



Chronic migraine and other types of chronic daily headache

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Key points

- Chronic daily headache is a common condition.
- Establishing the presence of chronic daily headache requires documentation of more than 15 days per month of prolonged headache (lasting more than four hours).
- Most cases of chronic daily headache are due to primary headache, but other causes such as structural lesions must be considered; most cases of primary headache that are troublesome are due to chronic migraine.
- Treatments for patients with chronic migraine are now available.
- Medication overuse is a common complication of headache treatment and makes successful treatment more difficult.

Chronic daily headache is a common and disabling condition. It is usually due to primary headache, most often migraine, but other causes must be kept in mind. A simple approach to diagnosis is required.

The disabling nature of chronic daily headache has led to increasing interest in its causes and treatment over the past 20 years. Chronic daily headache is defined as headache occurring on more than 15 days per month. Some syndromes of head pain involve recurrent pain of short duration, but the most common pattern is pain lasting four or more hours and most current definitions of chronic daily headache exclude shorter durations of pain. The various types of short-duration frequent headache will be reviewed in a future issue of *Medicine Today*.

Chronic daily headache is common. Epidemiological studies suggest a worldwide prevalence of about 4%.¹ Several distinct syndromes have been identified, and it is clear that most people with severe and disabling chronic daily headache have chronic migraine.

There are a number of controversial issues in the classification of these disorders, but probably the most crucial is the matter of medication overuse. The current official

guidelines, the *International Classification of Headache Disorders*, 2nd edition (ICHD-2)², indicate that medication-overuse headache is a disorder in its own right and that other diagnoses should be considered only when medication overuse has been ruled out. However, in most cases medication overuse develops as a consequence of increasingly frequent headache (usually migraine). Therefore, there is a strong argument that medication-overuse headache should usually be regarded as a complication and aggravating factor of the primary disorder (e.g. chronic migraine). This is not intended to downplay the importance of medication overuse: in some patients it undoubtedly contributes to the conversion of episodic migraine to chronic migraine and to perpetuation of the chronic migraine state.

The diagnostic approach to chronic daily headache is simple and mechanical. First, establish the presence of chronic daily headache by confirming the frequency and duration of headache episodes and excluding

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DIAGNOSTIC CRITERIA OF HEMICRANIA CONTINUA²**Description**

Persistent strictly unilateral headache responsive to indomethacin.

Diagnostic criteria

A. Headache for more than three months fulfilling criteria B to D below

B. Presence of all of the following characteristics:

- unilateral pain without side shift
- daily and continuous, without pain-free periods
- moderate intensity, but with exacerbations of severe pain

C. Presence of at least one of the following autonomic features during exacerbations, ipsilateral to the side of pain:

- conjunctival injection and/or lacrimation
- nasal congestion and/or rhinorrhoea
- ptosis and/or miosis

D. Complete response to therapeutic doses of indomethacin

E. Not attributed to another disorder

secondary causes. Next, consider in turn the typical features of hemicrania continua, new daily persistent headache, chronic migraine and tension-type headache (see the flowchart on page 31).³⁻⁵

HEMICRANIA CONTINUA

Hemicrania continua is an uncommon disorder but is very characteristic in its classic form (see the box on this page). The headache is strictly unilateral in location and present daily and continuously, without pain-free periods. The pain is usually of moderate intensity, but with exacerbations of severe pain. It responds dramatically to treatment with indomethacin, but not other NSAIDs. Autonomic symptoms such as conjunctival injection or lacrimation, nasal congestion and ptosis or miosis are common when the

pain is more severe, and intermittent jabs or jolts of pain may be superimposed over the persistent headache. It can occur at any age and is more common in women (in one study there were 24 women and 10 men affected, with ages of onset from 5 to 67 years and a mean age of onset of 28 years).⁶ In most patients the condition is unremitting.

Treatment of patients with hemicrania continua is with indomethacin, but the doses required are often high (150 mg/day; sometimes 225 mg/day). This means that gastric, renal and other side effects may limit its use.

NEW DAILY PERSISTENT HEADACHE

New daily persistent headache is not rare but is often not diagnosed (see the box on this page). Correct diagnosis has both therapeutic and prognostic implications because patients with this condition are notoriously difficult to manage. The major diagnostic pointer is that the patient can give the date of onset of the headache with considerable precision. Current ICHD diagnostic criteria exclude patients with migrainous features, but many authorities believe that the behaviour and response to treatment of such patients (whose daily headaches, with migrainous features, arise suddenly over one to three days) more closely resemble those of patients with new daily persistent headache than those with chronic migraine.⁷

Sometimes the headache follows a respiratory or other infection, but in most cases no trigger is obvious.

Treatment of patients with new daily persistent headache usually involves trials of various migraine prophylactic agents with a frustrating lack of success. There is no recognised or reliably effective treatment and the condition simply runs its course.

CHRONIC MIGRAINE

Chronic migraine is the most important form of chronic daily headache. It accounts for about half of the cases of

DIAGNOSTIC CRITERIA OF NEW DAILY PERSISTENT HEADACHE²**Description**

Headache that is daily and unremitting from very soon after onset (within three days at most). The pain is typically bilateral, pressing or tightening in quality and of mild to moderate intensity. There may be photophobia, phonophobia or mild nausea.

Diagnostic criteria

A. Headache for more than three months fulfilling criteria B to D below

B. Headache is daily and unremitting from onset or from less than three days from onset

C. Presence of at least two of the following pain characteristics:

- bilateral location
- pressing/tightening (nonpulsating) quality
- mild or moderate intensity
- not aggravated by routine physical activity such as walking or climbing stairs

D. Presence of both of the following:

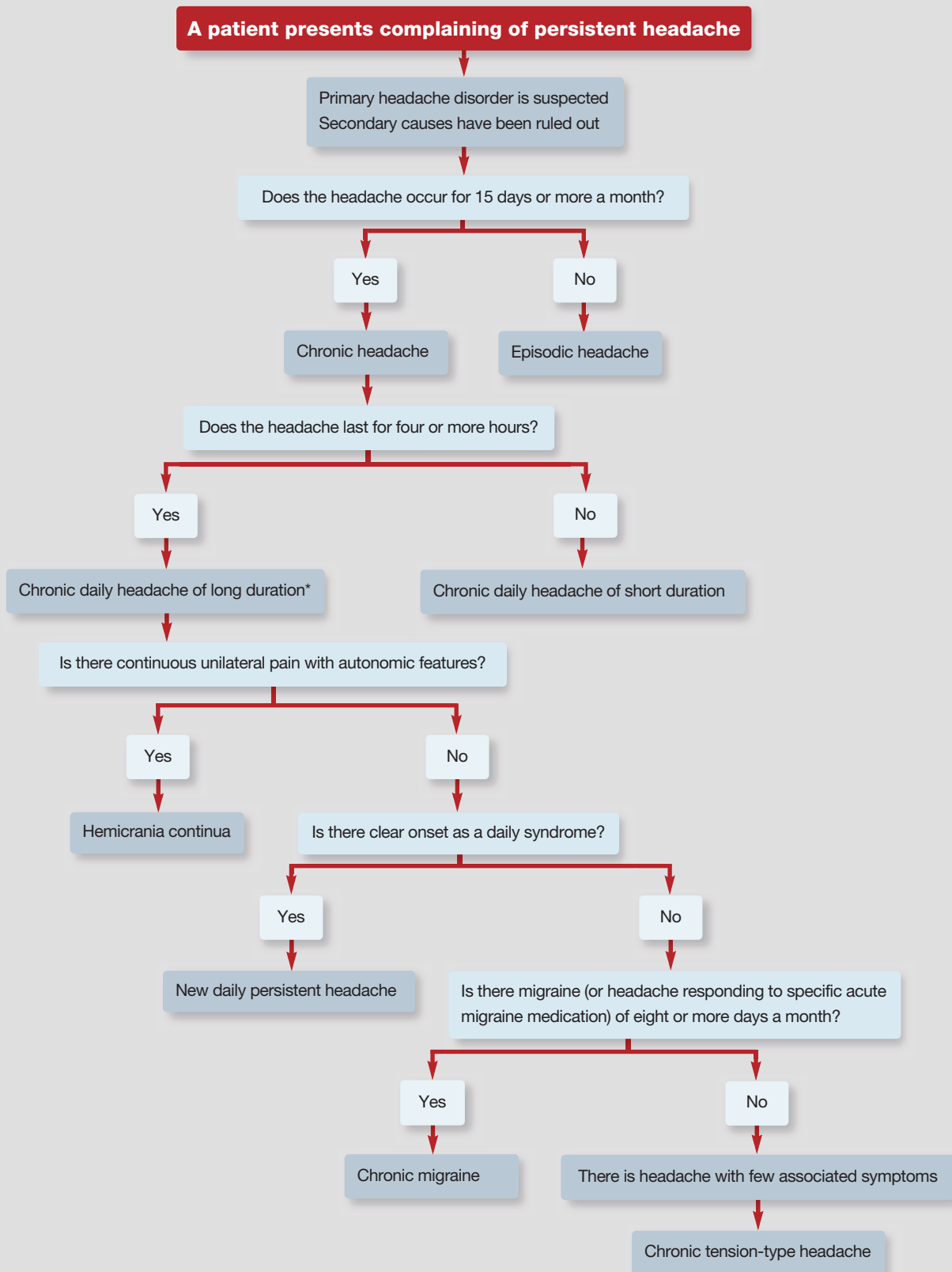
- no more than one of photophobia, phonophobia or mild nausea
- neither moderate or severe nausea nor vomiting

E. Not attributed to another disorder

chronic daily headache in community surveys, but most cases are severe enough to be seen by headache specialists. The worldwide prevalence of chronic migraine is about 2%.⁸

The definition of chronic migraine has evolved amid controversy. The problem is that as migraine becomes more frequent, the characteristic features (i.e. nausea, vomiting, light and sound sensitivity and throbbing) may become less prominent. The definitions of chronic migraine do not require that all headache episodes be migrainous, but various attempts have

DIAGNOSING THE PATIENT WITH PERSISTENT HEADACHE³⁻⁵



* Daily or near daily headache lasting for four or more hours. Can be with or without medication overuse.

DIAGNOSTIC CRITERIA OF CHRONIC MIGRAINE⁹

- A. Headache (tension-type and/or migraine) on 15 days or more per month for three or more months
- B. Occurring in a patient who has had at least five attacks fulfilling criteria for migraine without aura
- C. On eight or more days per month for three or more months headache has fulfilled criteria C1 or C2 below (that is, has fulfilled criteria for pain and associated symptoms of migraine without aura):
1. Presence of at least two of a to d below:
 - a. unilateral location
 - b. pulsating quality
 - c. moderate or severe pain intensity
 - d. aggravation by or causing avoidance of routine physical activity (for example, walking or climbing stairs) and at least one of i or ii below:
 - i. nausea and/or vomiting
 - ii. photophobia and phonophobia
 2. Treated and relieved by triptan(s) or ergotamine before the expected development of C1 above
- D. No medication overuse and not attributed to another causative disorder

been made to set out the minimum requirement. The most widely accepted definition currently is that given by the *ICHD-2* (revised) (see the box on this page).⁹ Although their headaches are not always 'migrainous', patients with chronic migraine are much more disabled than those with episodic migraine. The inability to commit reliably to routine work or domestic and social activities because of headache present most days is often the most disturbing issue for patients. Attempts to continue to function by taking escalating doses of acute medication may help in the short term but tend to

produce intractable chronic migraine complicated by medication overuse.

The biology of chronic migraine is still under investigation, but many features point to central sensitisation of pain pathways as a major factor, showing similarities to other chronic pain syndromes. It is not surprising that there are differences in the way patients with chronic migraine respond to various treatments compared with patients with episodic migraine.

Most cases of chronic migraine evolve from a pattern of episodic migraine. It is therefore sensible to look at the risk factors that contribute to this conversion (see the box on this page).

The single most important issue when presented with a patient with increasing frequency of migraine (especially if they are approaching the chronic migraine range with a frequency of almost 15 days per month) is to avoid treating them for acute headache with drugs that are known to be likely to produce medication-overuse headache. The safest treatment option in this regard seems to be NSAIDs (especially naproxen at a dose of up to 500 mg three times a day). In Australia, the drugs most likely to cause problems are those containing codeine: unfortunately, combined preparations with up to 15 mg codeine per tablet are available over the counter, and higher doses are prescribed regrettably often. Other opioids are, of course, just as problematic. There is a strong argument that all opioids should be avoided in patients with frequent headache. Triptans and ergotamine can also contribute to medication overuse and their use should be limited to no more than eight to 10 days per month.

The treatment of patients with chronic migraine is challenging. First, it should be determined whether the headache is due to medication overuse. If so, most authorities recommend dealing with the medication overuse initially.¹⁰ Standard migraine prophylactics are often relatively

RISK FACTORS FOR MIGRAINE PROGRESSION FROM EPISODIC TO CHRONIC MIGRAINE**Not modifiable by health interventions**

- Female sex
- Low socioeconomic status
- Head trauma

Modifiable by health interventions

- Obesity
- Medication overuse
- Caffeine overuse
- Stressful life events
- Snoring

ineffective when medication overuse is present, but become effective when the medication overuse is under control. There is little published evidence for the effectiveness or otherwise of most migraine preventives in patients with chronic migraine, but we now have good evidence that both topiramate and botulinum toxin are effective (even sometimes in patients still overusing acute medications).^{11,12} The benefit of botulinum toxin (which seems to be effective in patients with chronic migraine but not those with episodic migraine) is thought to relate to alterations in the release of neuromodulators from sensory nerves, perhaps therefore counteracting the upregulation of central pain pathways.

Concomitant medical and psychiatric disorders, including depression, sleep disorders and obesity, should be managed at the same time as the chronic migraine. Patients with a susceptibility to migraine may have migrainous headaches triggered by other painful conditions around the head and neck and, if present, these should also be treated; however, some patients invest substantial effort in pursuing unrewarding treatments of the neck, temporomandibular joint, sinuses and so forth.

Although challenging, the treatment of patients with chronic migraine can be enormously rewarding. Patients who can once more engage reliably in work and family and social activities are among the most grateful patients seen in neurological practice.

CHRONIC TENSION-TYPE HEADACHE

Chronic tension-type headache is defined as chronic daily headache that fails to meet the criteria for the other three disorders discussed, namely hemicrania continua, new daily persistent headache and chronic migraine. It is somewhat controversial as an entity as many US headache specialists believe that it is overdiagnosed and is in fact rare: they point to the fact that when diary data are collected, many diagnoses of tension-type headache should in fact be migraine.¹³ In Europe, there is a different view, and tension-type headache is considered common. It does seem clear, however, that chronic tension-type headache is much less disabling than chronic migraine.

Despite its apparent frequency (up to 2% of the population in many surveys¹), the treatment of patients with chronic tension-type headache is not well defined. There have been few trials addressing this topic (and indeed very few addressing episodic tension-type headache). There is some evidence to support the use of amitriptyline in doses of 10 to 75 mg/day (off-label use).¹⁴

Curiously, botulinum toxin seems to be ineffective in patients with chronic tension-type headache, which seems to argue against muscle tightness being a significant factor in the pain of chronic tension-type headache.

MEDICATION-OVERUSE HEADACHE

It is debatable whether medication-overuse headache should be a 'stand-alone' diagnosis, as currently suggested by the *ICHD-2*, or considered as a complication of an underlying disorder (usually chronic migraine). Either way, it

is a major practical problem. The mechanism seems to be that regular use of the offending agent results in a degree of physiological habituation. Absence of the agent causes a withdrawal effect, the most prominent feature of which (in a headache-prone individual) is recurrent headache. This is sometimes described as 'rebound headache' and some patients find this term helpful in understanding the condition. Of course, the best way to treat such a headache in the short term is to take more of the offending drug, but this simply perpetuates the cycle in the longer term.

Making a diagnosis of medication-overuse headache is not difficult: it simply requires an accurate history of medication use. This is often best approached by asking how many days in a month there is no medication taken by the patient for headache. Criteria for medication overuse are more than 10 days per month for opioids, triptans or ergotamines and more than 15 days a month for simple analgesics.

The traditional approach to the treatment of patients with medication-overuse headache has involved abrupt withdrawal of the agent in question. However, it is certainly reasonable to counsel patients on the importance of eliminating such medications and to offer migraine prophylaxis to allow them to wean off the offending drug gradually, although, in practice, few patients achieve this.

Abrupt withdrawal is also difficult: it requires fortitude and commitment from the patient who must obviously see the point and want treatment. Even when the overused agent is an opioid, most patients are keen to stop taking it because their dependence on the drug has no recreational element. Naturally, such abrupt withdrawal inevitably causes a severe headache which must be managed in some other way. Outpatient protocols include the use of NSAIDs (e.g. naproxen 500 mg three times a day) or corticosteroids (e.g. prednisolone 60 mg/day

for a week and then taper). Inpatient treatment excludes the patient from day to day responsibilities and permits a wider range of options to control headache, including dihydroergotamine or lignocaine by infusion. Severe withdrawal headaches often settle within two to four days for triptan overuse, four to seven days for ergotamine overuse and seven to 10 days for substantial codeine overuse. The withdrawal phase must be followed by a plan to manage breakthrough headaches without reverting to the offending drugs.

SECONDARY HEADACHES THAT CAN PRODUCE A PATTERN OF CHRONIC DAILY HEADACHE

Although most patients with chronic daily headache have a 'primary' headache with no obvious structural or other cause, some specific conditions that may cause headache should be considered. Pain arising from the neck, sinuses or eyes is usually diagnosed easily. The following conditions also deserve attention.

Intracranial structural lesions

Space-occupying lesions such as tumours may present with headache as the primary complaint. For a lesion to become so large as to cause raised intracranial pressure without obvious focal signs, it must reside in a 'silent area' of the brain (an area not likely to produce obvious physical signs), such as the frontal lobes and anterior temporal lobes. Lesions near the third ventricle, aqueduct or fourth ventricle may be smaller but cause hydrocephalus through ventricular obstruction. Typically, headache caused by raised intracranial pressure is said to be worse in bed or on waking, but this feature is not reliable. Most mass lesions produce a gradually progressive increase in symptoms over weeks or months. Often a careful neurological examination will show abnormalities such as papilloedema or focal signs. Modern imaging, especially MRI, is excellent at revealing such problems

and should be performed if there is any suspicion of a space-occupying lesion.

Idiopathic intracranial hypertension

Formerly called benign intracranial hypertension or pseudotumour cerebri, idiopathic intracranial hypertension typically occurs in overweight young women. Diagnostic clues include symptoms of transient visual obscuration (darkening of vision in one eye) on rising from a stooped position, pulsatile tinnitus, diplopia (from partial sixth nerve palsy) and the finding of papilloedema. Imaging is typically normal, but cerebrospinal fluid pressure measured by lumbar puncture is high (and often extremely high).

Idiopathic intracranial hypertension is an important diagnosis to make because neglecting the condition may result in severe visual loss from prolonged papilloedema. Treatment includes weight loss and acetazolamide at a dose of up to 250 mg four times a day, but surgery (such as optic nerve sheath fenestration or shunting) may be required to save the patient's vision. The pathogenesis is complex but an important mechanism contributing to persistent raised pressure is dynamic narrowing of venous sinuses: the elevated intracranial pressure compresses the sinuses, causing obstruction to venous outflow and thus even higher pressures. This vicious cycle can be addressed by stenting the offending sinus (identified by venography)¹⁵ but the long-term pros and cons of this technique are debated.

Low-pressure headache

Leakage of cerebrospinal fluid from the dural sac can cause headache. This is a well-known condition after lumbar puncture (or when the dura is accidentally punctured in an epidural injection or infusion), when postural headache (present soon after rising and relieved by lying down) is the obvious clue. It is less well known that a similar headache may occur spontaneously. This is usually due to

leakage of cerebrospinal fluid from a nerve root sleeve in the spine. The headache often appears over a day or two (like new daily persistent headache) and has the expected postural features.

MRI scanning of the brain, with contrast, shows a number of characteristic features (including prominent enhancement of the dura) but they may be subtle and not recognised if the clinical suspicion of low cerebrospinal fluid pressure has not been conveyed to the radiologist. Locating the leak in the spine may be difficult and again it is vital to liaise with the radiologist to obtain the best results. Post lumbar puncture headache that does not resolve promptly usually responds well to epidural autologous blood patch. Similar techniques can be used in patients with spontaneous low-pressure headache if the site of the leak can be identified.

Giant cell arteritis

Giant cell arteritis typically occurs after age 55 years. It presents with nonspecific headache (and often diffuse malaise and muscular pain from associated polymyalgia rheumatica). Erythrocyte sedimentation rate and C-reactive protein are usually markedly elevated and are useful screening tests. The diagnosis should be confirmed by temporal artery biopsy; diagnosis only on clinical grounds, such as response to corticosteroids, is unwise because the patient typically will then be committed to corticosteroid use for 12 to 24 months. The diagnosis is important because of the risk of blindness from retinal artery occlusion if untreated. The response to corticosteroids is typically dramatic and, if clinical suspicion is strong, treatment can begin before the biopsy because the histological changes are not disguised by a few days of corticosteroid treatment.

CONCLUSION

Chronic daily headache is a common and debilitating disorder. Accurate diagnosis is not difficult in most cases. Modern

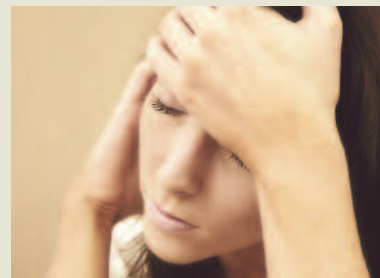
approaches to treatment, with recognition of medication overuse and active management of chronic migraine, may provide substantial relief to many patients. Helping patients with such a disabling condition to improve their quality of life is very rewarding. **MT**

REFERENCES

References are included in the pdf version of this article available at www.medicinetoday.com.au.

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REFERENCES

1. Pascual J, Colas R, Castillo J. Epidemiology of chronic daily headache. *Curr Pain Headache Rep* 2001; 5: 529-536.
2. Headache Classification Subcommittee of the International Headache Society. The International classification of headache disorders. 2nd ed. *Cephalalgia* 2004; 24(Suppl 1): 9-160.
3. Silberstein SD, Lipton RB, Slivinski M. Classification of daily and near-daily headaches: field trial of revised IHS criteria. *Neurology* 1996; 47: 871-875.
4. Dodick DW. Clinical practice. Chronic daily headache. *N Engl J Med* 2006; 354: 158-165.
5. Bigal ME, Lipton RB. The differential diagnosis of chronic daily headaches: an algorithm-based approach. *J Headache Pain* 2007; 8: 263-272.
6. Peres MF, Silberstein SD, Nahmias S, et al. Hemicrania continua is not that rare. *Neurology* 2001; 57: 948-951.
7. Young WB. New daily persistent headache: controversy in the diagnostic criteria. *Curr Pain Headache Rep* 2011; 15: 47-50.
8. Natoli JL, Manack A, Dean B, et al. Global prevalence of chronic migraine: a systematic review. *Cephalalgia* 2010; 30: 599-609.
9. Headache Classification Committee; Olesen J, Bousser MG, Diener HC, et al. New appendix criteria open for a broader concept of chronic migraine. *Cephalalgia* 2006; 26: 742-746.
10. Diener HC, Limmroth V, Katsarava Z. Medication-overuse headache. In: Goadsby PJ, Silberstein SD, Dodick DW, eds. *Chronic daily headache for clinicians*. Hamilton, Ontario: BC Decker; 2005. p. 117-128.
11. Silberstein SD, Lipton RB, Dodick DW, et al; Topiramate Chronic Migraine Study Group. Efficacy and safety of topiramate for the treatment of chronic migraine: a randomized, double-blind, placebo-controlled trial. *Headache* 2007; 47: 170-180.
12. Dodick DW, Turkel CC, DeGryse RE, et al. PREEMPT Chronic Migraine Study Group. OnabotulinumtoxinA for treatment of chronic migraine: pooled results from the double-blind, randomized, placebo-controlled phases of the PREEMPT clinical program. *Headache* 2010; 50: 921-936.
13. Lipton RB, Cady RK, Stewart WF, Wilks K, Hall C. Diagnostic lessons from the spectrum study. *Neurology* 2002; 58(9 Suppl 6): S27-S31.
14. Lance JW, Curran DA. Treatment of chronic tension headache. *Lancet* 1964; i: 1236-1239.
15. Ahmed RM, Wilkinson M, Parker GD, et al. Transverse sinus stenting for idiopathic intracranial hypertension: a review of 52 patients and of model predictions. *AJNR Am J Neuroradiol* 2011; 32: 1408-1414.