

Diagnosis, assessment and management of headache

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Headache is a common presentation in primary care, but assessment and treatment can be complex. This article provides an overview of the current guidelines on diagnosis and management of headache and migraine, with an emphasis on a patient-centred approach.

Headache is a common symptom seen in primary care and represents up to 30 per cent of neurology referrals.¹⁻³ Primary and secondary headache disorders have been classified by the International Headache Society (IHS) and this can be used as a basis for headache diagnosis (see Table 1).^{4,5} The IHS classification is an expansive document, with the International Classification of Headache Disorders, 3rd edn (ICHD-3) beta version having been published in July 2013,⁶ which can still be modified for use in primary care.

Using the new classification criteria, a primary headache is one in which the characteristics of the headache cannot be attributed to another cause or disorder. A secondary headache is one in which the characteristics of the headache can be attributed to another cause. Using this definition, migraine with or without aura is a primary headache disorder, but medication overuse headache is a secondary headache disorder.

In September 2012, NICE published a guideline: *Headache in Over 12s: Diagnosis and Management*.¹ The guideline focuses on the most common primary headache disorders, which include tension-type headache, migraine and cluster headache, as well as medication overuse headache, which is, by classification, a secondary headache disorder. The document stresses the importance of patient-centred care, that referral for neuroimaging for reassurance is inappropriate, acute treatment needs to reflect the patients' goals and preferences, and that prophylaxis needs to reflect patient preference and co-morbidities.¹

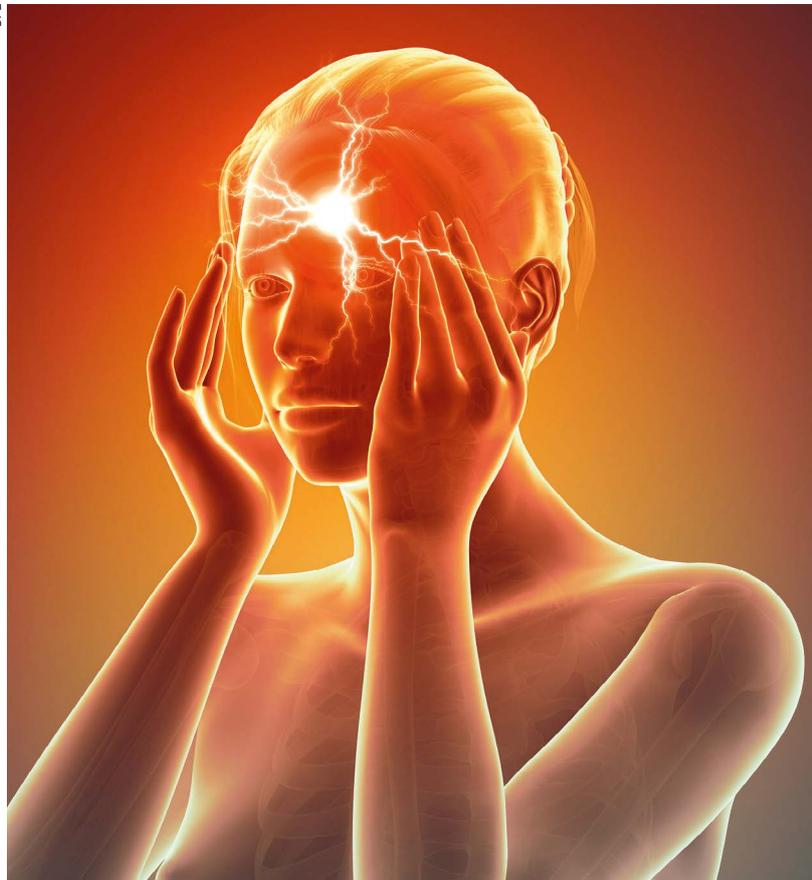
Diagnosis

Pattern recognition

It is important to recognise relevant symptom combinations that suggest common primary headaches or medication overuse headache (see Table 1),^{4,6} as well as recognising red-flag symptoms that suggest a possible secondary cause for the headache and require further investigation (see Table 2).⁷

It must be remembered that when diagnosing migraine, the classification asks for at least two features relating to laterality, quality of pain, severity or change with movement, and one of

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	Migraine with or without aura	Tension-type headache	Cluster headache	Medication-overuse headache
<i>Aura</i>	Yes	No	No	No
<i>Headache duration</i>	4–72 hours	30 minutes to 7 days	15–180 minutes	Some or all of the day
<i>Frequency</i>	Episodic, variable	1–15 days per month, variable	1 on alternate days to 8 per day, often for 7 days to 1 year when episodic	Daily >15 days each month, for more than 3 months
<i>Laterality</i>	Unilateral	Bilateral	Unilateral	Unilateral/bilateral
<i>Character of pain</i>	Pulsating	Pressing/tightening	Knife-like, severe, excruciating	Pressing/tightening/pulsating
<i>Severity of pain</i>	Moderate/severe	Mild/moderate	Severe/very severe	Mild/moderate/severe
<i>Aggravated by movement</i>	Yes – need to be still	No	No	No
<i>Eased by movement</i>	No	No	Yes – tendency to be restless	No
<i>Nausea +/- vomiting</i>	Yes	No	No	No
<i>Photophobia/phonophobia</i>	Yes	No	No	No
<i>Red, watery eye</i>	No	No	Yes	No
<i>Watery or blocked nose</i>	No	No	Yes	No

Table 1. Important headache types and their diagnostic features (adapted from International Headache Society classification)⁴⁻⁶

nausea/vomiting or photo/phonophobia, with a similar level of awareness of flexibility with regard to the features of the other headaches and the need to understand the headache phenotype.

Making a diagnosis in a 10-minute GP consultation

It is possible to make a rapid assessment by asking a series of questions that will help you distinguish between a headache with associated features and one without (see Figure 1). It is useful to understand whether this is a new headache to the patient, or whether they have had a similar headache in the past. The next step is to exclude any possible red-flag symptoms⁷ (see Table 2). A more detailed assessment will enable a diagnosis to be made and then treatment options can be discussed with the patient.

NICE guidance on migraine

Acute treatment

Decision-making with regard to treatment options is complex as the patient needs to understand how each drug or drug combination works, as well as what different delivery systems are available to meet the goals they have set for a successful treat-

ment outcome. Patients often make choices about treatment that relate to their needs at any one time, and so the options available should reflect the flexibility that they need.

A simple analgesic and prokinetic antiemetic can be taken at the start of the aura, or within one hour of the headache starting, and for some this will be sufficient.^{1,2} If this is not effective then a triptan can be taken at the start of the headache. There is no reason why clinicians should not start with the triptan with the lowest unit cost but if this is not effective then each alternative tried should aim to optimise treatment and minimise disability.^{1,8} The different triptan delivery options, be it oral, orodispersible, nasal spray or injection, should be discussed with the patient (see Table 3). Patients often opt to use different approaches at different times and being able to utilise this flexibility tends to improve treatment outcomes.^{1,2,9}

The individual patient response to any of the seven triptans available in the UK is idiosyncratic and each should be tried in turn on any one patient for three consecutive attacks. The patient needs to be reviewed and assessed to adequately evaluate the treatment response. The questions asked should include:

- How long did it take you to notice a reduction in your headache?
- How long did it take for you to become headache free?
- Did the headache return that day or the next day (headache recurrence)?

It is crucial to optimise the acute treatment of each individual migraine episode to minimise the number of headache days and reduce the risk of medication overuse headache developing. NICE guidance is also quite clear that ergots and opioids should not be used in the acute treatment of migraine.¹

Prophylactic treatment

While the NICE guidance recommends the use of topiramate or propranolol for prophylaxis, patient preference must be considered and this will require a detailed conversation about efficacy, expectation and side-effects. The harder decision is when to introduce prophylaxis as it will not stop all attacks; it will reduce the frequency only, and may make some attacks more responsive to treatment.^{1,2}

British Association for the Study of Headache (BASH) guidance makes it clear that prophylaxis should be used as well as acute treatment, not instead of acute treatment.² They recommend that

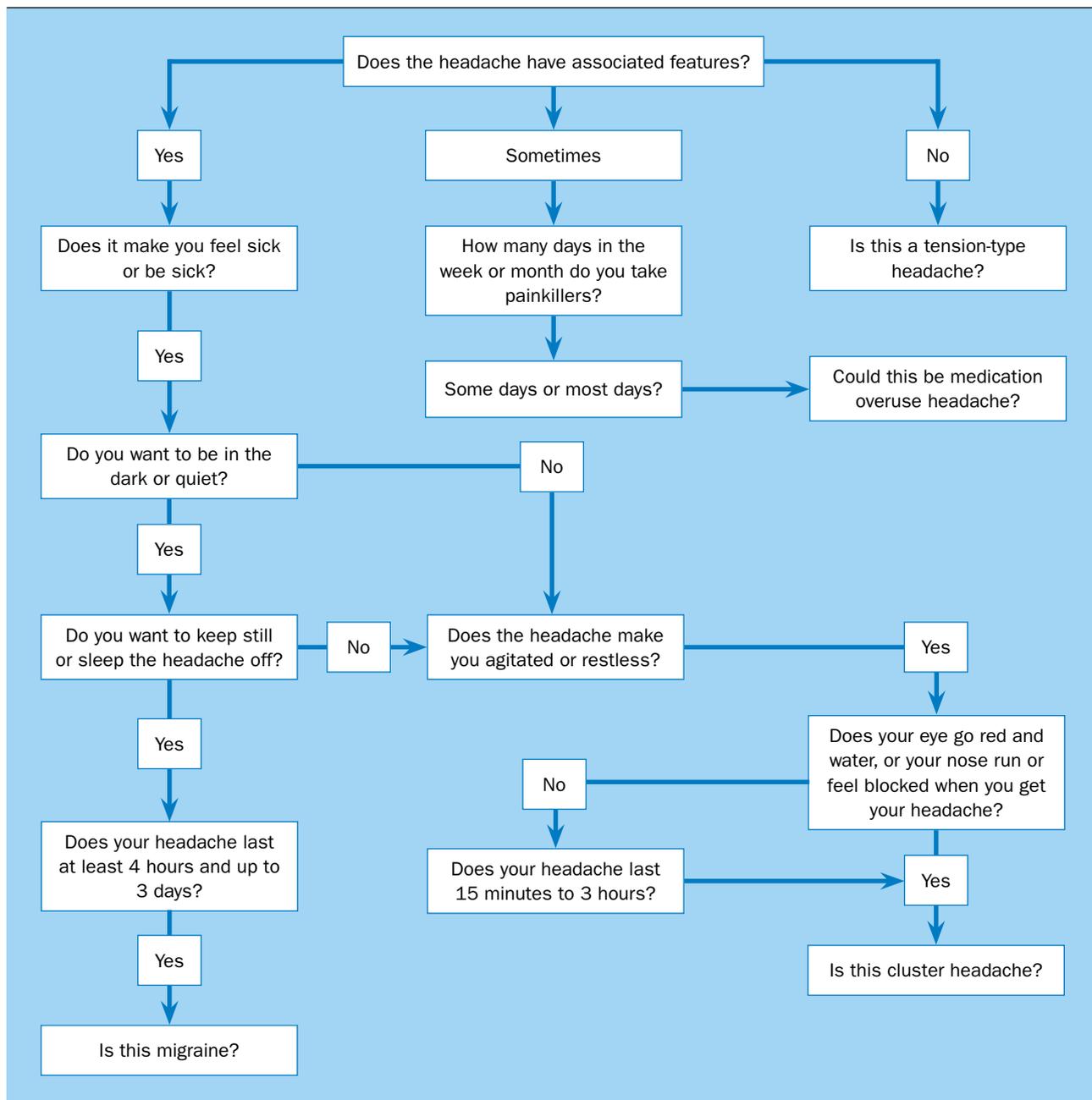


Figure 1. Making a headache diagnosis within a 10-minute consultation

Red-flag symptom	Is it a primary headache?	Is it a secondary headache?
First severe headache in patient over the age of 50 years	<ul style="list-style-type: none"> • Tension-type headache • Migraine 	<ul style="list-style-type: none"> • Temporal arteritis • Mass lesion
A sudden onset that reaches maximum intensity within 5 minutes associated with any Valsalva manoeuvre: <ul style="list-style-type: none"> • cough • sneeze • straining • exercise • intercourse 	<ul style="list-style-type: none"> • Primary cough headache • Primary exertional headache • Primary coital headache 	<ul style="list-style-type: none"> • Subarachnoid haemorrhage • Pituitary apoplexy • Bleed into a mass lesion
Accelerating pattern of headache. Check for: <ul style="list-style-type: none"> • recent head injury in last 3 months 		<ul style="list-style-type: none"> • Medication overuse headache • Mass lesion • Subdural haematoma
Headache associated with fever. Check for compromised immunity: <ul style="list-style-type: none"> • HIV infection • immunosuppressive drugs 	<ul style="list-style-type: none"> • Systemic infection 	<ul style="list-style-type: none"> • Meningitis • Encephalitis • Abscess
Focal neurological signs or symptoms. Check for: <ul style="list-style-type: none"> • cognitive dysfunction • change in personality • history of malignancy that can metastasise to brain 	<ul style="list-style-type: none"> • Migraine with aura 	<ul style="list-style-type: none"> • Stroke • Mass lesion • Vascular malformation
Headache with papilloedema on examination	<ul style="list-style-type: none"> • Idiopathic intracranial hypertension 	<ul style="list-style-type: none"> • Mass lesion
Headache associated with a red eye	<ul style="list-style-type: none"> • Trigeminal autonomic cephalalgia 	<ul style="list-style-type: none"> • Acute glaucoma

Table 2. Investigating red-flag symptoms: is it a primary headache or is there a secondary cause?

propranolol be used first-line, with topiramate second-line if migraine exists in isolation.² Interestingly, if topiramate or propranolol is not effective or unsuitable then the NICE guidance recommends considering up to 10 sessions of acupuncture over five to eight weeks.¹

BASH guidance recommends the use of amitriptyline if migraine occurs “in the presence of tension-type headache, another chronic pain condition, disturbed sleep or depression”.² Additional advice, based on personal experience, should include start low, build slow and to take the medication two hours before bedtime or 12 hours before the patient wants to get up.

NICE guidance on cluster headache

Acute treatment

The NICE recommendation is to offer oxygen or a triptan for the treatment of an individual episode of cluster headache pain, recognising the challenge of treating a headache that can last as little as 15 minutes or as long as three hours. The evidence shows that subcutaneous sumatriptan will give the swiftest response but an intranasal triptan could be considered.¹

NICE recommends the use of 100 per cent oxygen at a flow rate of at least 12 litres per minute using a nonbreathing mask, which will need a special regulator. When arranging the provision of home

oxygen, this information needs to be made explicit on the request form as well as indicating how often the oxygen will be needed in any one day and the duration of each attack to ensure adequate provision of oxygen for the patient.¹ The same principles apply when issuing a prescription for triptans for using during an episode of cluster headache, as up to eight attacks can occur in any one day.¹

Prophylactic treatment of cluster headache

The NICE guidance recommends the use of verapamil for the prophylactic treatment of cluster headache, highlighting the importance of ECG monitoring with higher doses. If there are any concerns about using verapamil or if the patient does not respond, then a specialist opinion is recommended.¹

Supporting the patient with daily headache

Patients who present with a headache most if not every day require careful assessment in order to clarify the diagnosis. Patients with tension-type headache or cluster headache will often experience headache on a daily or near-daily basis. The headache history will allow you to separate one from the other; tension-type headache is not associated with any other features, whereas cluster headache has clear associated symptoms.

Patients often present with increasingly frequent headache or a headache that becomes less and less responsive to the usual acute treatment. In this case, it can be quite difficult to identify the headache profile (see Figure 2).

Supporting the patient with a medication-overuse headache

When a patient presents with daily headache and they are taking regular analgesia to treat it, it takes a careful discussion to explain to the patient that the tablets they are taking are contributing to the problem. The evidence suggests that all analgesia should be stopped.¹ My clinical experience supports this process, but I often suggest the use of a supportive pain-modulating agent such as a suitable tricyclic antidepressant, which

may or may not be combined with an NSAID (usually naproxen, for no longer than two weeks), which can help break the current cycle and reduce the frequency of headache symptoms.

A recent systematic review of the treatment of medication overuse headache supports the view that stopping 'overused' medication with the addition of preventative medication produces the best outcomes.¹⁰ Diary cards can be an invaluable tool as they can demonstrate changes in headache frequency and severity.

Use of botulinum toxin

Botulinum toxin does have a role in the treatment of chronic migraine but not episodic migraine. NICE recommends botulinum toxin type A in adults with chronic migraine in the absence of medication overuse.¹¹ Chronic migraine is defined as having

Triptan by launch date	Dose and delivery system	Indication	Advice and dose recommendation
Sumatriptan	50mg and 100mg tablet	Acute migraine	First visit: try 100mg At review, if side-effects but effective: try 50mg At review, if 50mg but not effective: try alternate delivery system or different triptan
Sumatriptan	10mg and 20mg intranasal spray	Acute migraine	If oral medication not effective or need rapid onset 10mg recommended in adolescents aged 12–17 years
Sumatriptan	6mg subcutaneous injection	Acute migraine Cluster headache	If fast onset needed First line for cluster headache
Zolmitriptan	2.5mg tablet	Acute migraine	First visit: try 5mg At review, if side-effects but effective: try 2.5mg At review, if 2.5mg not effective, try alternate delivery system or different triptan
Zolmitriptan	2.5mg and 5mg orodispersible tablet	Acute migraine	Alternative to standard oral preparations
Zolmitriptan	5mg intranasal spray	Acute migraine Cluster headache	If fast onset needed First line for cluster headache
Naratriptan	2.5mg tablet	Acute migraine	Low side-effect profile
Rizatriptan	5mg and 10mg tablet	Acute migraine	Use 5mg if patient taking propranolol as prophylaxis (shares metabolic pathway) Use 10mg in all other instances, and with other beta-blockers
Rizatriptan	10mg orodispersible tablet	Acute migraine	Alternative to standard oral preparations
Almotriptan	12.5mg tablet	Acute migraine	Low side-effect profile
Eletriptan	20mg and 40mg tablet	Acute migraine	First visit: try 80mg At review, if side-effects but effective: try 40mg At review, if 40mg not effective: try different triptan
Frovatriptan	2.5mg tablet	Acute migraine	Long half-life

Table 3. Triptans preparations, their indications and dose. Adapted from *BNF* (March–September 2016), BASH guidance and NICE guidance

15 headache days or more in a month and at least eight of those must be consistent with migraine. Botulinum toxin type A can only be used if the patient has failed to respond to at least three prior pharmacological therapies and should be stopped if they do not experience at least a 30 per cent reduction in headache days after two treatment cycles or if they have reverted to episodic migraine for three consecutive months.

In my own clinical experience, there is a cohort of patients who do not respond to standard prophylaxis regimens and a proportion of these have received benefit from a course of botulinum toxin type A treatment.

Migraine-associated vertigo or vestibular migraine

Balance symptoms often described as 'dizziness' are commonly experienced during a migraine attack.^{6,12} Patients who have migraine are three times more likely to experience vertigo than patients with tension-type headache. In a population-based study, vertigo was found to occur in 3.2 per cent of migraine patients, which is three times that expected by chance.

The sensation is variously described as spinning, 'to and fro' motion, rocking, floating, and motion sickness with nausea.

The symptoms can occur with or without a headache. The duration of symptoms can vary from seconds, to minutes, hours or days, but the intensity of symptoms can vary during that time. When taking a patient history, there are a variety of features that may increase the probability of a diagnosis of migraine-associated vertigo (see Table 4).¹²

The following conditions need to be excluded by appropriate assessment and investigation:

- Ménière's disease
- benign paroxysmal positional vertigo
- vestibular neuritis
- transient ischaemic attacks or stroke
- panic disorder and anxiety-related dizziness.

Treating this condition is challenging. Propranolol or metoprolol are first-line agents in the absence of contraindications. Acetazolamide, lamotrigine or topiramate have been used in small studies and have shown some benefit. Some patients have shown improvement with vestibular rehabilitation physical therapy, assuming they can tolerate it.¹²

What is new?

In March 2016, NICE published guidance on the use of vagus nerve stimulation for the management of cluster headache and migraine.¹³ The aim is to stimulate the cervical branch of the vagus nerve to relieve pain and reduce the frequency of attacks of migraine and cluster headache. A handheld device is used and the two stimulators are placed in front of the sternocleidomastoid muscle over the carotid artery. The patient is able to control the stimulation strength and should increase it slowly until they can feel muscle contractions under the skin, and continue stimulation for approximately 90 seconds. It has been found to be effective in treating acute attacks and as prophylaxis between attacks.¹³

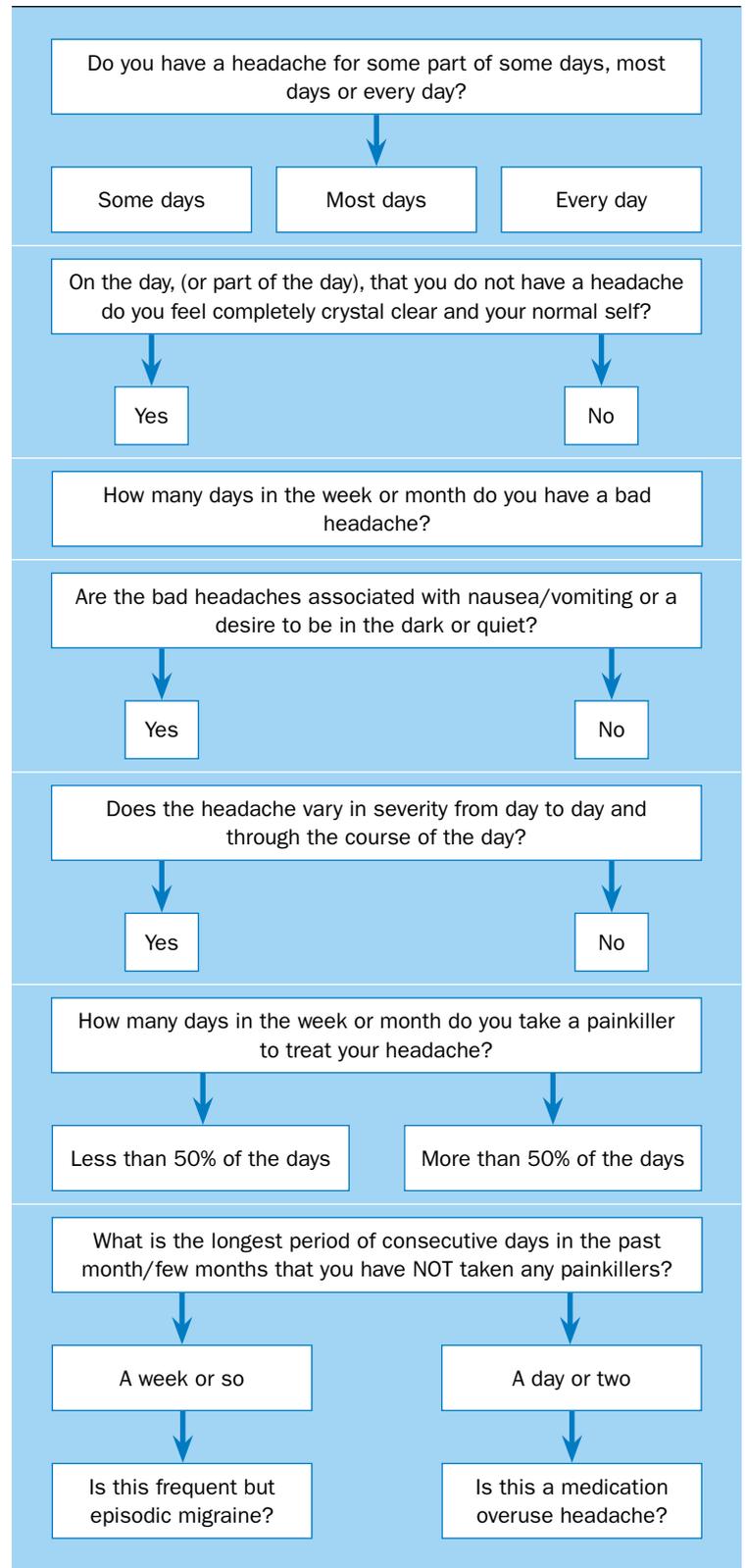


Figure 2. Questioning patients with daily headache

- Do you get travel sick?
 - Can you read in a car without feeling sick?
 - Sit in the back of a car without feeling sick?
 - Did you get travel sick as a child?
 - Is there a family history of travel sickness?
- Do you feel dizzy or sick when watching or observing a moving object?
- Do you find that you start to feel nauseous or are you unable to tolerate repeated head movements?
- Do you currently suffer from or have you suffered from migraine headaches?
- Do you experience migraine visual aura?
- Is there a family history of migraine?
- Do you experience other migrainous symptoms such as sensitivity to light, noise or smells?
- Do your symptoms of dizziness/vertigo get worse or vary with your period?
- Have you noticed a worsening of your dizziness/vertigo when the weather pressure drops?

Table 4. Questions to ask patients presenting with dizziness/vertigo (Adapted from: Fife TD.¹²)

A series of articles published in *Headache* (for the American Headache Society) reviews the published research evidence for the role of vagus nerve stimulation in a variety of conditions including cluster headache and migraine.^{14–16} They highlight the fact that vagus nerve stimulation modulates pain networks through a variety of pain-associated structures in the brain and spinal cord. As understanding of these complex networks evolves, devices are likely to become more effective and offer greater therapeutic benefit and a high safety profile.¹⁶

Nutraceuticals: what are they and do they work?

Patients are constantly seeking ways of managing their headache symptoms and often view ‘nutraceuticals’ or food supplements and herbs as a ‘safe’ and effective alternative. They may seek advice from their GP, who often may not have the knowledge or feel adequately skilled to offer support and guidance. The American Academy of Neurology (AAN), American Headache Society (AHS), Canadian Headache Society (CHS) and the European Federation of Neurological Societies (EFNS) have debated this repeatedly, and have not always agreed on the outcomes.

A review published in *Headache*¹⁷ has attempted to bring the clinical evidence together and offer practical options for the clinician to support their patients, in relation to the use of:

- riboflavin
- coenzyme Q10
- magnesium
- butterbur
- feverfew
- omega-3 polyunsaturated fatty acids

It should be noted that although butterbur has been used in the past, it is now not recommended due to liver safety concerns (see Table 5).¹⁹ It is important to enquire if the patient is using any complementary medication as there are potential risks of drug interactions causing harm.¹⁷ Access to these products vary, and

the quality can vary according to their source. Further challenges include the poor quality of the research evidence and patients’ perception that because they are ‘natural’ they are safe.

Conclusion

Patients with headache need careful and detailed assessment and examination, a clear diagnosis, involvement in decision making with regard to treatment, and regular support and review. Treatment response needs to be reviewed and modified according to patient need and expectation.

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Nutraceutical	CHS	AAN/AHS	EFNS
Riboflavin/ vitamin B2	Strong recommendation <ul style="list-style-type: none"> • low-quality evidence for benefit • minimal side-effects Dosage advice: 400mg daily	Level B recommendation <ul style="list-style-type: none"> • probably effective • should be considered for migraine prophylaxis 	Level C recommendation <ul style="list-style-type: none"> • possibly effective
Coenzyme Q10*	Strong recommendation <ul style="list-style-type: none"> • low-quality evidence for benefit Dosage advice: 100mg three times daily	Level C recommendation <ul style="list-style-type: none"> • possibly effective • may be considered 	Level C recommendation <ul style="list-style-type: none"> • possibly effective • may be considered
Magnesium citrate	Strong recommendation <ul style="list-style-type: none"> • low-quality evidence for benefit • minimal side-effects Dosage advice: magnesium citrate only, at 600mg daily	Level B recommendation <ul style="list-style-type: none"> • probably effective • should be considered for migraine prophylaxis 	Level C recommendation <ul style="list-style-type: none"> • possibly effective
Butterbur <i>Petasites hybridus</i> **	Although currently recommended by the CHS, there is much controversy because of hepatotoxicity. It is likely that this advice may change and in the interim, butterbur use is not recommended	Although currently recommended by the AAN/AHS, there is much controversy because of hepatotoxicity. It is likely that this advice may change and in the interim, butterbur use is not recommended	Although currently recommended by the EFNS, there is much controversy because of hepatotoxicity. It is likely that this advice may change and in the interim, butterbur use is not recommended
Feverfew <i>Tanacetum parthenium</i>	Strong recommendation <i>against</i> use	Level B recommendation <ul style="list-style-type: none"> • probably effective • should be considered for migraine prophylaxis The difference in advice (compared with CHS) was on the basis of how the studies were rated	Level C recommendation <ul style="list-style-type: none"> • possibly effective
Omega-3 polyunsaturated fatty acids	No recommendation	Level U <ul style="list-style-type: none"> • inadequate evidence to support or refute use 	Level U <ul style="list-style-type: none"> • inadequate evidence to support or refute use
*Coenzyme Q10 deficiency may be common in children and adolescents with migraine. If testing confirms deficiency, then doses of 1–3mg/kg daily may reduce headache frequency and disability ¹⁸ **Forty reported cases of hepatotoxicity with two requiring liver transplant reported. See MHRA advice ¹⁹			

Table 5. Nutraceuticals used in the treatment of headache: recommendations of the Canadian Headache Society (CHS), American Academy of Neurology/American Headache Society (AAN/AHS) and the European Federation of Neurological Societies (EFNS)

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Declaration of interests

Dr Fontebasso has facilitated educational sessions for GPs and other interested health professionals that have been funded by Allergan in the past 12 months. In the past, Dr Fontebasso

has attended advisory boards for Pfizer, MSD, AstraZeneca and GSK; she has also in the past received unrestricted educational grants from Allergan, Pfizer, MSD, AstraZeneca and GSK to attend international headache meetings.

Dr Fontebasso is a retired GP and worked as a GP with a special interest in headache at the Headache Clinic, York Hospital. She was an honorary senior clinical tutor at Hull York Medical School. She has retired from clinical practice but continues to be involved in headache education and facilitates educational meetings on this subject