the patients treated with topiramate 100mg/d from 6.4 days to 3.7 and from 6.6 days to 3.9 for those treated with 200mg/d of topiramate. In

another European study conducted by Diener et al. (2007), topiramate at a mean dose of 100 mg per day significantly reduced the mean number of monthly migraine days by 3.5 compared with placebo treated patients.

According to the US 2012 guidelines, divalproex was shown to be a level A anti-epileptic drug with established efficacy for the prophylactic treatment of migraine. A double –blind randomized study by Freitag et al. (2002), demonstrated that extended-release divalproex sodium at a dose of 500-1,000mg per day for twelve weeks reduced the migraine attacks from 4.4 attacks per week to 3.2 per week while in the placebo group the rate decreased from 4.2 attacks per week to 3.6 attacks per week only.

Similarly, Gabapentin was shown to be a significantly effective prophylactic agent for patients with migraine, yet the data on gabapentin is still limited. In one study by Mathwe, Rapoport, and Sapel (2001), gabapentin was administered to a group of patients during a 12 week period at a dose of 2400mg/day. At the end of the 12 weeks, the median four week migraine rate was decreased from 4.2 to 2.7 for the gabapentin treated patients versus from 4.1 to 3.5 for the placebo treated patients.

Also, Botulinum toxin, a neurotoxin produced by anaerobic bacterium *Clostridium botulinum*, can improve several painful conditions including migraine. Recently, onabotulinumtoxinA injectable has been studied in the treatment of chronic migraine and shown to reduce the mean frequency of headache days. Aurora et al. (2011) revealed in their study that 70% of patients injected with onabotulinumtoxinA (Botox), at a maximum dose of 195 units exhibited 50% decrease from baseline in migraine and headache days at week 56 of the program. The injected muscles included procerus, bilateral corrugators, frontalis, temporalis, occipitalis, cervical, paraspinal, and superior trapezius muscles. The most frequently reported adverse events are neck pain

when onabotulinumtoxinA is administered as intra muscular injections to the neck muscles and muscular weakness, which reflects the local pharmacological effects of onabotulinumtoxinA.

c. Pharmacological treatment of menstrual-associated migraine

The treatment of menstrual-associated migraine is the same as the treatment for migraine but if it is not successful then the physician may consider cyclic prophylaxis with NSAIDs and triptans. If still no improvement after all the previous therapy is achieved then hormone prophylaxis will be considered. Oral zolmitriptan 2.5 mg was found to be effective and very well tolerated for patients experiencing regular menstrual migraine attacks by Tuschman et al. (2008). Patients were treated with zolmitriptan 2.5 mg three times or twice daily versus placebo treatment. The frequency of menstrual migraine attacks decreased by 58.6% when treated three times daily and by 54.7% for the twice daily treatment versus 37.8% for the placebo group.

2. Treatment of tension-type headache

The treatment of acute TTH includes pain killers such as acetaminophen, aspirin and anti-inflammatory medications (Bigal & Lipton, 2008). Steiner, Lange, and Voelker (2003) demonstrated that both aspirin (500mg and 1000mg) and acetaminophen (1000mg) were superior to placebo in the treatment of episodic tension-type headache. Two hours after the treatment with 1000 mg of aspirin, 75.7% of the patients felt totally relieved, and 70.3% of the patients were relieved after an aspirin dose of 500 mg. The percentages of the patients, who were treated with paracetamol at a dose of 1000mg or

500mg and were totally relieved, were 71.2% and 63.8% respectively, while in the placebo group 54.5% of the patients were relieved.

The preventive treatment is considered for patients with chronic tension-type headache (CTTH) or with those with episodic tension-type headache and more than eight headache days per month, and in those with disability. Prophylactic treatment include amitriptyline, the most studied medications that showed effectiveness in reducing CTTH (Bigal et al., 2008). A study by Holroyd et al. (2001), revealed that tricyclic antidepressant such as amitriptyline hydrochloride, up to 100 mg/d, or nortriptyline hydrochloride, up to 75 mg/d combined with stress management therapy significantly reduces tension-type headache index scores by more than 50%.

3. Treatment of cluster headache

a. Pharmacological treatment of cluster headache

Cluster headache is the most common subtype of the trigeminal episodic cephalalgias (TACs). It causes a severe pain and most sufferers would choose death instead of suffering. That is why cluster headache is nicknamed as the “suicide headache” (Todd, 2005). There are three modalities of therapy for cluster headache: the acute therapy, the transitional therapy and the preventive therapy.

b. Acute treatment of cluster headache (CH)

Oxygen inhalation is the treatment of choice for acute cluster headache and the treatment that showed most effectiveness. Typical dosing is 100% oxygen given by way of a non-rebreather face mask at seven to ten Liters per minute for 20 minutes (Todd, 2005). Cohen, Burns, and Goadsby (2009) demonstrated that inhaling oxygen (8 to 12

litres/minutes) through a close-fitting mouth nose mask renders 78% of patients free of pain within 15 minutes. Oxygen therapy is safe and can be used several times during the day. Other pharmacological treatments include the triptans; sumatriptan injectable and intranasal. Ekbom et al. (1995) showed that sumatriptan injectable is effective in 76% to 100% of all CH attacks within 15 minutes, even after repetitive daily use for several months. Sumatriptan nasal spray has been shown to be effective in the treatment of cluster headache as well. Van Vliet et al. (2001) demonstrated in his study that intranasal sumatriptan reduced cluster headache pain from very severe, severe, or moderate to mild or no pain in 30 minutes in 58% of sumatriptan users versus 30% of patients given placebo on the first CH attack.

c. Transitional therapy for cluster headache

Transitional therapy is a short-term preventive treatment that bridges the time between cluster diagnosis and the time when the traditional maintenance preventive agent becomes efficacious. Thus the patient will be pain free and will have no gap in headache preventive coverage (Todd, 2005). The best treatment for the transitional phase is a short course of corticosteroids. In his study Kawada et al. (2013) showed that high-dose methylprednisolone (MP) (250-500mg) therapy reduced cluster headache attack frequency with intervals between attacks ranging from four months to 23 months, and improved quality of life.

4. Non-pharmacological treatment for primary headache disorders

The Institute for Clinical Systems Improvement recommends that caregivers consider education and lifestyle management options essential non pharmacological

treatment for all headache patients. All patients should be informed to maintain a headache diary in order to clarify the frequency, severity, triggers and treatment responses to their headaches. The proper education will help the patients in understanding the disorder and identifying the headache triggers, which will help them in changing their lifestyle, therefore improving their quality of life. The patients should be educated about maintaining a healthy lifestyle: proper nutrition, regular physical activity, adequate sleep and stress reduction strategies. The workplace ergonomics should also be addressed because neck tension can have a negative effect on headache frequency (ICSI, 2013). Moreover, education about acute and prophylactic treatment is needed for the patients and may improve their adherence to pharmacological and non-pharmacological options (Gaul et al., 2011). The main role of the specialty nurse in an outpatient's headache clinic is to provide support and advice about lifestyle issues, triggering factors, use and change of medication or withdrawal from overused analgesics. The nurse in an outpatient clinic will collect the headache history, assess the level of disability, provide and assess headache diaries and monitor the progress of each patient in order to optimize the care (Gaul, et al., 2011).

a. Non-pharmacological treatment for migraine

Adjunctive therapies that can be helpful in reducing the frequency and severity of migraine headache include physical therapy and physical fitness, especially for patients who had a neck or head trauma, psychological therapy such as relaxation therapy (progressive muscular relaxation, breathing exercises and directed imagery) (ICSI, 2013), coping strategies and stress management in order to decrease stress and anxiety, and yoga or meditation that may be helpful to some people. The American

Academy of Neurology in 2000 recommended in the evidenced-based guidelines for migraine that relaxation training, thermal biofeedback combined with relaxation training, and electromyography biofeedback may be considered as treatment options for the prevention of migraine with a grade A level of evidence (Silberstein, 2000). Non-pharmacological therapies are used mainly to prevent headaches not to treat them and most of the clinical studies showed that adjunctive therapies when used with pharmacological treatment are more beneficial in improving headaches.

b. Non-pharmacological treatment for tension-type headache (TTH)

Adjunctive drug therapy such as stress management (relaxation training and problem-solving methods), physiotherapy and pain management may help in reducing TTH by reducing muscle tension and the triggers that precipitate headaches. A study conducted by McCrory et al. (2001) suggested that behavioral therapy such as relaxation training and electromyography biofeedback alone or combined together, may improve tension-type headaches by 40% to 50%. Attention control techniques, including guided imagery with a focus on a pleasant image and concentration with a focus on a neutral stimulus, allow attention to be shifted away from the pain stimulus toward some neutral or pleasant activity. Guided imagery can serve as a brief relaxation and an attention control strategy to cope with pain (Nash, 2013).

For patients who suffer from tension-type headache that failed all medical therapies, cognitive therapies or transcutaneous electrical nerve stimulation may be offered and physical therapy such as craniocervical exercises may reduce tension-type headache over a prolonged period of time (ICSI, 2013). Van Ettekoven, and Lucas (2005) showed that patients who were treated with cranocervical training physiotherapy

for a period of six months had more than 50% decrease in headache frequency at follow-up assessment immediately after the treatment and six months later, and a decrease in medication intake of 60%. Torelli, Jensen, and Olesen (2004) found that physiotherapy significantly reduced the number of headache days. The average number of days with headache over a four week period was reduced from 16.3 to 12.3 days in the last four weeks of treatment.

Moreover, Holroyd et al. (1991) evaluated the comparative and combined effects of drug and behavioral treatment for tension-type headache. Cognitive behavioral therapy showed to be as effective as amitriptyline for patients with episodic and chronic tension type headache.

5. Surgical treatment for headache

There are several invasive options used to treat patients who suffer from cluster headache, chronic migraine, occipital neuralgia and trigeminal autonomic cephalalgias like the implantation of peripheral neurostimulator or peripheral nerve decompression, vagal nerve stimulator or deep brain stimulators (British Association for the Study of Headache guidelines [BASH], 2007; SIGN, 2008). One of the first surgical treatments of migraine involved surgical decompression of cervical nerve roots. This procedure requires extensive dissection of the neck thus it is associated with a high morbidity rate. Furthermore, pain recurrence was common either due to regeneration of the nerve or entrapment by scar tissue, with 11-12% of patients requiring reoperation (Hong & Roberts, 2014).

Another technique is the deep brain stimulation. Deep brain stimulation (DBS) began during the 1950s for the treatment of chronic pain. It consists of the placement of electrodes through the skull and cortex to the subcortical structures within the brain in order to stimulate these structures and modulate their function. Many studies were done on DBS and its effect on headache. Leone (2006) found that from 16 patients treated with DBS, 81% were pain free or had only sporadic attacks. Also, Shoenen et al. (2005) showed that half of the patients studied were pain free or had more than 50% reduction in the frequency of cluster headache after being treated with DBS. Blacket al. (2007) demonstrated in their study that 100% of the patients complaining of cluster headache had more than 50% reduction in the frequency of headache after DBS. Although DBS is effective most of the time in treating cluster headache, significant adverse effects result from this technique such as subclinical hemorrhage, intra-operative hypertension followed by aneurysm rupture and death, transient hemiplegia with loss of consciousness and subcutaneous infection (Jenkins & Tepper, 2011).

Furthermore, Peripheral nerve stimulation (PNS) was also studied in patients with chronic migraine, occipital neuralgias, and trigeminal autonomic cephalalgias. A permanent occipital nerve stimulator is inserted for patients who failed for six months the medical management. Unilateral or bilateral electrodes are inserted in the region of the greater occipital nerves at the level of the C1 lamina. Most of the studies showed improvement in the frequency and severity of headache; nevertheless, the insertion of these stimulators is associated with significant complications rates like lead migration, infection, pain at the generator site, decreased or lack of efficacy, and intolerable stimulation side effects such as painful paresthesias (Hong & Fanciullo, 2014).

Other less invasive treatments used for headache include the vagal nerve stimulation (VNS). VNS was studied in the treatment of episodic migraine, chronic migraine and chronic cluster headache. The stimulating electrode is usually wrapped around the vagus nerve in the neck, next to the carotid artery (Jenkins & Tepper, 2011). In a study conducted by Hord et al. (2003) on four patients with episodic migraine, 75% of them had more than 50% reduction in the frequency, intensity and severity of migraine after the VNS. Another study by Mauskop (2005) on patients suffering from chronic migraine showed that 25% of the patients had more than 50% reduction in the frequency, and the severity of headache. On the other hand, 100% of the patients with chronic cluster headache had significant reduction in the Migraine Disability Assessment (MIDAS) score. However, many side effects were reported after the surgery including postsurgical infection, transient left vocal cord paralysis and lower facial muscle paralysis. Also, side effects of stimulation involved mild to moderate dyspnea and voice alteration.

Invasive treatments for headache disorders showed to be effective in reducing headache days but due to their severe side effects those treatments are not commonly used in practice.

The treatment of headache disorders is challenging for practitioners or neurologists in a private setting. Patients complaining of frequent and severe headaches need a lot of support and education about the pathophysiology and the treatment of their headaches. Thus, multidisciplinary headache treatment centers are an option to optimize care and merge medical and non-medical treatments in a comprehensive therapeutic environment. Therefore, following a comprehensive approach to care, the patients will be involved in the implementation of the therapeutic regimen, which will help them

become more adherent to treatment. Otherwise, non-adherence may result in treatment failure (Gaul et al., 2011). In such multidisciplinary programs, the role of the nurse is crucial in optimizing the care. The nurse assesses the patient, plans the care with the neurologist, educates, monitors the progress of care and coordinates the work by collaborating with other health care professionals.

6. Models of headache management

a. Multidisciplinary team management

There are two types of programs used in most of the headache outpatient's clinics. The multidisciplinary therapy or the comprehensive, intensive chronic pain rehabilitation program (CPRP).

The typical multidisciplinary program consists of a team of neurologists, behavioral and clinical psychologists, physical and sports therapists and headache nurses or nurse practitioner, in addition to consultants from psychosomatic medicine and the psychiatry departments. On the other hand, the comprehensive, intensive chronic pain rehabilitation program (CPRP) is provided by an integrated team of professionals working together in the same setting. It focuses not only on physical pain but its association with mood and function as well. The program includes physical and psychological therapies, education, and medication management and the treatment emphasizes not only on patient recovery, but also on the maintenance of the patient's well-being after the completion of the program. The difference between this program and the multidisciplinary headaches programs is that in the CPRP the patients are treated for multiple complaints of pain that are not necessarily headache related. CPRP includes a behavioral and psychodynamic approach to treatment with group and

individual psychotherapy, as well as biofeedback-assisted psychotherapy, physical and occupational therapy, cognitive behavioral therapy, educational sessions, and medication management. The program requires weaning from all habituating substances, including all opioids, benzodiazepines, and sedative/hypnotics regardless of a patient's addictive status (Zheng, Tepper, Covington, Mathews, & Scheman, 2013).

Zheng et al. (2013) showed that an interdisciplinary chronic pain rehabilitation program significantly improves the patient's mood, pain and function after the treatment. Function and depression returned to the normal range and on average anxiety levels improved from moderate to mild but did not normalize. Similarly, Lemstra, Stewart, and Olszynski (2002) found that patients with migraine who received three months of multidisciplinary management that included exercise therapy, massage therapy, and lectures regarding stress management, relaxation therapy, and diet versus standard therapy reported significantly greater reduction in pain frequency ($p=0.000$), intensity ($p=0.001$), and duration ($p=0.000$), greater improvement in functional status ($p=0.000$) and quality of life ($p=0.000$) and less depression ($p=0.000$).

Matchar et al., (2008) developed and tested a similar model headache management program as well. The model offered structured care that included patient education, accurate headache diagnosis and appropriate treatment and follow-up. It allowed the primary care physician to refer difficult-to-manage chronic headache patients to a comprehensive service in which a neurologist worked with a nurse to provide triage, education, referral to behavioral and non-pharmacological therapies, and intensive patient supervision. The findings showed that a systematic approach to headache care is practical and achievable in a general clinical setting and effectively reduced headache disability in a wide range of patients. The patients who were assigned

to the program had an improvement in their Migraine Disability Assessment Scale (MIDAS) scores by seven points more than the control group at six months, and improvements in their quality of life, depressive symptoms and satisfaction in headache management. The intervention effects persisted to the 12 months after the patient concluded participation in the clinic (Matchar, 2008).

Multidisciplinary treatment programs showed to be effective in treating patients with headache disorders. In such programs different disciplines work and collaborate among each other in order to provide holistic care. Within the multidisciplinary team, the role of the clinical nurse specialist (CNS) is significant; the CNS acts as a leader in coordinating and collaborating the work between all disciplines in order to enhance the care.

b. Role of the Clinical Nurse Specialist

The main role of the clinical nurse specialist in headache clinics was educational and found to be crucial and essential in providing holistic care. The nurse is the first caregiver to examine the patient, fill the database, the Headache Impact Test-6, the Migraine Disability Assessment Scale (MDAS) and to educate the patients and their families on headache types, triggers and treatment by giving educational sessions or pamphlets.

The impact of a nurse led headache program on patient outcome was examined by Harpole et al. (2003); 54 migraine patients were enrolled in a structured management program that lasted for six months and involved group and individual sessions. The program manager who is a nurse practitioner with expertise in headache evaluation and management led the individual and group sessions. At the first group session, patients

were educated about headache types, triggers, and treatment, interacted with other patients, reviewed educational materials, and were taught how to use headache diaries. Then the nurse reviewed all the participant's medical records. If further assessment or physical examination was needed to diagnose or clarify the patient's headache types then the nurse practitioner would meet individually with each participant either before or directly after the group session. After the group session, the nurse helped each patient in completing a one page treatment worksheet, along with the treatment plan. At six months post intervention their Migraine Disability Assessment Scale (MIDAS) scores had decreased significantly with an average of 21.2 points compared to the MIDAS baseline scores with an average of 41.6 points. Patients in this study reported 14.5 fewer days with headache over the preceding three months (Harpole et al; 2013).

Similarly, Blumenfeld and Tischio (2003) found that adult headache patients referred from primary care providers who initially attended an educational session conducted by a neurologist and a nurse practitioner and were subsequently evaluated and managed by a nurse practitioner demonstrated significant improvement in their migraine status and their quality of life relative to their pre intervention baseline status. At their eight week follow-up, 92% of the patients reported an improvement of their headaches from baseline. This improvement was sustained throughout the six month duration of the program. The authors also noted that the patients' visits to the primary care provider or to an emergency department for headache were decreased significantly ($p<0.01$).

The role of case management in a headache clinic at the Naval Hospital in Jacksonville was also studied by Sobkowski and Maquera (1996). The patients were enrolled in the headache clinic and followed by the case manager in consultation with

the neurologist who initially evaluated them, and then they were followed on weekly to monthly schedule in the clinic by the nurse. The role of the nurse case manager was to monitor the patients closely for their response to medication regimen through the use of a headache calendar. The patients received from the case manager a one hour lecture, which was open to the family; it consisted of various aspects of headache care including precipitators, medications, the uses and side effects and other alternative methods for controlling headache like biofeedback, pain management clinic and chiropractic. Over the course of one year, the percentage of headache referrals from primary care physicians who saw patients complaining of headache dropped from 60% to 20% because the patients were instead going directly to the headache clinic rather than through primary physicians. The patients indicated that in a headache clinic they were better educated about their headache, understood that headaches were more of a common problem, especially that they had group sessions with other patients. The fact that the patients were seen frequently by the case manager and had ready access to the neurology clinic for additional treatment allowed the patients to be monitored and treated aggressively. This approach resulted in more patients' satisfaction, becoming more knowledgeable and more compliant in the use of their medications.

Likewise, Tischio (2001) examined the effect of a headache management program coordinated by a nurse practitioner and a neurologist in Southern California on patients' satisfaction and outcomes. The results showed that 92% of the patients who were part of the program were more satisfied with their care and showed improvement in their health status. In this program the neurologist gave two hours headache class that introduced the patients to the different types of headache with their respective various treatments. The next step was a scheduled appointment with the nurse practitioner

headache specialist who assessed the patients, reviewed the case with the neurologist in order to develop an individual treatment plan and arranged an eight week follow-up. Because the patients were more satisfied and had better outcomes, they used the health system less; therefore decreased the utilization costs. Thus, the group model of care with a headache specialist neurologist and nurse practitioner showed to be a cost effective method of providing care to primary headache patients.

At the American University of Beirut Medical Center a headache clinic was launched in 2014 at the Neuroscience outpatient center. However, a multidisciplinary team does not yet provide the management of the patients with headache disorders. The aim of this project is to propose a multidisciplinary management for the headache clinic at AUBMC with the purpose of providing the best services, quality of care and excellence in patient- centered care and to highlight the important role of the clinical nurse specialists in such a program.

CHAPTER III

THE PROPOSED HEADACHE CLINIC AT AUBMC

The proposed model for the headache clinic at AUBMC includes a multidisciplinary team that incorporate a medical director, a neurologist, a nurse practitioner or a clinical nurse specialist, a dietitian, a physical therapist, a pharmacist, a clinical psychologist and consultants from the psychiatry department. Below is a description of the roles of the various team members.

The headache clinic medical director will be consulted for business and case review for quality assurance. He/she responds to administrative concerns within the clinic, approves clinical guidelines and coordinates interdepartmental collaboration.

The neurologist and program director will be responsible for the coordination of the care, management of individual patients, disease management evaluation, referrals and collaboration with primary physicians. The physician will be responsible to inform the patient about the diagnoses, triggering factors, the acute and prophylactic treatment plans, along with the clinical nurse specialist.

The role of the nurse or a Clinical Nurse Specialist (of course) in the outpatient headache clinic will be crucial in coordinating the care among all disciplines, in educating the patients and their families, assessing the patients along with the neurologist in order to devise a holistic plan, monitoring the care and the use of medications and their side effects, along with following up on the patients' responses to the treatment using the proposed headache diary. Non pharmacological interventions will be guided by the nurse with follow up on the consultation with other disciplines when needed.

The role of the clinical nurse specialist is important in providing educational materials for the patients (leaflets, pamphlets or books) (Refer to appendices A, B and C educational pamphlets) on headache diseases and leading group sessions for patients and their families. Three educational pamphlets were prepared on migraine, cluster and tension type headaches. The nurse will also receive telephone messages from the patients in order to follow-up on them. Telephone calls are essential for monitoring drug adherence, side effects, the disease progress and other alternative activities such as physical therapy (Refer to Appendix D telephone message sheet and questioning).

In the proposed headache clinic, a comprehensive case management support includes a dietician, a physical therapist, a pharmacist and a psychologist. The dietician is present on consultation basis. She evaluates dietary intake, gives instructions with regard to specific patients' needs and reports back to the headache clinic team.

The physical therapist is also available on consultation basis, especially for the patients with tension-type headaches and migraine. He/she can help the patients through physical training and giving practical advice on energy conservation.

The pharmacist is also available when needed and within the premises (a satellite pharmacy is available at the basement of building 23 at the MS center), he/she can advise the patients on the use of medications, educate them about the side effects and help the clinical nurse specialist in following up on the treatment adherence and possible drug interactions.

The team includes also a psychologist or psychotherapist, who will always be available upon consultation from the psychiatry department in order to help patients in stress management, doing biofeedback-assisted therapy, and cognitive behavioral therapy.

A. Referral and admission process to the headache clinic

Any patient presenting to his/her primary care physician for a chief complaint of primary headache disorders is eligible to be referred to the headache clinic for further evaluation and management.

All the patients will follow the same pathway and this is elaborated in Appendix E admission process to the headache clinic. The patient is first seen by the nurse who completes a detailed data assessment on an electronic medical record along with the Headache Impact Test-6 (HIT-6) and the Migraine Disability Assessment Scale only for patients diagnosed with migraine. (Refer to Appendices F, G and H). The HIT-6 and the MIDAS tests are both commonly used in evaluating the impact of headache on the quality of patient's life. A thorough health history including medication lists and physical examination, including the neurological exam will be performed and documented by the neurologist and the clinical nurse specialist (CNS). Then the physician with headache specialty may order additional diagnostic tests to rule out secondary headaches. Thereafter, the plan of care will be put using the appropriate clinical algorithm by the neurologist and the CNS who will follow up on the patient and will be responsible of consulting other disciplines when needed. The CNS will give the patient a headache diary sheet in order to be filled until the next visit. (Refer to Appendix I headache diary sheet). Education about the headache type, triggering factors along with the treatment plan, medications side effects and medication-overuse headache will be given by the nurse at the end of the visit with the help of other disciplines. When needed, the nurse will schedule appointments for the patients with the other disciplines such as physical therapists and psychotherapists. The diagnosis process

and the treatment for acute migraine, chronic migraine, cluster and tension-type headaches will be provided as per the algorithms in Appendices J, K, L, M and N.

B. Follow-up process to the headache clinic

Patients with minimal to mild headache will be asked to present for follow-up in eight weeks after the first visit with the neurologist and the CNS in the outpatient's headache clinic. Patients with severe headaches may need to be followed-up regularly in the clinic; the predetermined intervals can range from weekly to once per month and the purpose of the visit is to optimize the patient's care. A follow-up can be done also by telephone messages where the patients can seek advice or alternative treatment.

On the follow-up visit, the patient is expected to bring back the headache diary sheet to the nurse and to fill the Headache Impact Test-6 (HIT-6) or the Migraine Disability Assessment Scale for patients with migraine only. The nurse will be responsible to fill the assessment tool for the follow-up visit and the patient is then assessed by the physician. The plan of care is then adjusted according to the patient's needs, the headache diaries and according to the comparison between the MIDAS and the HIT-6 scores at baseline and on the follow-up visit. Education is then given by the nurse as needed (Refer to Appendix O follow-up assessment tool).

C. Evaluation and Conclusion

Headaches are among the most frequent symptoms seen in general practice. Headache disorders are associated with personal and societal burdens of pain, disability and poor quality of life. Multidisciplinary headache programs are sought to deliver high quality of care and improve patients' outcomes. Moreover, the role of the clinical nurse

specialist in the management of patients with headache disorders was found to be effective in delivering high quality of care by assessing, educating, planning and monitoring the care of the patients. The clinical nurse specialist is the key team player in such a program. He/She collaborates with all the health care professionals with the aim of delivering excellence in patient-centered care.

In any disease management program, there must be a continuous evaluation of the impact of the program of care. In the proposed headache clinic, clinical outcomes will be measured by the percentage of patients showing improvement in the functional status using the headache diaries, the Headache Impact Test-6 (HIT-6) and the Migraine Disability Assessment Scale (MIDAS) for migraine. A comparison of the baseline and the follow-up scores will be important for the evaluation of the efficacy of the treatment in the headache clinic. Headache diaries are considered primary measures of headache frequency, duration and severity per month. A baseline measurement is needed for all the tools used and after a minimum of four weeks from baseline. In addition, the patient's satisfaction surveys done every six months as part of outpatient clinic operations can also help to improve the clinical service as well.

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APPENDICES

APPENDIX A

MIGRAINE PAMPHLET



Definition:

Migraine is one of the most common types of headache disorders.

The pain usually is:

- Unilateral
- Of pulsating quality
- Moderate or severe intensity
- Aggravated by routine physical activity
- Associated with symptoms like nausea and/or vomiting, phonophobia and photophobia
- Preceded or accompanied by reversible neurological symptoms (visual, sensory, speech and/or language, motor, brainstem and retinal symptoms)
- Maybe associated with menstruation
- Able to impede the quality of life

Triggers:

- Environmental (hot, cold, noise, weather changes, etc.)
- Lifestyle habits (stress, skipping meals, smoking, etc.)
- Hormonal (menstruation, menopause, pregnancy, etc.)
- Emotional (anxiety, depression, anger, etc.)
- Some foods (caffeine, alcohol, aged cheese, chocolate, etc.)

Home Instructions:

- Take only medications prescribed by a Doctor
- Avoid excessive use of analgesics, as the pain may increase
- Life style changes may be needed like doing regular exercises, sleeping well and eating 4 to 5 meals per day
- Relaxation training and cognitive-behavioral therapy may be helpful
- Avoid some triggering foods

Seek medical care if:

- You have problems with your medications
- You get no relief from medications

Seek immediate medical care if:

- If your headache gets very bad
- If you have a temperature by mouth above 38.9°C (102°F)
- If you have problems with your vision or trouble walking
- If you have muscle weakness or loss of muscle control

APPENDIX B
CLUSTER HEADACHE PAMPHLET



Definition:

Cluster headache cluster headache is a primary headache disorders.

The pain usually occurs with:

- Severe intensity
- Associated symptoms like lacrimation, nasal congestion, rhinorrhea, forehead and facial sweating, constriction of the pupils, falling of the upper or lower eyelid, eyelid edema, restlessness and agitation
- Strictly unilateral pain
- Impede the quality of life

Triggers:

- Alcohol consumption
- Exposure to solvent vapor like gasoline
- High altitudes

Home instructions:

- Take only medications prescribed by a Doctor
- Avoid excessive use of analgesics, as pain may increase
- Avoid alcohol consumption especially during an attack
- Avoid exposure to gasoline

Seek medical care if:

- You have problems with your medications
- You get no relief from medications

Seek immediate medical care:

- If your headache gets very bad
- If you have a temperature by mouth above 38.9°C (102°F)
- If you have problems with your vision or trouble walking
- If you have muscle weakness or loss of muscle control

APPENDIX C
TENSION-TYPE HEADACHE PAMPHLET



Definition:

Tension-Type Headache is one of the most common types of headache.

The pain usually occurs:

- Bilaterally
- With mild to moderate intensity
- With a pulling feeling, pressure sensations
- With contraction of head and neck muscles
- With no associated symptoms like nausea and vomiting
- With no neurologic symptoms that precede the headache (aura)
- Without interference with normal activities

- Without influence by routine physical activity
- Photophobia and phonophobia may be present

TRIGGERS:

- Stress
- Feeling worried (anxiety)
- Feeling sad for a long time (depression)
- Fatigue
- Lack of sleep
- Delayed or skipped meal
- Caffeine consumption
- Medication overuse

HOME INSTRUCTIONS:

- Take only medications prescribed by a Doctor
- Avoid excessive use of analgesics, as pain may increase
- Apply ice or hot packs for 15 to 20 minutes 3 to 4 times daily
- Do physical therapy sessions
- Relaxation training and cognitive-behavioral therapy may be helpful
- Life style changes may be needed like doing regular exercises, sleeping well and eating 4 to 5 meals per day

SEEK MEDICAL CARE IF:

- You have problems with your medications
- You get no relief from medications
- You feel sick in your stomach (nausea) or throw up (vomiting)

SEEK IMMEDIATE MEDICAL CARE:

- If your headache gets very bad
- If you have a temperature by mouth above 38.9°C (102°F)
- If you have problems with your vision or trouble walking
- If you have muscle weakness or loss of muscle control

APPENDIX D

MULTIDISCIPLINARY TELEPHONE MESSAGE SHEET

Patient name----- Patient Number -----
Date-----Time----- Telephone -----
MD Name----- RN Name -----

Patient Message:	
Message received by:	Signature:
Action Plan:	
Patient informed by:	Date:
Time:	
MD Signature:	RN Signature:

Telephone Calls Questioning:

- 1- Did you fill your headache diary from your last visit?
- 2- How many headache days did you have?
- 3- What was the average of the intensity of pain?
- 4- Did you have any trigger?
- 5- Are you taking your medications as prescribed and for how long?
- 6- Did you have any side effects secondary to your treatment?
- 7- Did you have any changes in your habits, diet or environmental factors?

8- Did you throw up with your headache? If yes, was it a projectile vomiting?

9- How do you feel in general?

10- How can I help you?

APPENDIX E

ADMISSION AND CARE PLAN PROCESS TO THE HEADACHE CLINIC: FIRST REFERRAL

<p style="text-align: center;">ADMISSION AND CARE PLAN PROCESS TO THE HEADACHE CLINIC: FIRST REFERRAL</p>
<p>Referral Process</p> <ul style="list-style-type: none">∂ Patient is referred by a primary physician
<p>Clinical Nurse Specialist Assessment</p> <ul style="list-style-type: none">∂ Patient is first assessed by the headache nurse∂ An electronic Medical record is initiated∂ Complete physical exam, full history, vital signs, weight, and medication list are gathered∂ Headache Impact Test-6 is performed∂ For patients diagnosed with migraine the Migraine Disability Assessment scale is performed
<p>Neurologist with headache specialty Assessment</p> <ul style="list-style-type: none">∂ Patient is seen by the Neurologist with headache specialty∂ MRI/CT brain is ordered when secondary headaches are suspected∂ Blood tests requested as needed∂ Other diagnostic tests as needed:
<p>Collaboration and Consultation</p> <ul style="list-style-type: none">∂ The attending and the nurse devise a plan of care that is then followed up by the CNS∂ The CNS educate the patients/families on types of headaches, triggers, treatment and provide the patients with a headache diary and educational pamphlets∂ The pharmacist is consulted on all the patients with headache∂ If the patient has dietary concerns, the dietician is consulted∂ If the patient has tension-type headache and migraine, the physical therapist is consulted∂ If the patient has psychological problems or disabilities, a psychologist/psychiatrist is consulted

APPENDIX F

HEADACHE CLINIC: ASSESSMENT TOOL FIRST VISIT DATABASE

Personal Information	
Patient name: First-----Middle-----Last Date of Birth:-----Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female Insurance: <input type="checkbox"/> None <input type="checkbox"/> NSSF <input type="checkbox"/> HIP <input type="checkbox"/> Private <input type="checkbox"/> Other: Occupation: Marital Status: <input type="checkbox"/> Married <input type="checkbox"/> Single <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed Emergency Contact: Name: Phone: Relation to patient:	Patient Number: Date: Time: Address: Education: <input type="checkbox"/> None <input type="checkbox"/> High school or less <input type="checkbox"/> College Number of children:
Present Complaint/ Purpose of Visit:	
BP-----/-----mmHg <input type="checkbox"/> Right Arm <input type="checkbox"/> Left Arm Pulse:----- per minute Temp:-----°C <input type="checkbox"/> Oral <input type="checkbox"/> Axillary Respiration-----per minute Height:-----cm Weight:-----Kg BMI:-----Kg/m ²	
Allergies: <input type="checkbox"/> No <input type="checkbox"/> Yes (specify):	
Social Assessment: Smoking <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Cigarettes (Amount in packs per day-----) <input type="checkbox"/> Hubble Bubble Alcohol <input type="checkbox"/> No <input type="checkbox"/> Yes Amount per day----- Caffeinated Foods(tea, coffee, chocolate) <input type="checkbox"/> No <input type="checkbox"/> Yes Amount per day----- Possible abuse/neglect: <input type="checkbox"/> No possible abuse/neglect <input type="checkbox"/> Possible abuse/neglect	
Psychological Screening During the past month have you been bothered by feeling down, depressed, hopeless, or having little interest or pleasure in doing things? <input type="checkbox"/> No <input type="checkbox"/> Sometimes <input type="checkbox"/> Regularly	
Functional Screening 1. Have you lost balance, fallen or needed assistance of any kind to prevent you from falling? <input type="checkbox"/> No <input type="checkbox"/> Yes 2. Do you have a problem in performing daily life activities such as bathing, toileting, feeding, dressing and moving from one place to another? <input type="checkbox"/> No <input type="checkbox"/> Yes	
Nutritional Screening	

Are you following any special diet? No Yes (low animal fat; diabetic; low salt, etc.). Specify-----

Obstetric and Gynecologic History: (For women only)
 Last menstrual period----- Last Gynecologic exam----- Last PAP smear-----
 Pregnancies----- Miscarriages----- Last Mammogram-----

Personal/Family Medical History (if yes specify P (Patient) or F (Family) near the box)
 Skin problem Vision or eye problems Ear/Nose/Throat problems Lung disease Diabetes
 Tuberculosis Psychological problems High blood pressure Heart disease Thyroid
 Stroke Injuries or accidents Stomach/Intestinal problem Blood disease Cancer
 Kidney problems Prostate problems Bladder or urinary problem Seizure Hepatitis
 Gynecological problems Others:

Current medications (name, dose and frequency)

What medications have been tried before for headaches and for how long? (name, dose and frequency)

Previous Hospitalization Surgeries

QUESTIONS	YES	NO
Did you ever have headaches that put you in bed or took you out of school or activities as a child?		
Did you ever see a doctor for childhood headaches?		
Did you ever been carsick?		

Did you ever have head, neck, or jaw injury?		
Did you ever lost consciousness for any reason?		
Did you ever have a fall on your back or tailbone?		
Did you ever have a motor vehicle accident?		
Have you seen doctors other than your family doctor about your headaches?		
If you are female , have you ever had a headache near your menstrual cycle?		
If yes, when during your cycle? -----		
Do you get a warning that a headache is coming?		
Do you throw up with your headaches?		
Does your neck hurt when you have a headache?		
Do your eyes and/or nose run when you have a headache?		
Do you feel nauseated or queasy with your headache?		
Have you ever had a CT scan?		
Have you ever had an MRI?		
Have you ever had a spinal tap?		
Have you ever had blood tests?		

I first started having headaches at age of:							
My most recent headaches started at age:							
The number of days without any headache at all in a month would be:							
What things trigger your headache? (Food, smells, things in your environment etc.)							
In an average week I have about this many total headaches: Circle one number:							
0	1	2	3	4	5	6	7
In an average week I have about this many severe headaches: Circle one number:							

0	1	2	3	4	5	6	7			
Average of your pain score according to the verbal descriptive scale: Circle one number: (1minimal---10 very severe)										
0	1	2	3	4	5	6	7	8	9	10
My headaches are:	Aching	Throbbing/pounding	Pressure/squeezing	Stabbing	Shooting					
My head hurts:	On one side	On both sides	In the front	In the back	All over					
My headache, when severe, is worse with:										
Smells	Foods	Bright Light	Loud Noise							
Moving my head	Lying down	Standing Up	Walking the stairs							
My headache usually lasts:										
Less than 1 minute	Less than one hour	1-3 hours	4-12 hours							
13-24 hours	25-48 hours	More than 48 hours	It never goes away							
When I have a headache, I:										
Keep doing what I was doing	Take a pill and keep doing what I was doing	Have to lie down								
Physician's Section (history of present illness, physical examination, diagnostic tests, diagnoses etc.)										

Demonstration

Video

Physician Name:-----

Signature:-----

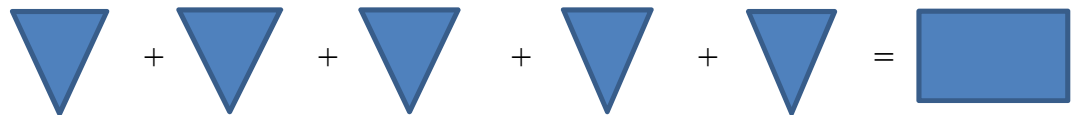
Nurse Name:-----

Signature:-----

APPENDIX G

HEADACHE IMPACT TEST-6 (HIT-6)

1	<ul style="list-style-type: none"> • When you have headaches, how often is the pain severe? • Never Rarely Sometimes Very Often Always
2	<ul style="list-style-type: none"> • How often do headaches limit your ability to do usual daily activities including household work, work, school, or social activities? • Never Rarely Sometimes Very Often Always
3	<ul style="list-style-type: none"> • When you have a headache, how often do you wish you could lie down? • Never Rarely Sometimes Very Often Always
4	<ul style="list-style-type: none"> • In the past 4 weeks, how often have you felt too tired to do work or daily activities because of your headaches? • Never Rarely Sometimes Very Often Always
5	<ul style="list-style-type: none"> • In the past 4 weeks, how often have you felt fed up or irritated because of your headaches? • Never Rarely Sometimes Very Often Always
6	<ul style="list-style-type: none"> • In the past 4 weeks, how often did headaches limit your ability to concentrate on work or daily activities? • Never Rarely Sometimes Very Often Always



Column 1	Column 2	Column 3	Column 4	Column 5	Total
(6 points each)	(8 points each)	(10 points each)	(11 points each)	(13 points each)	

Score:

Score range is 36-78

What Does Your Score Mean?

If You Scored 60 or More

Your headaches are having a very severe impact on your life. You may be experiencing disabling pain and other symptoms that are more severe than those of other headache sufferers. Don't let your headaches stop you from enjoying the important things in your life, like family, work, school or social activities.

If You Scored 56 – 59

Your headaches are having a substantial impact on your life. As a result you may be experiencing severe pain and other symptoms, causing you to miss some time from family, work, school, or social activities.

If You Scored 50 – 55

Your headaches seem to be having some impact on your life. Your headaches should not make you miss time from family, work, school, or social activities

If You Scored 49 or Less

Your headaches seem to be having little to no impact on your life at this time. We encourage you to take HIT-6 monthly to continue to track how your headaches affect your life.

If your Score on HIT-6 is 50 or Higher

You should share the results with your doctor. Headaches that are disrupting your life could be migraine. Take HIT-6 with you when you visit your doctor because research shows that when doctors understand exactly how badly headaches affect the lives of their patients, they are much more likely to provide a successful treatment program, which may include medication.

HIT is also available on the Internet at www.headachetest.com.

HIT-6 Scoring Interpretation English Version 1.1 ©2001 QualityMetric, Inc. and GlaxoSmithKline Group of Companies

APPENDIX H

THE MIGRAINE DISABILITY ASSESSMENT TEST

The Migraine Disability Assessment Test

The MIDAS (Migraine Disability Assessment) questionnaire was put together to help you measure the impact your headaches have on your life. The information on this questionnaire is also helpful for your primary care provider to determine the level of pain and disability caused by your headaches and to find the best treatment for you.

INSTRUCTIONS

Please answer the following questions about ALL of the headaches you have had over the last 3 months. Select your answer in the box next to each question. Select zero if you did not have the activity in the last 3 months.

_____ 1. On how many days in the last 3 months did you miss work or school because of your headaches?

_____ 2. How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches? (Do not include days you counted in question 1 where you missed work or school.)

_____ 3. On how many days in the last 3 months did you not do household work

(such as housework, home repairs and maintenance, shopping, caring for children and relatives) because of your headaches?

_____ 4. How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches? (Do not include days you counted in question 3 where you did not do household work.)

_____ 5. On how many days in the last 3 months did you miss family, social or leisure activities because of your headaches?

_____ Total (Questions 1-5)

_____ A. On how many days in the last 3 months did you have a headache? (If a headache lasted more than 1 day, count each day.)

_____ B. On a scale of 0 - 10, on average how painful were these headaches? (where 0 = no pain at all, and 10 = pain as bad as it can be.)

APPENDIX I
HEADACHE DIARY

Name -----

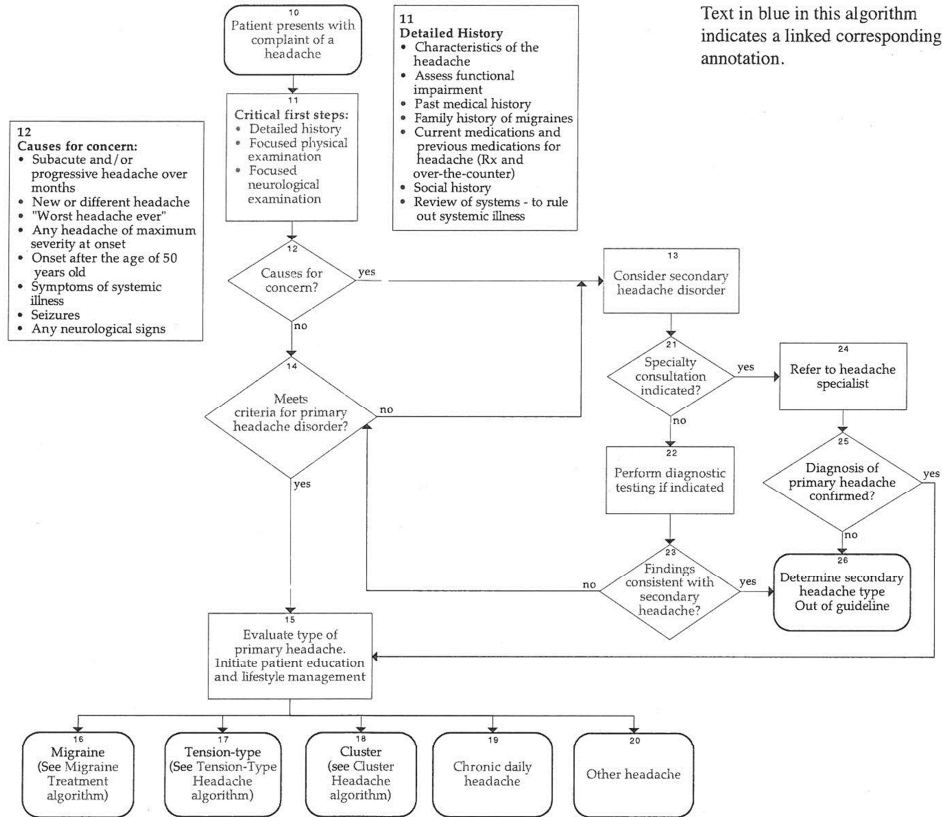
Date	Duration of headache	Pain intensity (1-10)	Possible trigger	Relief/Treatment

APPENDIX J

DIAGNOSIS ALGORITHM

*Diagnosis and Treatment of Headache
Eleventh Edition/January 2013*

Diagnosis Algorithm



Sinus Headache 15

Migraine-associated symptoms are often misdiagnosed as "sinus headache" by patients and clinicians. Most headaches characterized as "sinus headaches" are migraines.

The International Classifications of Headache Disorders (ICHD-II) defines sinus headache by purulent nasal discharge, pathologic sinus finding by imaging, simultaneous onset of headache and sinusitis, and headache localized to specific facial and cranial areas of the sinuses.

[Return to Table of Contents](#)

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2

APPENDIX K

MIGRAINE TREATMENT ALGORITHM

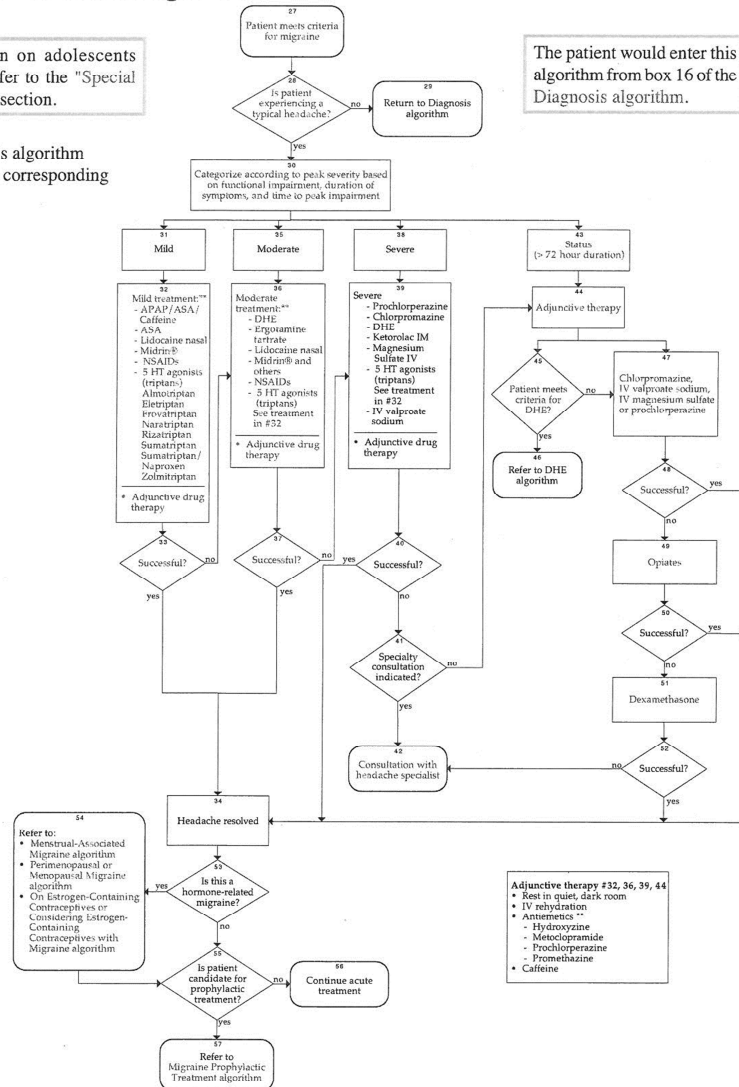
Diagnosis and Treatment of Headache
Eleventh Edition/January 2013

Migraine Treatment Algorithm

For information on adolescents (ages 12-17), refer to the "Special Circumstances" section.

The patient would enter this algorithm from box 16 of the Diagnosis algorithm.

Text in blue in this algorithm indicates a linked corresponding annotation.



Return to Table of Contents

Institute for Clinical Systems Improvement

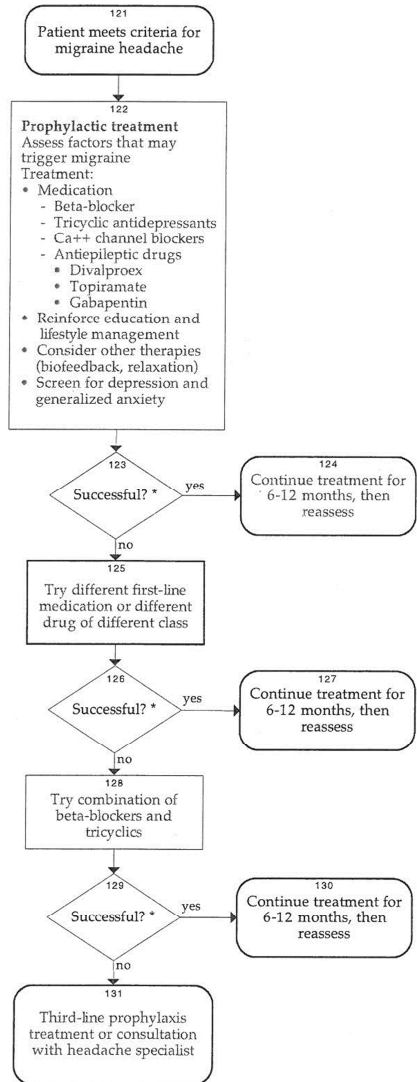
www.icsi.org

APPENDIX L

MIGRAINE PROPHYLACTIC TREATMENT ALGORITHM

*Diagnosis and Treatment of Headache
Eleventh Edition/January 2013*

Migraine Prophylactic Treatment Algorithm



Text in blue in this algorithm indicates a linked corresponding annotation.

Patients enter this algorithm from box 57 of the Migraine Treatment algorithm.

*123, 126, 129. Successful? Success as determined by:
 • Headaches decrease by 50% or more
 • An acceptable side effect profile

[Return to Table of Contents](#)

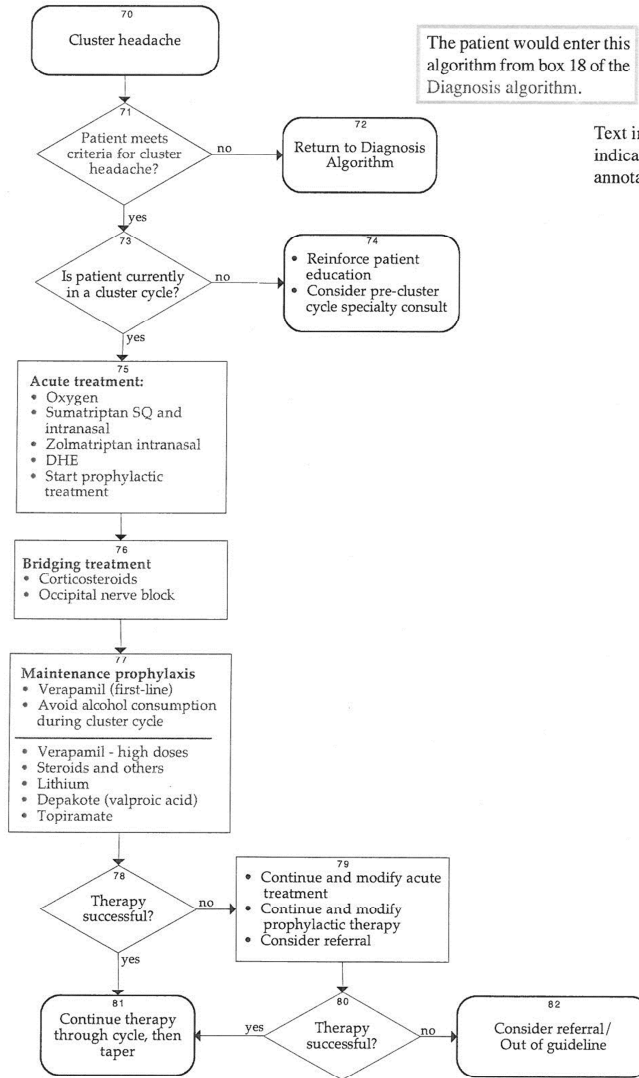
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APPENDIX M

CLUSTER HEADACHE ALGORITHM

*Diagnosis and Treatment of Headache
Eleventh Edition/January 2013*

Cluster Headache Algorithm



The patient would enter this algorithm from box 18 of the Diagnosis algorithm.

Text in blue in this algorithm indicates a linked corresponding annotation.

Return to Table of Contents

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5

APPENDIX N

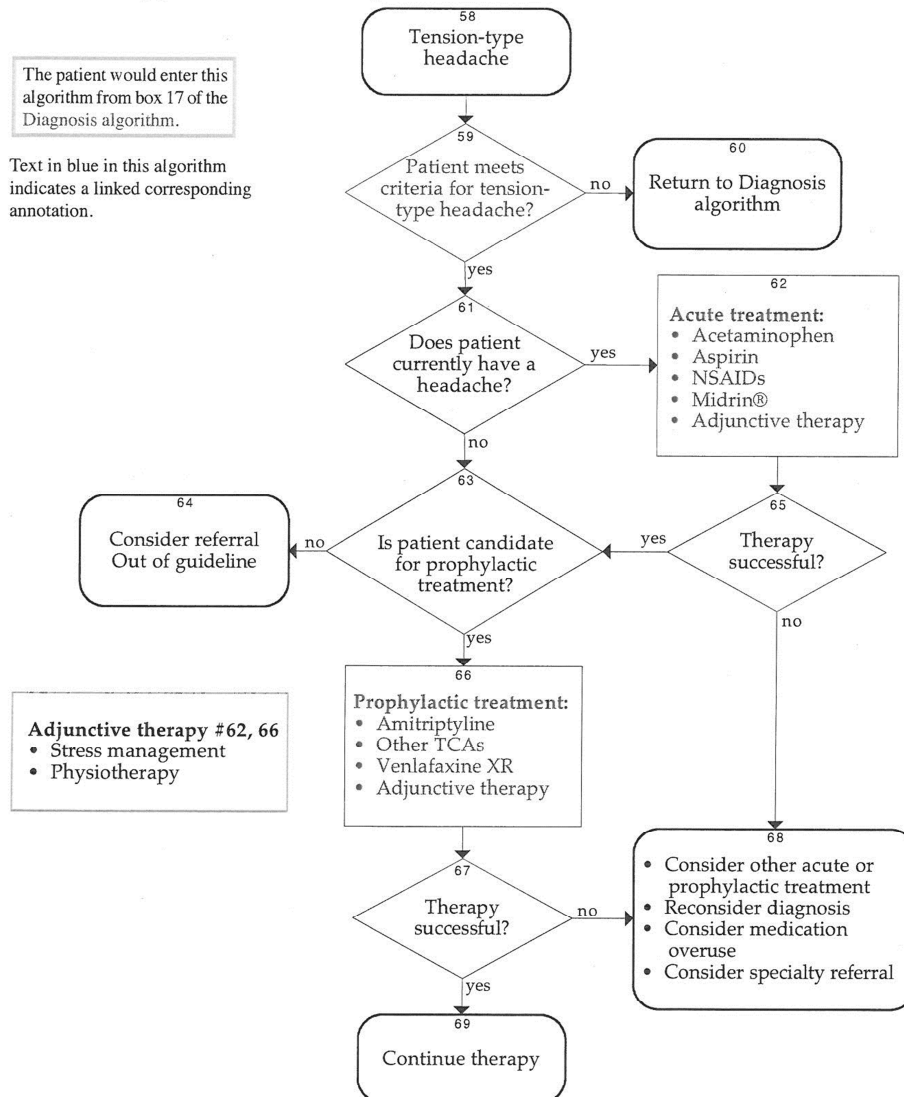
TENSION-TYPE HEADACHE ALGORITHM

Diagnosis and Treatment of Headache
Eleventh Edition/January 2013

Tension-Type Headache Algorithm

The patient would enter this algorithm from box 17 of the Diagnosis algorithm.

Text in blue in this algorithm indicates a linked corresponding annotation.



Adjunctive therapy # 62, 66

- Stress management
- Physiotherapy

Return to Table of Contents

Institute for Clinical Systems Improvement

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4