CONDITION

Cluster headache

Learn how cluster headaches cause repeated severe one-sided head pain, how doctors diagnose them, and which treatments may stop attacks or prevent a cluster period.

WHAT IT IS
Neurological condition causing repeated severe one-sided headaches

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
One-sided head pain, watery eye, runny nostril, restlessness

WHAT CAUSES IT
Not fully understood

HOW IT IS DIAGNOSED
Attack pattern and neurological examination

MAIN TREATMENT
Attack-stopping and preventive treatments

CAN IT BE CURED?
No, treatments stop or prevent attacks

IS IT AN EMERGENCY?
Sometimes, sudden worst-ever headache

LONG-TERM OUTLOOK
Remissions can last years or attacks can become chronic

Overview

Cluster headache is a neurological condition that causes repeated attacks of severe pain on one side of the head. The pain is usually centered around or behind one eye. Attacks also cause symptoms on the same side of the face, such as a watery eye, a stuffy or runny nostril, or a drooping eyelid.

Cluster headache belongs to a group of conditions called trigeminal autonomic cephalalgias. "Trigeminal" refers to a major nerve that carries sensation from the face. "Autonomic" refers to automatic body functions, including tearing and nasal congestion.

The name comes from the pattern of attacks. Headaches often occur in a series, or cluster period, lasting weeks or months. During that period, a person may have attacks at similar times each day. Remission periods without attacks can last months or years.

In episodic cluster headache, cluster periods are separated by remissions lasting at least three months. In chronic cluster headache, attacks continue for a year or longer without remission, or remissions last less than three months. A clinician must review the pattern before applying either term.

Cluster headache is different from migraine, although both can cause severe one-sided pain. People with migraine often prefer to lie still in a dark room. During a cluster attack, people are more likely to feel restless, pace, rock, or press on the painful area.

The condition does not usually damage the brain. However, the intense pain, repeated attacks, and sleep disruption can seriously affect work, relationships, and emotional health. Prompt diagnosis matters because treatments used for many other headaches may act too slowly to help a cluster attack.

Symptoms

A cluster headache attack typically begins quickly and reaches full intensity within minutes. Without treatment, an attack usually lasts from 15 minutes to three hours. Attacks may occur from once every other day to as often as eight times in one day.

The main symptom is severe or very severe pain on one side of the head. It is commonly felt around, above, or behind one eye or at the temple. The pain is often described as sharp, burning, boring, or piercing. It usually stays on the same side during a cluster period, although the affected side can change in some people.

At least one of the following commonly occurs on the painful side:

Restlessness or agitation is also characteristic. A person may be unable to sit or lie still. Nausea, sensitivity to light, and sensitivity to sound can occur, but they are usually less prominent than in migraine.

Attacks often follow a predictable schedule. They may happen at the same time each night and wake a person from sleep. Some cluster periods occur around the same season each year.

A first episode of sudden, severe headache should not be assumed to be cluster headache. Other conditions can produce similar pain and may need urgent assessment.

- A red or watery eye
- A stuffy or runny nostril
- Swelling around the eye
- Eyelid drooping

- A smaller pupil
- Facial or forehead sweating
- Facial flushing
- A feeling of fullness in the ear

Causes and risk factors

The exact cause of cluster headache is not fully understood. Research points to abnormal activity in brain networks involving the hypothalamus. This area helps regulate sleep, biological rhythms, hormones, and other automatic functions. Its involvement may help explain why attacks often follow daily or seasonal patterns.

During an attack, pathways involving the trigeminal nerve and the autonomic nervous system become active. This can produce both severe pain and same-sided eye or nasal symptoms. Cluster headache is not caused by eye strain, sinus infection, or a mental health condition.

Risk factors and associations include:

Certain exposures may trigger an attack during an active cluster period. Alcohol is a common example. Strong odors, solvents, overheating, disrupted sleep, and medicines that widen blood vessels may trigger some people. These exposures generally do not explain why the underlying condition developed, and they may cause no problem during remission.

- Family history: Cluster headache sometimes runs in families, although most affected people do not have a close relative with it.
- Sex: It is diagnosed more often in men, but people of any sex can develop it.
- Smoking: Many people with cluster headache currently smoke or smoked in the past. This association does not prove that smoking directly causes the condition.
- Age: It often begins in adulthood, but onset can occur at other ages.

Diagnosis

There is no single blood test or scan that confirms cluster headache. Diagnosis is based mainly on the attack pattern, pain location and duration, associated symptoms, and findings from a neurological examination.

A clinician may ask about:

A headache diary can help. Record the start time, duration, side of the pain, associated

symptoms, possible triggers, and treatment response. This information may reveal a pattern and help a clinician assess whether preventive treatment is working.

Cluster headache can resemble migraine and some facial nerve pain conditions. Eye disease, blood vessel problems, infection, inflammation, tumors, and disorders involving the pituitary gland can occasionally produce similar symptoms. A clinician may order magnetic resonance imaging, or MRI, especially for a first presentation, an unusual pattern, abnormal examination findings, or symptoms that do not fit typical cluster headache. Additional tests depend on the individual situation.

Seek emergency care for a headache that reaches maximum intensity within seconds or a few minutes, especially if it is new. Emergency assessment is also appropriate when headache occurs with fainting, seizure, confusion, fever and stiff neck, new weakness or numbness, trouble speaking, major vision loss, or after a significant head injury. These features are not typical of an uncomplicated cluster attack.

- How quickly the pain starts
- How long each untreated attack lasts
- How often attacks occur
- Whether the pain is always on the same side
- Eye, eyelid, nasal, or facial symptoms
- Restlessness during an attack
- Seasonal, sleep-related, or daily timing
- Possible triggers and previously tried treatments
- Other health conditions and medicines

Treatment and management

Treatment has two main goals: stopping individual attacks and reducing attacks during the cluster period. Because attacks become severe quickly, a written plan and ready access to treatment are important.

Stopping an attack

High-flow, 100% oxygen delivered through a non-rebreather mask can stop or reduce an attack for many people. A non-rebreather mask fits over the nose and mouth and has a reservoir bag that helps deliver a high concentration of oxygen. A clinician must prescribe the equipment and explain how to use it.

Oxygen should be used only as directed. It supports combustion, so it must be kept away from smoking, flames, candles, and other ignition sources. Safe storage and handling are essential.

Fast-acting triptans are another standard option. Triptans are medicines that act on serotonin pathways involved in headache. For cluster headache, an injection under the skin or a nasal preparation may work quickly enough. Tablets are generally too slow for a short, rapidly escalating attack.

Triptans are not appropriate for everyone, including some people with heart or blood vessel disease. A clinician should review medical history, other medicines, and the safe frequency of use.

Common pain relievers such as acetaminophen, aspirin, and nonsteroidal anti-inflammatory drugs like ibuprofen or naproxen usually act too slowly to stop a cluster attack. Opioids like oxycodone or morphine are not recommended as routine treatment because they are generally ineffective for this pattern and carry important risks.

Preventing attacks

Preventive treatment is often started early in a cluster period. Verapamil, a medicine also used for blood pressure and heart rhythm conditions, is a widely used preventive treatment. It can affect the heart's electrical conduction, so electrocardiograms, also called ECGs or EKGs, may be needed before and during treatment changes.

Because preventive medicines may take time to work, a clinician may offer short-term transitional treatment. Options can include a corticosteroid course or an injection near the greater occipital nerve at the back of the head. Corticosteroids like prednisone or hydrocortisone are not usually used as a long-term preventive treatment because repeated or prolonged exposure can cause significant side effects.

Galcanezumab, a medicine that targets calcitonin gene-related peptide, is approved in the United States for the treatment of episodic cluster headache during an active cluster period. Evidence and regulatory approval differ for chronic cluster headache and by country.

Specialists may consider other preventive medicines, such as lithium or topiramate, in selected cases. These treatments require review of possible side effects, interactions, pregnancy considerations, and monitoring needs. Noninvasive vagus nerve stimulation may also be an option for some people, depending on headache type, local approval, and access.

For difficult-to-treat cluster headache, a headache specialist can review the diagnosis, optimize treatment timing, and discuss device-based or procedural options. Invasive procedures are generally reserved for carefully selected cases.

During an active cluster period, avoiding alcohol may prevent triggered attacks. Regular sleep may also help some people. Stopping smoking benefits overall health, but it should not be

presented as a guaranteed way to end cluster headache.

Medicines commonly used for this include dihydroergotamine . Which one suits you, if any, is a decision for you and your doctor.

Complications

Cluster headache does not usually cause lasting neurological damage. Its main complications come from uncontrolled attacks, disrupted sleep, reduced ability to work or drive safely, and the effects of treatment.

Repeated severe attacks can contribute to anxiety, depression, social withdrawal, or fear of the next attack. The pain has also been associated with suicidal thoughts in some people. Anyone who feels at risk of self-harm should seek immediate help through local emergency services or a crisis service.

Medicines can cause side effects or interact with other treatments. Preventive treatment should not be started, stopped, or changed without medical guidance. Oxygen equipment also creates a serious fire risk if used near smoking or open flames.

Follow up

Arrange routine follow-up after treatment begins or changes. A clinician can review the headache diary, confirm that acute treatment works quickly enough, check for side effects, and decide how long preventive treatment should continue. Monitoring may include ECGs or blood tests, depending on the medicine.

Contact the treating clinician sooner if attacks are becoming more frequent, lasting longer, changing sides or character, or no longer responding to the usual plan. A return of attacks after remission also deserves review because treatment may need to restart promptly.

Seek urgent medical advice for a new or substantially different headache, new persistent symptoms between attacks, or an eye that remains red and painful with vision changes.

Call emergency services for a sudden "worst-ever" headache, loss of consciousness, seizure, confusion, weakness, trouble speaking, severe vision loss, fever with neck stiffness, or thoughts of immediate self-harm. These situations are different from routine cluster headache follow-up.

Sources

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