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Migraine

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Abstract: Migraine is the most common disabling brain disorder. Chronic migraine, a condition characterized by the experience of migrainous headache on at least 15 days per month, is highly disabling. Patients with chronic migraine present to primary care, are often referred for management to secondary care, and make up a large proportion of patients in specialist headache clinics. Many patients with chronic migraine also have medication overuse, defined as using a compound analgesic, opioid, triptan or ergot derivative on at least 10 days per month. All doctors will encounter patients with chronic headaches. A basic working knowledge of the common primary headaches, and a rational manner of approaching the patient with these conditions, allows a specific diagnosis of chronic migraine to be made quickly and safely, and by making this diagnosis one opens up a substantial number of acute and preventive treatment options. This article discusses the current state of management of chronic migraine.

IMG.01 - MIGRAINE

I. INTRODUCTION

Migraine is a common disabling brain disorder. Headache accounts for 4.4% of all consultations in general practice approximately 5% of all medical admissions to hospital, and approximately 20% of neurology outpatient consultations. Migraine affects over 20% of people at some point in their lives; epidemiological studies have shown that 4.5% of the population of Western Europe has headache on at least 15 days per month; global studies suggest that approximately 1% of the world's population may have chronic migraine. Chronic migraine imposes a substantial economic burden on society. Migraine is so common that, even though for many people it is no more than an inconvenience, the cumulative burden of the disorder caused it to rank in the top 40 conditions causing worldwide disability according to the World Health Organization's 2012 global burden of disease figures, above all other neurological disorders other than stroke, meningitis and epilepsy; in the United Kingdom it ranks third behind stroke and the dementias, causing the loss of 230,000 DALYs (Disability-Adjusted Life Years) annually.

Chronic migraine is the term that the International Classification of Headache Disorders (ICHD) uses to describe patients with frequent headaches, believed to be biologically migrainous. The meaning of the term 'chronic migraine' has evolved over the last two decades, as it has steadily replaced earlier terminology such as 'chronic daily headache' and 'transformed migraine . There is ongoing debate about whether a further subdivision of the diagnosis should be created to specify patients who are refractory to treatment. The broader acceptance of the concept that migraine can be a chronic condition has led to increasing interest in the pathophysiology, epidemiology, and treatment of this condition.

Patients with chronic headaches have in the past experienced the adverse effects of lack of education about headaches, and therapeutic nihilism. There is now no excuse for either of these factors to impact upon the management of these patients. As this article will show, it is almost always possible to make a specific diagnosis in patients with chronic migraine, and by making this diagnosis one opens up a substantial number of treatment options.

A. Migraine Histry

The word migraine was derived from the Latin word "hemicrania" meaning "half" (**hemi**) "skull" (**crania**). This term was first used by Galenus of Pergamon to describe the pain felt across one side of the head during a migraine. He also suggested that the pain originated in the menenges and vasculature of the head.

B. When Migraine Start

Most medical experts believe the attack begins in the brain and involves nerve pathways and chemicals. The changes affect blood flow in the brain and surrounding tissues. Migraine headaches tend to first appear **between the ages of 10 and 45**. Sometimes, they begin earlier or later.

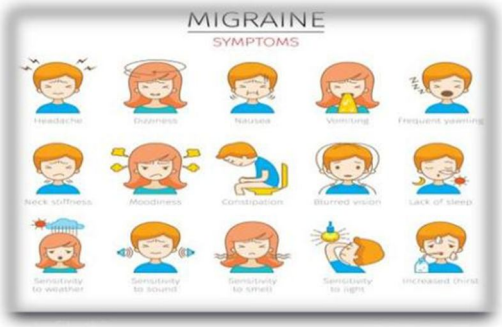
II. SYMPTOMS OF MIGRAINE

The primary symptom of migraine is a headache. Pain is sometimes described as pounding or throbbing. It can begin as a dull ache that develops into pulsing pain that is mild, moderate or severe. If left untreated, your headache pain will become moderate to severe. Pain can shift from one side of your head to the other, or it can affect the front of your head, the back of your head or feel like it's affecting your whole head. Some people feel pain around their eye or temple, and sometimes in their face, sinuses, jaw or neck.

IMG.02 –Symotoms Of Migraine

A. Other Symptoms Of Migraine Headaches Include

1) Sensitivity to light, noise and odors.
2) Nausea and vomiting, upset stomach and abdominal pain.
3) Loss of appetite
4) Feeling very warm (sweating) or cold (chills)
5) Pale skin color (pallor).
6) Feeling tired.
7) Dizziness and blurred vision.
8) Tender scalp.
9) Diarrhea (rare).



IMG.03 – OTER SYMPTOMS Fever (rare).

Most migraines last about four hours, although severe ones can last much longer.
Each phase of the migraine attack can come with different symptoms:

B. Prodrome Symptoms

1) Problems concentrating.
2) Irritability and/or depression.
3) Difficulty speaking and reading.
4) Difficulty sleeping. Yawning.
5) Nausea.
6) Fatigue.
7) Sensitivity to light and sound.
8) Food cravings.
9) Increased urination.
10) Muscle stiffness.

IMG.04 –OTHER SYMPTOMS

C. Aura Symptoms

1) Numbness and tingling.
2) Visual disturbances. You might be seeing the world as if through a kaleidoscope, have blurry spots or see sparkles or lines.
3) Temporary loss of sight.
4) Weakness on one side of the body.
5) Speech changes.

D. Headache Symptoms

1) Neck pain, stiffness.
2) Depression, giddiness and/or anxiety.
3) Sensitivity to light, smell and sound.
4) Nasal congestion.
5) Insomnia.
6) Nausea and vomiting.

E. Postdrome Symptoms

1) Inability to concentrate.
2) Depressed mood.
3) Lack of comprehension.
4) Euphoric mood.

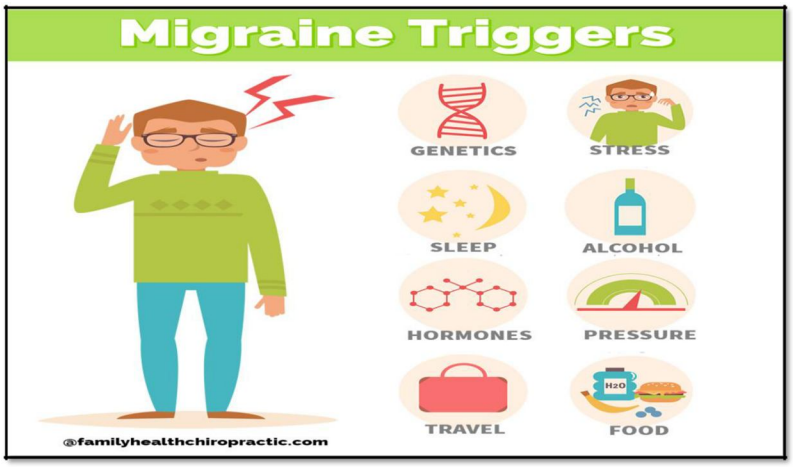
III. CAUSE OF MIGRAINE

Headaches can be cause by dehydration, stress and hormonal change during menstruation, pregnancy and menopause. Lifestyle and environmental factors that can cause headaches include bright light, strong odors, loud noises, insufficient sleep, poor posture, staring at computer, T.V. or phone screen for extended periods of time and lack of exercise.

Though migraine causes aren't fully understood, genetics and environmental factors appear to play a role. Changes in the brainstem and its interactions with the trigeminal nerve, a major pain pathway, might be involved. So might imbalances in brain chemicals — including serotonin, which helps regulate pain in your nervous system. Researchers are studying the role of serotonin in migraines. Other neurotransmitters play a role in the pain of migraine, including Calcitonin Gene-Related Peptide (CGRP).

IMG.06 - Headache Symptoms

A. Migraine Triggers

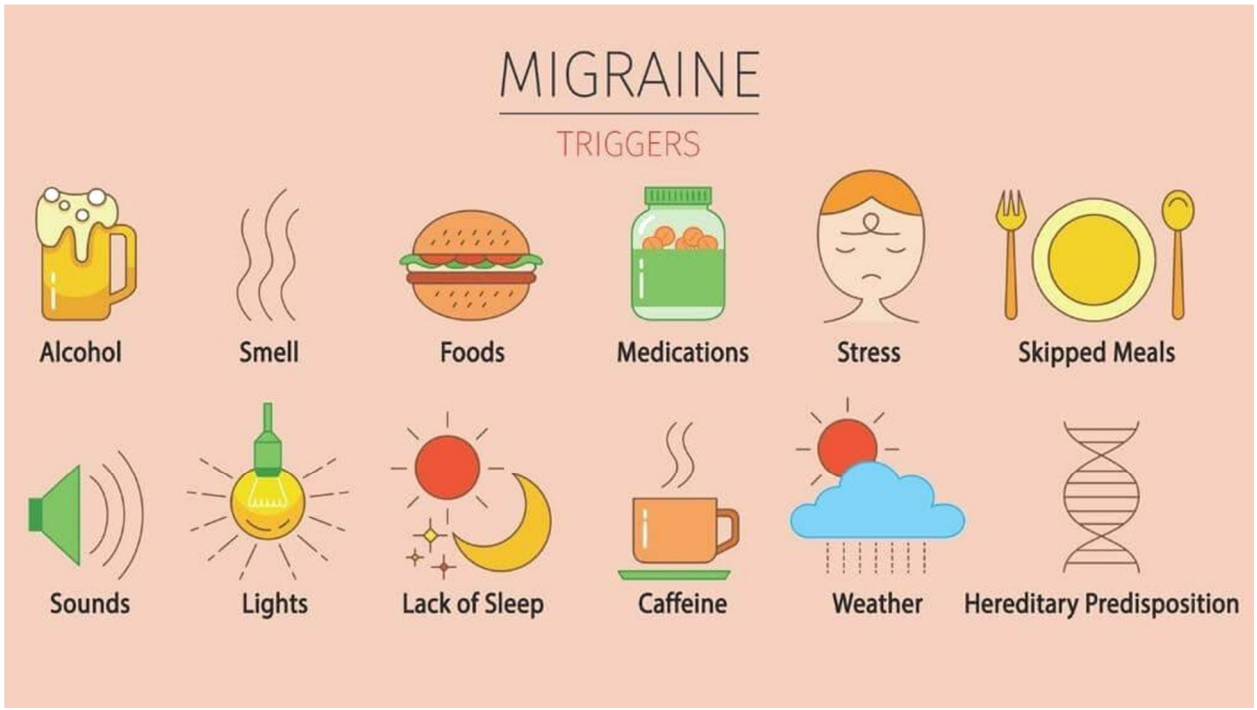


IMG.07 –Migraine Trigger

There are a number of migraine triggers, including:

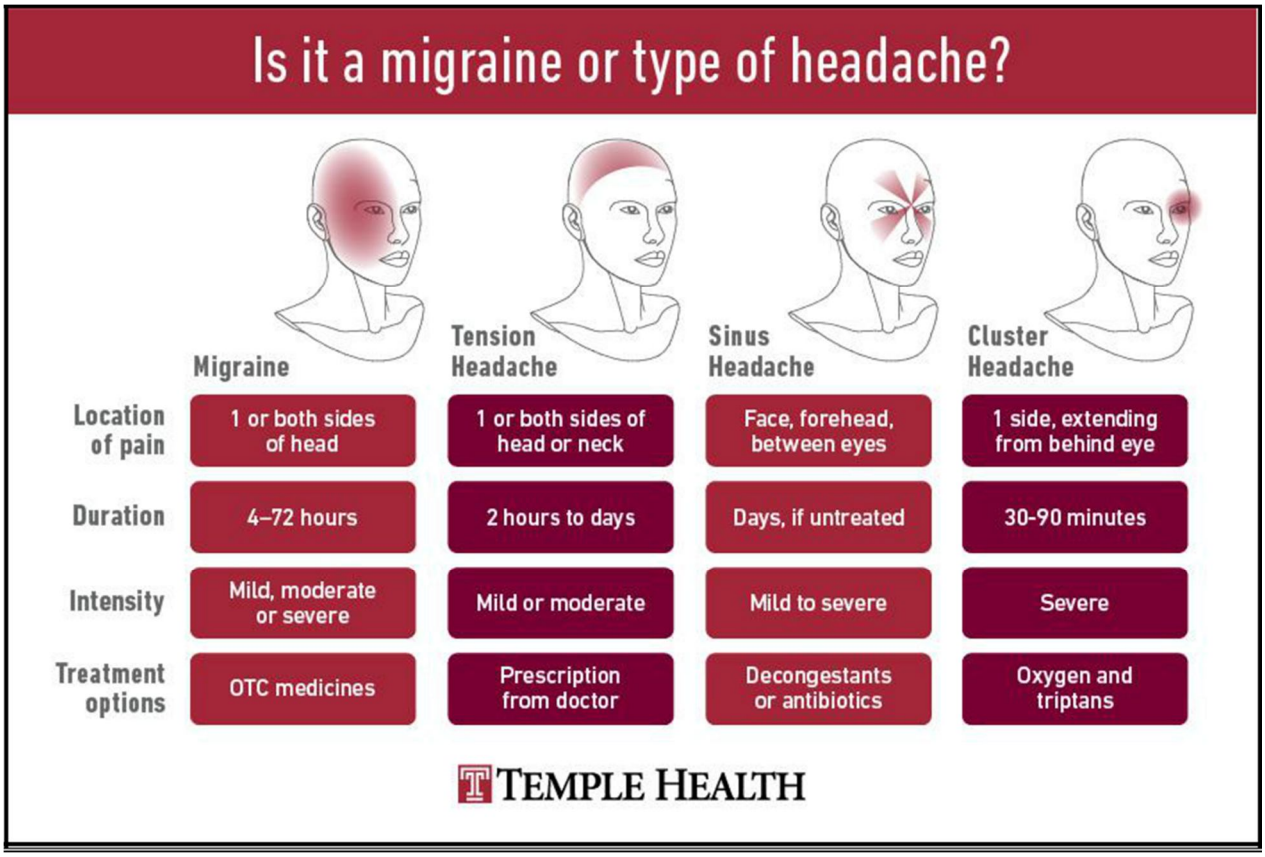
1) *Hormonal Changes in Women:* These headaches are directly linked to your hormone levels and occur during times when hormones are in flux (i.e., menstruation, pregnancy, and menopause). They can be similar to migraines and cause severe pain, nausea, and sensitivity to light and sound.

2) *Drinks:* These include alcohol, especially win and too much caffeine, such as coffee
3) *Stress:* Stress at work or home can cause migraines.
4) *Sensory Stimuli:* Bright or flashing lights can induce migraines, as can loud sounds. Strong smells — such as perfume, paint thinner, secondhand smoke and others — trigger migraines in some people.
5) *Sleep Changes:* Missing sleep or getting too much sleep can trigger migraines in some people.
6) *Physical Factors:* Intense physical exertion, including sexual activity, might provoke migraines.
7) *Weather Changes:* A change of weather or barometric pressure can prompt a migraine.
8) *Medications:* Oral contraceptives and vasodilators, such as nitroglycerin, can aggravate migraines.
9) *Foods:* Aged cheeses and salty and processed foods might trigger migraines. So might skipping meals.
10) *Food Additives:* These include the sweetener aspartame and the preservative monosodium glutamate (MSG), found in many foods.



IMG.08 – Migraine Triggers

IV. TYPE OF MIGRAINE



IMG.09 – Type of Migraine

1) *Migraine Without Aura (Common Migraine):* Most people with migraines have common migraines. This type of migraine causes a throbbing pain on one side of the head. The pain is moderate to severe and gets worse with normal physical activity. You also may have nausea and vomiting and may feel worse around light and sound. The headache lasts 4 to 72 hours if it is not treated. A common migraine doesn't begin with an aura.

IMG.10 - Migraine Without Aura

2) *Migraine with Aura (Classic Migraine):* Some people with migraines get an aura up to 30 minutes before they have a migraine. Symptoms of the aura include seeing wavy lines, flashing lights, or objects that look distorted. Other symptoms include tingling or a "pins-and-needles" feeling.

Other types of migraine headache include:

IMG.11 – Migraine with Aura

3) *Menstrual Migraine:* Many women have migraines around their menstrual cycle. These occur a few days before, during, or right after their period. The symptoms are the same as those of common or classic migraines.

IMG.12 – Menstrual Migration

4) *Migraine Equivalent:* Migraine equivalent is a migraine aura that is **not** followed by a headache. This form of migraine often happens after age 50 if you had migraines with aura when you were younger. The symptoms may include streaks or points of light moving across your field of vision.

IMG.13 – Migraine Equivalent

5) *Complicated Migraine:* These are migraines that cause symptoms such as numbness and tingling, trouble speaking or understanding speech, or not being able to move an arm or leg. These symptoms go on after the headache goes away.

IMG.14 – Complicated Migraine

6) *Abdominal Migraine:* These migraines usually occur in children. The symptoms include vomiting or dizziness, without a throbbing headache. The symptoms may occur about once a month.

IMG.15 –Abdominal Migraine

V. MIGRAINE LOCATION

A migraine is usually an intense pounding headache that can last for hours or even days. The pounding or pulsing pain usually begins in the forehead, the side of the head, or around the eyes.

IMG.16 - Migraine Location

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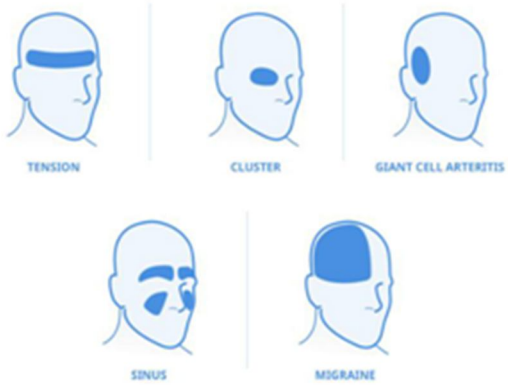


A. Common Headache Types by Location

The headaches people usually get are tension headaches, migraines, and cluster headaches. Cluster headaches don't happen as often, but men are five times more likely to get them.

Pain location	Most common cause	Other possible causes
Back of your head or neck	Tension headache Migraine	Arthritis in your upper spine Occipital neuralgia
Top of your head "Hair band" area	Tension headache	Migraine Occipital neuralgia Severe hypertension (rare) Aneurysm or bleeding, called a hemorrhagic stroke (rare)
Forehead Cheeks Behind both eyes	Tension headache Migraine	Cluster headache Sinus infection Migraine
Behind one eye	Cluster headache	Occipital neuralgia Eye infection Aneurysm (rare) Migraine
Temples	Tension headache	Cluster headache Temporal arteritis (more common in the elderly) Temporomandibular joint (TMJ) disorder

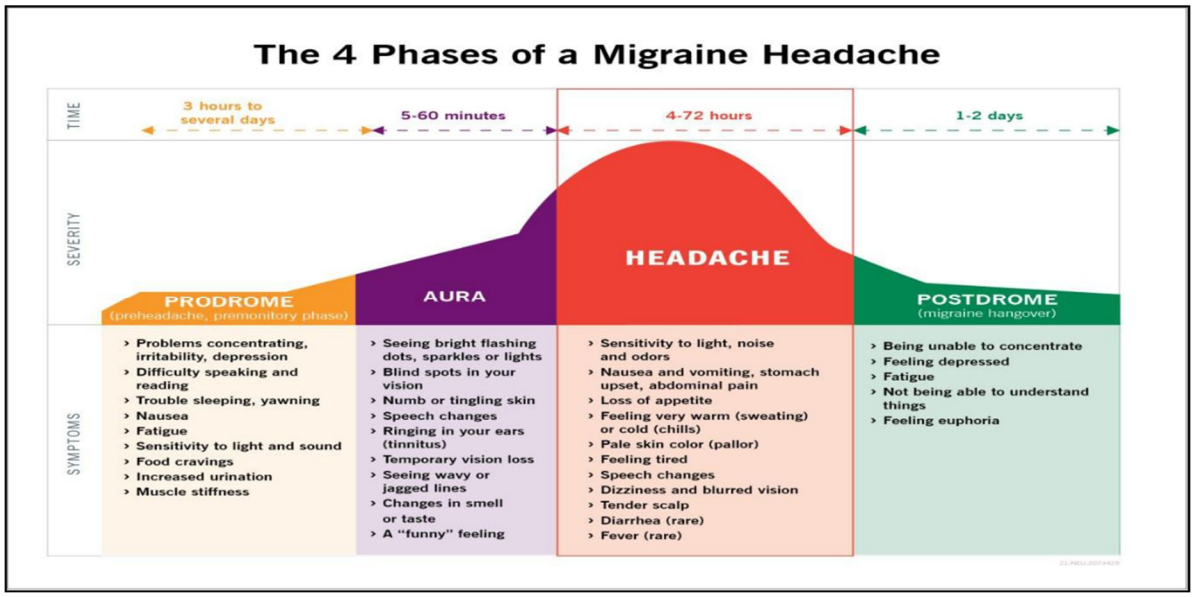
Behind the ear	Ear infection (more common in children)	Occipital neuralgia Sinus infection Temporomandibular joint (TMJ) disorder Dental problems Mastoiditis
On one side of your head	Migraine Cluster headache	Hemicrania continua (rare) [redacted] Aneurysm (rare)
Not sure Hurts all over	Tension headache	Migraine Sinus infection

VI. PHARMACOLOGY OF MIGRAINE

The drugs used in migraine therapy can be divided into two groups: agents that abort an established migraine attack and agents used prophylactically to reduce the number of migraine attacks. Both groups have drugs that are specific for migrainous headaches and that are non-specific, and are used to treat the accompanying headache (analgesics), vomiting (anti-emetics), anxiety (sedatives and anxiolytics), or depression (antidepressants). The main drugs with specific action on migraine include ergot alkaloids (ergotamine, dihydroergotamine), agonists (sumatriptan) or partial agonists (methysergide) at a specific subtype of 5-HT1-like receptors, beta-adrenoceptor antagonists (propranolol, metoprolol), calcium antagonists (flunarizine) and anti-inflammatory agents (indomethacin).
The pharmacological basis of therapeutic action of several of these drugs is not well understood. In the case of the ergot alkaloids and 5-HT1-like receptor agonists, however, it is likely that the antimigraine effect is related to the potent and rather selective constriction of the large arteries and arteriovenous anastomoses in the scalp and dural regions. In addition, these drugs inhibit plasma extravasation into the dura in response to trigeminal ganglion stimulation, but it is possible that this effect is related to the selective vasoconstriction in the extracerebral vascular bed. The selectivity of the pharmacological effects of these antimigraine drugs (constriction of the extracerebral arteries and arteriovenous anastomoses, poor penetration into the central nervous system and the absence of an antinociceptive effect even after intrathecal administration) strongly suggests that excessive dilatation in the extracerebral cranial vasculature, probably initiated by a neuronal event, is an integral part of the pathophysiology of migraine

VII. TREATMENT OF MIGRAINE

Many people who have migraines find that over-the-counter painkillers, such as paracetamol, aspirin and ibuprofen, can help to reduce their symptoms. They tend to be most effective if taken at the first signs of a migraine attack, as this gives them time to absorb into your bloodstream and ease your symptoms.



IMG.17 – Treatment Of Migraine

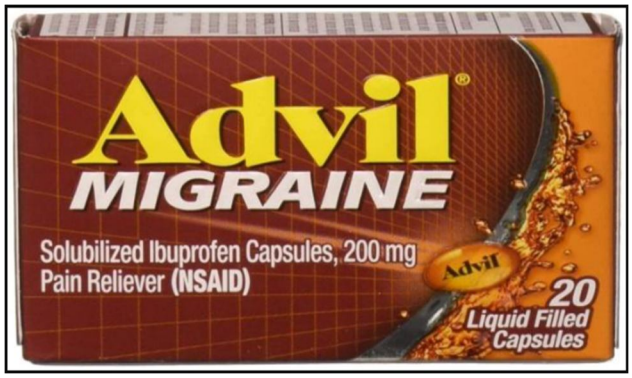
A. *First Treatment*

Acetaminophen and nonsteroidal anti-inflammatory drugs are first-line treatments for mild to moderate migraines, whereas triptans are first-line treatments for moderate to severe migraines.

IMG.18 – First Treatment

B. *Best Treatment*

Many people who have migraines find that over-the-counter painkillers, such as paracetamol, aspirin and ibuprofen, can help to reduce their symptoms. They tend to be most effective if taken at the first signs of a migraine attack, as this gives them time to absorb into your bloodstream and ease your symptoms.



IMG.19 - Ibuprofen

C. *Diagnosis*

If you have migraines or a family history of migraines, a doctor trained in treating headaches (neurologist) will likely diagnose migraines based on your medical history, symptoms, and a physical and neurological examination.

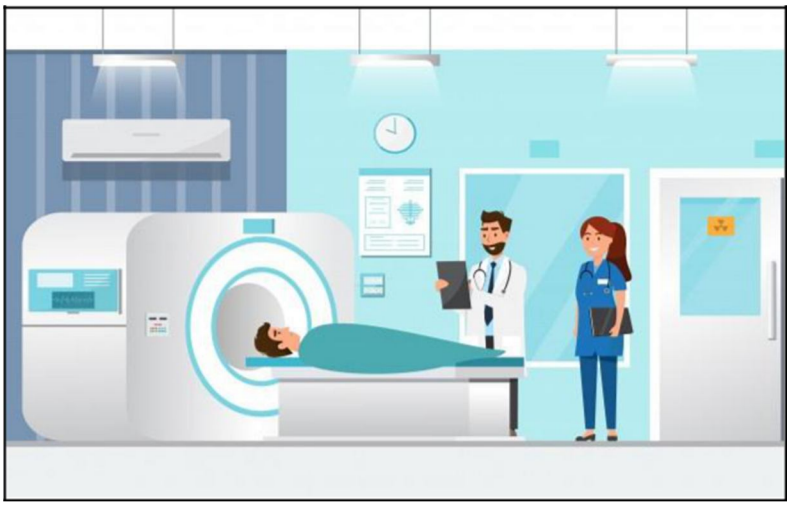
IMG.20 – Diagnosis

If your condition is unusual, complex or suddenly becomes severe, tests to rule out other causes for your pain might include:

1) *Magnetic Resonance Imaging (MRI):* An MRI scan uses a powerful magnetic field and radio waves to produce detailed images of the brain and blood vessels. MRI scans help doctors diagnose tumors, strokes, bleeding in the brain, infections, and other brain and nervous system (neurological) conditions.

IMG.21 – Magnetic Resonance Imaging [MRI]

2) *Computerized Tomography (CT) Scan:* A CT scan uses a series of X-rays to create detailed cross-sectional images of the brain. This helps doctors diagnose tumors, infections, brain damage, bleeding in the brain and other possible medical problems that may be causing headaches.



IMG.22 – Computerized Tomography [CT SCAN]

D. Treatment

Migraine treatment is aimed at stopping symptoms and preventing future attacks.
Many medications have been designed to treat migraines.

Medications used to combat migraines fall into two broad categories:

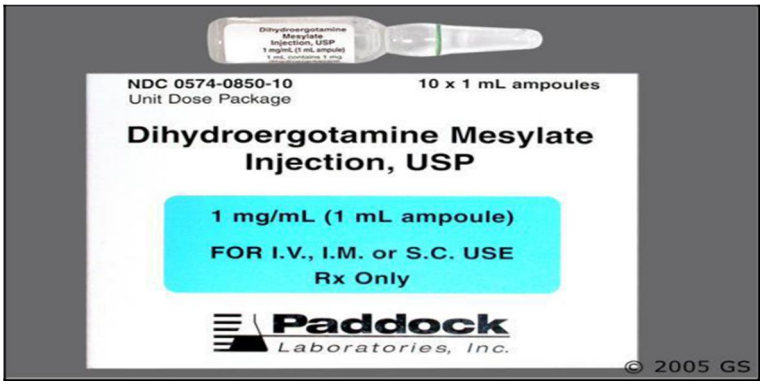
- *Pain-relieving Medications:* Also known as acute or abortive treatment, these types of drugs are taken during migraine attacks and are designed to stop symptoms.
- *Preventive Medications:* These types of drugs are taken regularly, often daily, to reduce the severity or frequency of migraines.

Your treatment choices depend on the frequency and severity of your headaches, whether you have nausea and vomiting with your headaches, how disabling your headaches are, and other medical conditions you have.
Medications for reliefMedications used to relieve migraine pain work best when taken at the first sign of an oncoming migraine — as soon as signs and symptoms of a migraine begin. Medications that can be used to treat it include:

1) *Pain Relievers:* These over-the-counter or prescription pain relievers include aspirin or ibuprofen (Advil, Motrin IB, others). When taken too long, these might cause medication-overuse headaches, and possibly ulcers and bleeding in the gastrointestinal tract. Migraine relief medications that combine caffeine, aspirin and acetaminophen (Excedrin Migraine) may be helpful, but usually only against mild migraine pain.
2) *Triptans:* Prescription drugs such as sumatriptan (Imitrex, Tosymra) and rizatriptan (Maxalt, Maxalt-MLT) are used to treat migraine because they block pain pathways in the brain. Taken as pills, shots or nasal sprays, they can relieve many symptoms of migraine. They might not be safe for those at risk of a stroke or heart attack.

IMG.25 - Triptans

3) *Dihydroergotamine (D.H.E. 45, Migranal):* Available as a nasal spray or injection, this drug is most effective when taken shortly after the start of migraine symptoms for migraines that tend to last longer than 24 hours. Side effects can include worsening of migraine-related vomiting and nausea. People with coronary artery disease, high blood pressure, or kidney or liver disease should avoid dihydroergotamine.



IMG.26 - Dihydroergotamine

4) *Lasmiditan (Reyvow):* This newer oral tablet is approved for the treatment of migraine with or without aura. In drug trials, lasmiditan significantly improved headache pain. Lasmiditan can have a sedative effect and cause dizziness, so people taking it are advised not to drive or operate machinery for at least eight hours.

IMG.27 - LASMIDITAN

5) *Ubrogepant (Ubrelvy):* This oral calcitonin gene-related peptide receptor antagonist is approved for the treatment of acute migraine with or without aura in adults. It's the first drug of this type approved for migraine treatment. In drug trials, ubrogepant was more effective than placebo in relieving pain and other migraine symptoms such as nausea and sensitivity to light and sound two hours after taking it. Common side effects include dry mouth, nausea and excessive sleepiness. Ubrogepant should not be taken with strong CYP3A4 inhibitor drugs.

IMG.28 - Ubrogepant

6) *CGRP Antagonists:* Ubrogepant (Ubrelvy) and rimegepant (Nurtec ODT) are oral CGRP antagonists recently approved for the treatment of acute migraine with or without aura in adults. In drug trials, drugs from this class were more effective than placebo in relieving pain and other migraine symptoms such as nausea and sensitivity to light and sound two hours after taking it. Common side effects include dry mouth, nausea and excessive sleepiness. Ubrogepant and rimegepant should not be taken with strong CYP3A4 inhibitor drugs.

IMG.29 - Antagonists

7) *Opioid Medications:* For people who can't take other migraine medications, narcotic opioid medications might help. Because they can be highly addictive, these are usually used only if no other treatments are effective.

IMG.30 – Opioid Medication

8) *Anti-nausea Drugs:* These can help if your migraine with aura is accompanied by nausea and vomiting. Anti-nausea drugs include chlorpromazine, metoclopramide (Reglan) or prochlorperazine (Compro). These are usually taken with pain medications. Some of these medications are not safe to take during pregnancy. If you're pregnant or trying to get pregnant, don't use any of these medications without first talking with your doctor.

IMG.31 – ANTI-NAUSEA Drug

E. Preventive Medications

Medications can help prevent frequent migraines. Your doctor might recommend preventive medications if you have frequent, long-lasting or severe headaches that don't respond well to treatment.

Preventive medication is aimed at reducing how often you get a migraine, how severe the attacks are and how long they last. Options include:

1) *Blood Pressure-Lowering Medications:* These include beta blockers such as propranolol (Inderal, InnoPran XL, others) and metoprolol tartrate (Lopressor). Calcium channel blockers such as verapamil (Verelan) can be helpful in preventing migraines with aura.

IMG.32 – Blood Pressure Lowering Medication

2) *Antidepressants:* A tricyclic antidepressant (amitriptyline) can prevent migraines. Because of the side effects of amitriptyline, such as sleepiness, other antidepressants might be prescribed instead.

IMG.33 - Antidepressants

3) *Anti-seizure Drugs:* Valproate and topiramate (Topamax, Qudexy XR, others) might help if you have less frequent migraines, but can cause side effects such as dizziness, weight changes, nausea and more. These medications are not recommended for pregnant women or women trying to get pregnant.

IMG.34 – ANTI-SEIZURE Drug

4) *Botox Injections:* Injections of onabotulinumtoxinA (Botox) about every 12 weeks help prevent migraines in some adults.

IMG.35 – Botox Injection

5) *CGRP Monoclonal Antibodies:* Erenumab-aooe (Aimovig), fremanezumab-vfrm (Ajovy), galcanezumab-gnlm (Emgality), and eptinezumab-jjmr (Vyepti) are newer drugs approved by the Food and Drug Administration to treat migraines. They're given monthly or quarterly by injection. The most common side effect is a reaction at the injection site.

IMG.36 – Monoclonal Antibodise

F. Lifestyle and Home Remedies

When symptoms of migraine start, try heading to a quiet, darkened room. Close your eyes and rest or take a nap. Place a cool cloth or ice pack wrapped in a towel or cloth on your forehead and drink lots of water.

These practices might also soothe migraine pain:

1) *Try Relaxation Techniques:* Biofeedback and other forms of relaxation training teach you ways to deal with stressful situations, which might help reduce the number of migraines you have.

IMG.37 – Relax

2) *Develop a Sleeping and Eating Routine:* Don't sleep too much or too little. Set and follow a consistent sleep and wake schedule daily. Try to eat meals at the same time every day.

IMG.38 - Routine

3) *Drink Plenty of Fluids:* Staying hydrated, particularly with water, might help.

IMG.39 – Drink Plenty of Fluids

4) *Keep a Headache Diary:* Recording your symptoms in a headache diary will help you learn more about what triggers your migraines and what treatment is most effective. It will also help your doctor diagnose your condition and track your progress in between visits.

IMG.40 - Doctor

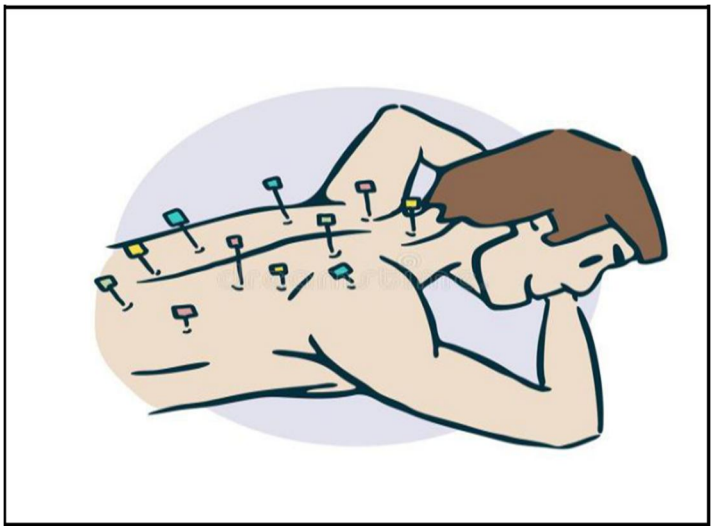
5) *Exercise Regularly:* Regular aerobic exercise reduces tension and can help prevent a migraine. If your doctor agrees, choose aerobic activity you enjoy, such as walking, swimming and cycling. Warm up slowly, however, because sudden, intense exercise can cause headaches. Regular exercise can also help you lose weight or maintain a healthy body weight, and obesity is thought to be a factor in migraines.

IMG.40 – Exercise

G. Alternative Medicine

Nontraditional therapies might help with chronic migraine pain.

1) *Acupuncture:* Clinical trials have found that acupuncture may be helpful for headache pain. In this treatment, a practitioner inserts many thin, disposable needles into several areas of your skin at defined points.



IMG.41 - Acupuncture

2) *Biofeedback:* Biofeedback appears to be effective in relieving migraine pain. This relaxation technique uses special equipment to teach you how to monitor and control certain physical responses related to stress, such as muscle tension.

IMG.42 - Biofeedback

3) *Cognitive Behavioral Therapy:* Cognitive behavioral therapy may benefit some people with migraines. This type of psychotherapy teaches you how behaviors and thoughts affect how you perceive pain.

IMG.43 – Cognitive Behavioral Therapy

4) *Meditation and Yoga:* Meditation may relieve stress, which is a known trigger of migraines. Done on a regular basis, yoga may reduce the frequency and duration of migraines.

IMG.44 – Yoga and Meditation

5) *Herbs, Vitamins and Minerals:* There is some evidence that the herbs feverfew and butterbur might prevent migraines or reduce their severity, though study results are mixed. Butterbur isn't recommended because of safety concerns.

IMG.45 – Herbs, Vitamins And Minerals

VIII. CONCLUSION

Migraine is an extremely prevalent and disabling neurologic disorder that manifests as periodic attacks of severe head pain and is accompanied by associated symptoms of interference with activity, nausea/vomiting, and sensitivity to light and sound.

Migraine is a disorder associated with significant psychosocial impact. The diagnosis of migraine requires a good clinical history, and exclusion of other causes of headache. However, further investigations are needed when the findings from the history and clinical examination are atypical of migraine, or if there is a recent change in the character of the patient's headaches. Current pharmaceutical anti-migraine treatments have revolutionized migraine management. Optimal treatment needs to be individualized, taking into consideration side effects of medications, duration and severity of symptoms, and outcome of previous treatments.

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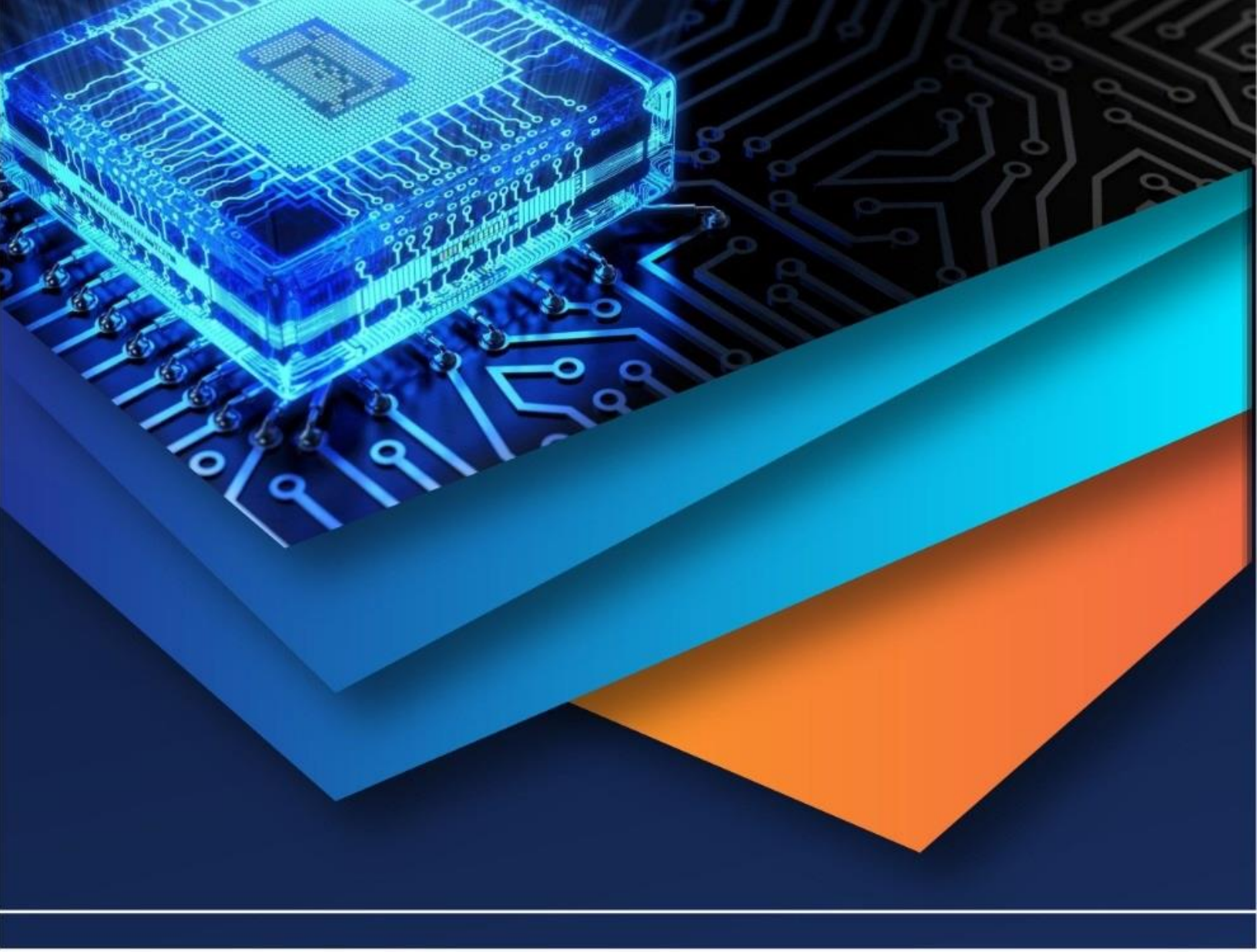

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