Chapter 2
The Meaning of "Headache" in the Context of Society

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2.1 Introduction

Headache is common—one of the most frequently experienced symptoms of mankind [1]. Almost everybody has experience of it. It is also one of the most common medical complaints, which is not the same thing. To put some numbers to these statements, at least 40% of adults in all countries report headache as a recurring nuisance, 10–30% are at least sometimes disabled by it and 2–10% bear it, with varying levels of incapacity, on more days than not [2, 3].

This very attribute somehow, perversely, works against it. Headache is so common that people often regard it as "normal", a perception that fosters a marked societal ambivalence towards it: while it renders some people almost helpless, others look upon all manifestations of headache with scorn or derision. Headache is the most frequent cause of consultation in both primary care and neurological practice [3]. It prompts many visits to internists, ENT specialists (otorhinolaryngologists), ophthalmologists, dentists, orthopaedic surgeons, psychologists and the proponents of a wide variety of complementary and alternative medical practices [3]. Headache is far from unknown as a presenting symptom in emergency departments, although it rarely signals serious underlying illness.

Headache may be mostly benign, but it hurts, and with pain comes disability. When headache is recurrent, repeated episodes of disability diminish quality of life, while impaired productivity leads to financial loss—each a personal burden. The public-health and *societal* importance of headache lies in these causal associations expressed in large numbers of people.

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2.2 Headache Disorders

Headache itself is a feature, often characteristic, of a very large number of disorders. The International Classification of Headache Disorders (ICHD) describes more than 200 headache types, subtypes or subforms [1]. As Table 2.1 shows, ICHD distinguishes between *primary headaches*, which have no other underlying causative disorder, and *secondary headaches*, attributed to some other disorder. The third section of ICHD covers painful cranial neuropathies and other facial pain [1].

Tables 2.2, 2.3 and 2.4 briefly describe the relatively few of these disorders that are common or, for other reasons, important. These are the headaches of which all healthcare providers, including and especially those in primary care, should have knowledge and some understanding in order to meet the very substantial need they generate for professional care. The secondary headaches in Table 2.3 must never be missed. As for the primary headaches (Table 2.2), effective management of these is often achievable without recourse to professional care, by lifestyle adaptation and appropriate use of over-the-counter (OTC) medications. But equally often this is not the case, and the need for professional care arising from these disorders places a substantial demand on health services. Recognition of where this demand comes from, and an understanding based on empirical evidence of the people and the disorders that most contribute to it, are key to the design and implementation of headache services, and to the delivery, within these, of effective, efficient and equitable headache care.

Table 2.1 International classification of headache disorders, 3rd edition (ICHD-3) [1]

Chapter	Part One: The Primary Headaches
1	Migraine
2	Tension-type headache
3	Trigeminal autonomic cephalalgias
4	Other primary headache disorders
	Part Two: The Secondary Headaches
5	Headache attributed to trauma or injury to the head and/or neck
6	Headache attributed to cranial and/or cervical vascular disorder
7	Headache attributed to non-vascular intracranial disorder
8	Headache attributed to a substance or its withdrawal
9	Headache attributed to infection
10	Headache attributed to disorder of homoeostasis
11	Headache or facial pain attributed to disorder of the cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cervical structure
12	Headache attributed to psychiatric disorder
	Part Three: Painful Cranial Neuropathies, Other Facial Pain and Other Headaches
13	Painful lesions of the cranial nerves and other facial pain
14	Other headache disorders

Table 2.2 Important primary headaches in ICHD-3 [1]

1. Migraine
1.1 ***Migraine without aura***
Recurrent headache attacks lasting 4–72 h. Typically, the headache is unilateral, pulsating, moderate or severe, aggravated by routine physical activity and associated with nausea and/or photophobia and phonophobia.
1.2 ***Migraine with aura***
Recurrent attacks, lasting minutes, of unilateral fully reversible visual, sensory or other central nervous system symptoms that usually develop gradually and are usually followed by headache and associated migraine symptoms.
1.3 ***Chronic migraine***
Headache occurring on ≥15 days/month for >3 months, which, on ≥8 days/month, has the features of migraine headache.
2. Tension-type headache (TTH)
2.2 ***Frequent episodic tension-type headache***
Frequent episodes of headache lasting minutes to days. Typically, it is bilateral, pressing or tightening and mild or moderate. It lacks the specific characteristics of migraine: neither aggravated by routine physical activity nor associated with nausea (either photophobia or phonophobia may be present).
2.3 ***Chronic tension-type headache***
A disorder evolving from frequent episodic TTH, with daily or very frequent headache lasting hours to days, or unremitting, typically bilateral, pressing or tightening and mild or moderate. The pain does not worsen with routine physical activity, but may be associated with mild nausea, photophobia or phonophobia.
3. Trigeminal autonomic cephalalgias
This group of uncommon disorders shares the clinical features of short-duration headache and prominent cranial parasympathetic autonomic features.
3.1 ***Cluster headache***
Attacks of severe, strictly unilateral, orbital, supraorbital and/or temporal pain lasting 15–180 min and occurring from once every other day to eight times a day. The pain is associated with ipsilateral conjunctival injection, lacrimation, nasal congestion, rhinorrhoea, forehead and facial sweating, miosis, ptosis and/or eyelid oedema, and/or with restlessness or agitation.
3.1.1 ***Episodic cluster headache***
Cluster headache attacks occurring in periods lasting from 7 days to 1 year, separated by pain-free periods lasting at least 3 months.
3.1.2 ***Chronic cluster headache***
Cluster headache attacks occurring for 1 year or longer without remission, or with remission periods lasting <3 months.

Two primary headache disorders—migraine and tension-type headache (TTH)—are widespread, prevalent and often lifelong conditions. These are subjects of this monograph; secondary headache disorders, with the single exception of medication-overuse headache (MOH), are not—even those listed in Table 2.3. Collectively, migraine, TTH and MOH affect at least 40% of most populations [4] and are the cause of much disability throughout the world [4, 5]. Other headache disorders, such as cluster headache, may be highly disabling at individual level, but they are too uncommon to signify at societal level.[1]

[1] The meaning here is that they add insignificantly to societal burden, not that no provision should be made for healthcare for such disorders. Headache services set up adequately to manage headache disorders (see Chap. 15) would take these and rarer disorders into account.

Table 2.3 Important secondary headaches in ICHD-3 [1]

5. Headache attributed to trauma or injury to the head and/or neck

5.2 ***Persistent headache attributed to traumatic injury to the head***

Headache of >3 months' duration caused by traumatic injury to the head. It is often part of the post-traumatic syndrome, which includes symptoms such as equilibrium disturbance, poor concentration, decreased work ability, irritability, depressive mood and sleep disturbances.

6. Headache attributed to cranial and/or cervical vascular disorder

6.2.2 ***Acute headache attributed to non-traumatic subarachnoid haemorrhage (SAH)***

Headache caused by non-traumatic SAH, typically severe and sudden in onset, peaking in seconds (thunderclap headache) or minutes. Non-traumatic SAH is one of the most common causes of thunderclap headache. It is serious: delayed diagnosis often has a catastrophic outcome.

6.4.1 ***Headache attributed to giant cell arteritis (GCA)***

Headache, with variable features, caused by and symptomatic of GCA. Conspicuously associated with headache, GCA must be recognised: any persisting headache with recent onset in a patient >60 years of age should suggest it. Blindness is a major risk, preventable by immediate steroid treatment.

7. Headache attributed to non-vascular intracranial disorder

7.2 ***Headache attributed to low cerebrospinal fluid (CSF) pressure***

Headache caused by low CSF pressure, usually orthostatic and accompanied by neck pain, tinnitus, changes in hearing, photophobia and/or nausea. It remits after normalization of CSF pressure. Three subtypes are distinguished by aetiology: following recent dural puncture, attributed to persistent CSF leakage (CSF fistula) or spontaneous.

7.4.1 ***Headache attributed to intracranial neoplasm***

Headache caused by one or more space-occupying intracranial tumours. Headache is a common symptom of intracranial tumours, more so in young patients (including children), but it rarely remains the only symptom: neurological deficits and seizures are common.

8. Headache attributed to a substance or its withdrawal

8.1.3 ***Carbon monoxide (CO)-induced headache***

Headache caused by exposure to CO, resolving within 72 h after its elimination. Dependent on carboxyhaemoglobin level, headache ranges from mild without other symptoms to severe with nausea, vomiting, blurred vision and, ultimately, impaired consciousness.

8.2 ***Medication-overuse headache (MOH)***

Headache on ≥15 days/month in a patient with a pre-existing primary headache (usually migraine or TTH), developing as a consequence of regular overuse for >3 months of acute or symptomatic medication for headache. Usually, it resolves after the overuse is stopped. Correct diagnosis of MOH is important because patients will not improve without withdrawal of the offending medication.

9. Headache attributed to infection

9.1.1 ***Headache attributed to bacterial meningitis or meningoencephalitis***

Headache of variable duration caused by bacterial meningitis or meningoencephalitis. It may develop with mild flu-like symptoms and is typically acute and associated with neck stiffness, nausea, fever and changes in mental state and/or other neurological symptoms and/or signs. In most cases, headache resolves with resolution of the infection.

11. Headache or facial pain attributed to disorder of the cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cervical structure

11.3.1 ***Headache attributed to acute angle-closure glaucoma***

Headache, usually unilateral, caused by acute angle-closure glaucoma and associated with other symptoms and clinical signs of this disorder (eye and/or periorbital pain, visual acuity loss (blurring), conjunctival injection and oedema, nausea and vomiting). Early diagnosis is essential: as intraocular pressure rises, so does the risk of permanent visual loss.

Table 2.4 Important painful cranial neuropathies and other facial pain in ICHD-3 [1]

13. Painful lesions of the cranial nerves and other facial pain
13.1.1 ***Trigeminal neuralgia (TN)***
A disorder characterized by recurrent unilateral brief electric shock-like pains, abrupt in onset and termination, limited to the distribution(s) of one or more divisions of the trigeminal nerve and triggered by innocuous stimuli. Additionally, there may be concomitant continuous pain of moderate intensity within the same nerve distribution(s). TN may develop without apparent cause or be a result of another disorder.
13.12 ***Persistent idiopathic facial pain (PIFP)***
Persistent facial and/or oral pain, with varying presentations but recurring daily for >2 h/day over >3 months, in the absence of clinical neurological deficit. PIFP presents with high levels of psychiatric comorbidity and psychosocial disability and may be comorbid with other pain conditions such as chronic widespread pain and irritable bowel syndrome.

2.2.1 Migraine

At the societal level, migraine far outweighs all other headache disorders in its deleterious effect on health. It is second only to low back pain among all causes of disability [4, 5], responsible for almost half the financial cost of headache [6], and the principal progenitor of MOH, which is responsible for another third [6].

Migraine is the most recognized and best studied of the headache disorders [1]. It is a familial disorder, with a genetic component not yet fully understood. Its prevalence among adults varies worldwide, from 9.3% in China [7] to over 30% in Nepal [8] according to studies conducted with similar methods, and therefore comparable [9, 10]. The global mean is almost certainly higher than the current estimate of about 15% [5, 6]. The Global Burden of Disease study 2010 (GBD2010) ranked migraine as the third most prevalent disorder in the world [11]. Women are 1.5–3 times more likely to be affected than men [2] because of hormonal influences [1].

Migraine is an unpleasant illness. In the great majority of cases, it is a recurrent episodic disorder starting in childhood or adolescence (in girls, in particular, it may start at puberty) and in many cases lasting throughout life. Attack frequency is subject to lifestyle and environmental factors and varies widely between and within individuals, averaging once or twice a month. Headache and nausea (with or without vomiting) are the most characteristic attack features; photophobia and phonophobia are common and relatively specific symptoms [1]. The headache, lasting for hours to 2–3 days, is typically moderate or severe and likely to be unilateral, pulsating and aggravated by routine physical activity [1].

Migraine has two major types. *Migraine without aura* is a clinical syndrome characterized by these features, most of which are captured in the diagnostic criteria of ICHD [1] (Table 2.5). About 10% of migraine attacks overall are *migraine with aura*, experienced only by a third of people with migraine and distinguished by the transient focal neurological symptoms that usually precede but sometimes accompany the headache [1] (Table 2.5). Some people, with either type of migraine, also experience a prodromal phase, occurring hours or days before the headache, and/or

Table 2.5 ICHD-3 diagnostic criteria for migraine with and without aura [1]

1.1 ***Migraine without aura***	**1.2** ***Migraine with aura***
A. At least five attacks fulfilling criteria B–D B. Headache attacks lasting 4–72 h (when untreated)[1] C. Headache has at least two of the following four characteristics: 1. Unilateral location 2. Pulsating quality 3. Moderate or severe pain intensity 4. Aggravation by or causing avoidance of routine physical activity (e.g., walking or climbing stairs) D. During headache at least one of the following: 1. Nausea and/or vomiting 2. Photophobia and phonophobia E. Not better accounted for by another ICHD-3 diagnosis. *Note:* 1. In children and adolescents (aged under 18 years), attacks may last 2–72 h.	A. At least two attacks fulfilling criteria B and C B. One or more of the following fully reversible aura symptoms: 1. Visual 2. Sensory 3. Speech and/or language 4. Motor, brainstem and/or retinal[1] C. At least three of the following six characteristics: 1. At least one aura symptom spreads gradually over ≥5 min 2. Two or more aura symptoms occur in succession 3. Each individual aura symptom lasts 5–60 min 4. At least one aura symptom is unilateral[2] 5. At least one aura symptom is positive[3] 6. The aura is accompanied, or followed within 60 min, by headache[4] D. Not better accounted for by another ICHD-3 diagnosis. *Notes:* 1. Motor, brainstem and retinal symptoms are atypical, occurring in specific subtypes of migraine with aura, and should lead to referral. 2. Aphasia is regarded as a unilateral symptom. 3. Scintillations and pins and needles are positive symptoms of aura. 4. *Typical aura without headache* is a recognised subtype.

a postdromal phase following headache resolution. Common prodromal symptoms include fatigue, elated or depressed mood, unusual hunger and cravings for certain foods; postdromal symptoms include fatigue, elated or depressed mood and cognitive difficulties. Together, this array of symptoms, not surprisingly, are disabling: GBD2016 [4] and GBD2017 [5] ranked migraine as the second-highest cause of disability worldwide.

Between attacks, most people with either of these migraine types are completely well. However, for many, attacks tend to be unpredictable: they can start at any time, and some people are more prone to attacks than are others. So-called trigger factors play a part in this. While this calls for their avoidance as a sensible management tactic, avoidance itself, involving lifestyle compromise, can be a factor relevant to burden (Chap. 4).

A third type, *chronic migraine*, is specifically characterized by very frequent attacks and/or loss of episodicity. Headache occurs on 15 or more days per month, but not always with the features of migraine headache (for the diagnosis, these are required only on 8 or more days per month [1]). Chronic migraine is very highly disabling, but it still lacks a universally accepted definition. The criteria of ICHD-3

Table 2.6 ICHD-3 diagnostic criteria for chronic migraine [1]

1.3 ***Chronic migraine***
A. Headache (migraine-like or tension-type-like[1]) on ≥15 days/month for >3 months, and fulfilling criteria B and C
B. Occurring in a patient who has had at least five attacks fulfilling criteria B–D for 1.1 *Migraine without aura* and/or criteria B and C for 1.2 *Migraine with aura*
C. On ≥8 days/month for >3 months, fulfilling any of the following: 1. Criteria C and D for 1.1 *Migraine without aura* 2. Criteria B and C for 1.2 *Migraine with aura* 3. Believed by the patient to be migraine at onset and relieved by a triptan or ergot derivative
D. Not better accounted for by another ICHD-3 diagnosis[2].
Notes:
1. Because it is impossible to distinguish the individual episodes of headache in patients with such frequent or continuous headaches, attacks with and those without aura are both counted in diagnosing 1.3 *Chronic migraine*, as are both migraine-like and tension-type-like headaches.
2. The most common cause of symptoms suggestive of chronic migraine is medication overuse. Around 50% of patients apparently with chronic migraine revert to an episodic migraine type after drug withdrawal.

[1] (Table 2.6) may appear to be authoritative but are regularly modified by researchers and authors, so that the disorder is confusingly conflated with MOH (e.g., [12, 13]). Therefore, the prevalence of chronic migraine has not been reliably established. By the best working definition, it is rare [14], and, like cluster headache, not itself of great public-health importance.[2]

2.2.2 Tension-Type Headache (TTH)

TTH is the most prevalent of all the headache disorders, but highly variable in its expression and uncommonly a cause of serious disability. It has some societal importance, but much less than that of migraine.

TTH is the common sort of headache that nearly everyone has occasionally, so that many people refer to it as "normal" or "ordinary" headache, terms that deny its status as a headache disorder. While GBD2010 ranked it as the second most prevalent disorder in the world (behind dental caries) [10], its reported prevalence is nonetheless hugely variable [2]. This, probably, is due in most part to under-reporting of mild cases. The true prevalence probably exceeds 50% [2], but only when infrequent episodic TTH is included (less than 1 episode per month), which may indeed fall outside the definition of headache disorder [1]. In most but not all populations, TTH affects rather more women than men; children report it also, but to a lesser extent.

[2] As before, this means it does not add significantly to societal burden, not that no healthcare provision should be made for it. Headache services set up adequately to manage headache disorders (see Chap. 15) would take adequate account of it.

Table 2.7 ICHD-3 diagnostic criteria for the important types of tension-type headache [1]

2.2 ***Frequent episodic tension-type headache***	**2.3** ***Chronic tension-type headache***
A. At least 10 episodes of headache occurring on 1–14 days/month on average for >3 months and fulfilling criteria B–D B. Lasting from 30 min to 7 days C. At least two of the following four characteristics: 1. Bilateral location 2. Pressing or tightening (non-pulsating) quality 3. Mild or moderate intensity 4. Not aggravated by routine physical activity such as walking or climbing stairs D. Both of the following: 1. No nausea or vomiting 2. No more than one of photophobia or phonophobia E. Not better accounted for by another ICHD-3 diagnosis.	A. Headache on ≥15 days/month on average for >3 months, fulfilling criteria B–D B. Lasting hours to days, or unremitting C. At least two of the following four characteristics: 1. Bilateral location 2. Pressing or tightening (non-pulsating) quality 3. Mild or moderate intensity 4. Not aggravated by routine physical activity such as walking or climbing stairs D. Both of the following: 1. No more than one of photophobia, phonophobia or mild nausea 2. Neither moderate or severe nausea nor vomiting E. Not better accounted for by another ICHD-3 diagnosis[1,2]. *Notes:* 1. Both 2.3 *Chronic TTH* and 1.3 *Chronic migraine* require headache on ≥15 days/month. For 2.3 *Chronic TTH*, headache must on ≥15 days meet criteria B–D above; for 1.3 *Chronic migraine*, headache must on ≥8 days meet criteria B–D for 1.1 *Migraine without aura*. A patient can fulfil criteria for both, for example, with headache on 25 days/month meeting migraine criteria on 8 days and TTH criteria on 17. Only 1.3 *Chronic migraine* is then diagnosed. 2. In many uncertain cases, there is overuse of medication. After withdrawal, there may be reversion to episodic TTH.

TTH episodes vary greatly in duration, from minutes to several days, but usually last a few hours. Their frequency also varies widely, both between people and in individual people over time. The pain of TTH lacks the specific characteristics of migraine, as is reflected in the diagnostic criteria of ICHD [1] (Table 2.7): it neither worsens with routine physical activity nor is associated with nausea (although either photophobia or phonophobia may be present). Further, it is usually bilateral or generalized; people describe it as a squeezing or pressure, like a tight band around the head—the opposites of descriptions of migraine headache. TTH often spreads down to or up from the neck. Although mostly moderate or mild, this headache can be bad enough to make it difficult to carry on entirely as normal [15].

TTH pursues a highly variable course, commonly beginning in the teenage years and reaching peak levels in the 30s. Although never serious, in a few people TTH becomes bothersome enough to need medical attention, usually because it has become frequent. There are distinct types although, in any individual, one may give way to another. Two are important (Table 2.7). Frequent episodic TTH occurs, like

migraine, in attack-like episodes. Chronic TTH, which has a prevalence of up to 3% in adults [2], is a disorder evolving from frequent episodic TTH, with daily or very frequent episodes of similarly described headache, lasting hours to days and sometimes unremitting over long periods. This headache may be associated with mild nausea [1]. It can be quite disabling and distressing.

2.2.3 Medication-Overuse Headache (MOH)

MOH may top the list in terms of societal importance, not because it is the most prevalent headache disorder but for two other reasons: at individual level it is the most disabling and by far the most costly of the common headaches [6], and, unlike migraine and TTH, it is wholly avoidable.

ICHD defines MOH as a secondary headache [1], but it occurs only in patients with a prior headache disorder. The cause is chronic excessive use of medication(s) taken to treat that headache. MOH is therefore better considered as a *sequela* of a primary headache disorder, more usually migraine than TTH. This was recognized in GBD2016 [4], and again in GBD2017 [5], which, instead of reporting MOH separately, attributed its disability burden proportionately to these primary headaches (see Chap. 9).

All medications used to treat acute headache are associated with this problem, although the mechanism through which MOH develops undoubtedly varies between different drug classes. Wherever they are available, opioids such as codeine tend especially to be implicated, but this probably is a consequence of selection by patients who erroneously believe the solution lies in "stronger" medications, coupled with the exhortative messages by which codeine-containing medications are generally promoted to the public (Fig. 2.1). The risk of MOH escalates with medication frequency regardless of the drug, and is high whenever these treatments are taken regularly on more than 2–3 days a week. In individual patients, an evolutionary course can often be retrospectively charted: the usual start is that occasional headache attacks increase in frequency, through natural variation or because an additional headache has developed. Medication use follows, also becoming more frequent, and this is encouraged initially by its apparent efficacy. Over time, weeks or sometimes very much longer, as headache episodes and medication intake become ever more frequent, efficacy wanes. Natural responses then are to switch to medications perceived to be stronger, and to increase doses. While these behaviours lead inexorably to worsening in the long term, attempts at withdrawal induce

Fig. 2.1 Promotional message, aimed at the public and typical of many, for a branded over-the-counter codeine-containing acute migraine therapy

Table 2.8 ICHD-3 diagnostic criteria for medication-overuse headache [1]

8.2 ***Medication-overuse headache***
A. Headache occurring on ≥15 days/month in a patient with a pre-existing headache disorder
B. Regular overuse for >3 months of one or more drugs that can be taken for acute and/or symptomatic treatment of headache[1,2]
C. Not better accounted for by another ICHD-3 diagnosis.
Notes:
1. Drugs may be ergotamine, one or more triptans, non-opioid analgesics including paracetamol (acetaminophen), acetyl salicylic acid and other non-steroidal anti-inflammatory drugs (NSAIDs), opioids, combination analgesics (typically containing simple analgesics plus opioids, butalbital and/or caffeine) or any combination of these.
2. Overuse is defined as intake on ≥15 days/month for non-opioid analgesics alone and in all other cases as intake on ≥10 days/month.

immediate—and highly discouraging—aggravation of symptoms. In the end-stage, if this process is not interrupted, MOH is unremitting, only fluctuating with medication use repeated every few hours.

Correct diagnosis is important for these reasons, and more so because patients will not improve without withdrawal of the offending medication(s), which are often multiple. On the other hand, most patients with MOH improve within 2 months after withdrawal, as does their responsiveness to preventative treatment.

The ICHD diagnostic criteria [1] for MOH are in Table 2.8. It is an oppressive headache, obviously persistent, and highly disabling.

MOH has a highly variable prevalence worldwide, and estimates are uncertain [16]; while the average is 1.5–2% in adults [17], some national estimates exceed 7% with reasonable certainty [18, 19]. Factors contributing are high prevalences of the progenitor headaches (putting more people at risk) and, probably, easy access to OTC medications coupled with poor access to healthcare and lack of public health-education [18, 19].

2.3 Concluding Remarks

Although more than 200 headache disorders are clearly defined by their distinct characteristics and clinical features [1], and several of these disorders are described here, just three contribute significantly to the societal impact of headache. Migraine, TTH and MOH overwhelm all others in their shares of the total population ill health that is attributable to headache. Furthermore, MOH may properly be regarded as a *sequela* of migraine and TTH; its burdens in reality belong to these two primary headache disorders [4, 5].

It is essentially for these few conditions that society must make provision, if it wishes to lessen the impact. This fact makes the task (described in Chap. 15) a great deal easier.

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