



## CEFALEA ed EMICRANIA

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CHILDHOOD AND ADOLESCENT HEADACHE (S EVERS, SECTION EDITOR)



# Epidemiology of Headache in Children and Adolescents—Another Type of Pandemia

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Fig. 1 Presentation of headache prevalence studies worldwide

# Headache in Children

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## Practice Gap

Headache is a common complaint in children and adolescents. Although an efficient, organized, and methodical approach to the patient's history and physical examination is essential, many practitioners are not familiar with a best practices approach to headache. This can result in difficulty with decision making regarding further testing, such as brain imaging, as well as treatment options.

## Objectives

After completing this article, readers should be able to:

1. Recognize key elements of the history and physical examination associated with headaches of various etiologies.
2. Understand the role of neuroimaging in the evaluation of headache in children.
3. Describe the appropriate management of headaches and the roles of abortive therapy and preventive therapy in patients with recurrent headaches.

La Cefalea è un sintomo frequente in Bambini ed Adolescenti

Spesso crea molta ANSIA nel Medico e nei Familiari

STRUMENTI INDISPENSABILI

STORIA CLINICA/ANAMNESI

ESAME NEUROLOGICO MIRATO

INDISPENSABILI PER DISTINGUERE/ORIENTARSI TRA:

CEFALEA PRIMITIVA e CEFALEA SECONDARIA

PRIMITIVA:


Emicrania  
Cefalea Tensiva  
Cefalea cronica giornaliera

SECONDARIA:

Tumori Cerebrali  
Pseudo Tumor Cerebri  
Meningite Cronica  
Idrocefalo  
Ipertensione  
Malattia Febbrile

LA SCELTA DELLE INDAGINI DIAGNOSTICHE DIPENDE  
DA UNA STORIA CLINICA E DA UN ESAME NEUROLOGICO ACCURATI

TABLE 1. Basic Headache Questions

1. When did you first begin having headache(s)?
2. What is the temporal pattern of your headaches? 
  - sudden onset of first lifetime headache
  - episodic headaches, normal in between
  - frequent nonprogressive headaches
  - gradually worsening headaches
  - a mixture of daily headache with episodic worsening
3. Where does your head hurt with your headaches? 
4. What do your headaches feel like (throbbing, pounding, stabbing, squeezing, etc)? pulsante, martellante, lancinante, che stringe
5. What do you do when you get a headache?
6. How long do your headaches typically last?
7. With your headaches do you have:
  - nausea
  - vomiting
  - photophobia
  - phonophobia
  - dizziness
  - numbness
  - weakness
  - double vision
8. Do you get a warning sign or can you tell a headache is coming on?
9. Has a headache ever awoken you at night or is present first thing on awakening?
10. Have you ever had a seizure?
11. Do any activities, foods, or medications make your headaches worse?





# MIGRAINE

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## TRIGGERS



Pollution & Weather



Foods



Alcohol



Sounds



Stress



Lights & Sun glare



Lack of sleep



Medications



## **INCLUSI ANCHE I BAMBINI < 3 anni**

- **INSORGENZA RECENTE (<6 mesi)**
- **PROGRESSIVO AGGRAVAMENTO  
(in INTENSITA' e FREQUENZA)**
- **RISVEGLIO PRECOCE al MATTINO CON CEFALEA O VOMITO**
- **VISIONE DOPPIA**
- **CONVULSIONI**
- **MODIFICHE dell'UMORE, del COMPORTAMENTO, del RENDIMENTO SCOLASTICO**
- **MACCHIE CAFFELATTE O IPOCROMICHE**

TABLE 2. Common Features Seen with Primary and Secondary Headaches

HISTORICAL FEATURE	PRIMARY HEADACHE	SECONDARY HEADACHE
Length of illness	Chronic, >6 mo	Acute, subacute
Temporal pattern	Recurrent or daily	Progressive
Location	Frontal, temporal	Posterior
Quality	Throbbing, squeezing	Pressure
Time of day	Anytime	Early morning, awakening
Frequency/duration	Varied/hours to days	Constant
Nausea/vomiting	Nausea > vomiting	Vomiting > nausea
Visual aura/diplopia	Aura	Diplopia
Photophobia/phonophobia	+++	--

# PRIMARY HEADACHE DISORDERS

The third edition of the International Classification of  
Headache Disorders (ICHD-3)  
Primary and Secondary Headaches

## Primary Headaches

idiopathic or genetic disorders with no known  
secondary cause

## Secondary Headaches

tumors

trauma

increased intracranial pressure

infection

substances or medications



IHS Classification ICHD-3

<https://www.ichd3.org/>



IHS Classification ICHD-3

Search...



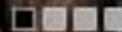
English



PART I

# The Primary Headaches

Primary headaches are caused by themselves. They are caused by abnormalities in the brain, nerves, and muscles. Examples are migraine, tension-type headache, and cluster headache.





How to use the classification

Classification

**Part I: The primary headaches**

1. Migraine

2. Tension-type headache (TTH)

3. Trigeminal autonomic cephalalgias (TACs)

4. Other primary headache disorders

**Part II: The secondary headaches**

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

6. Headache attributed to cranial 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

**The International Classification of Headache Disorders 3rd edition**



On behalf of the Classification Committee of The International Headache Society I am proud to present the **third edition of the International Classification of Headache Disorders (ICHD-3)**. This follows the publication of **ICHD-3 beta** in 2013. The idea behind the beta version was to promote more field testing before presentation of the final ICHD-3, and this has worked well. There have been excellent field-testing studies published, in migraine with aura, cluster headache, idiopathic intracranial hypertension and trigeminal neuralgia among others. It was, for example, documented that the Appendix criteria for A1.2 Migraine with aura were superior to the criteria for 1.2 Migraine with aura in the main body of ICHD-3 beta, better distinguishing this disorder from transient ischemic attacks. Field testing of the novel associated features in criterion C1 for 3.1 Cluster headache, facial flushing and aural fullness, revealed that they did not add to diagnostic discrimination. Consequently, these symptoms are included only in the Appendix of ICHD-3, where they invite further study. These are examples of the evidence-based process of disease classification that now underpins all future changes to the *International Classification of Headache Disorders*.

A contributing reason for the beta version was, as we thought, so that ICHD-3 could when published include the codes of the *International Classification of Diseases, 11<sup>th</sup> edition (ICD-11)*, from the World Health Organization (WHO). We expected that ICD-11 would be finished in 2016, but unfortunately there have been long and unexpected delays so that the final codes are still not available. We therefore have to publish ICHD-3 without them.

ICHD-3 is published as the first issue of *Cephalalgia* in 2018, exactly 30 years after the first edition of the *International Classification of Headache Disorders, ICHD-I* as we now call it. This first version was based primarily upon the opinions of experts, but proved nevertheless to be largely valid. ICHD-II, published in 2004, included a number of changes prompted partly by new evidence and partly by revised opinions of experts. New scientific evidence played a relatively greater role in the changes made in ICHD-3 beta, and all the further changes included in



ICHD-3 beta. *Cephalalgia* 2013; **33**: 629-808  
Society 2013/4

©International Headache



# Classification

## **Part 1:**

Primary headache disorders

## **Part 2:**

Secondary headache disorders

## **Part 3:**

Painful cranial neuropathies and other facial pains

# Classification

## Part 1: The primary headaches

1. Migraine
2. Tension-type headache
3. Trigeminal autonomic cephalalgias
4. Other primary headache disorders

# Classification

## Part 2: The secondary headaches

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

# Classification

## Part 2: The secondary headaches

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 1:

## The primary headaches

- 1. Migraine**
- 2. Tension-type headache**
- 3. Trigeminal autonomic cephalalgias**
- 4. Other primary headache disorders**

# 1. Migraine

- 1.1 Migraine without aura**
- 1.2 Migraine with aura**
- 1.3 Chronic migraine**
- 1.4 Complications of migraine**
- 1.5 Probable migraine**
- 1.6 Episodic syndromes that may be associated with migraine**

# 1.1 Migraine without aura

- A. At least 5 attacks fulfilling criteria B-D
- B. Headache attacks lasting 4-72 h (untreated or unsuccessfully treated)
- C. Headache has  $\geq 2$  of the following characteristics:
  1. unilateral location
  2. pulsating quality
  3. moderate or severe pain intensity
  4. aggravation by or causing avoidance of routine physical activity (eg, walking, climbing stairs)
- D. During headache  $\geq 1$  of the following:
  1. nausea and/or vomiting
  2. photophobia and phonophobia
- E. Not better accounted for by another ICHD-3 diagnosis

# 1.1 Migraine without aura

## *Notes*

- When <5 attacks but criteria B-E are met, code as 1.5.1 *Probable migraine without aura*
- When attacks occur on ≥15 d/mo for >3 mo, code as 1.1 *Migraine without aura* + 1.3 *Chronic migraine*
- When patient falls asleep during migraine and wakes without it, duration is reckoned until time of awakening
- In children and adolescents (aged under 18 y), attacks may last 2-72 h



# “Not better accounted for by another ICHD-3 diagnosis”

## *Note*

This is the last criterion for every headache disorder

- Consideration of other possible diagnoses (the differential diagnosis) is a routine part of the clinical diagnostic process.
- When a headache appears to fulfil the criteria for a particular headache disorder, this last criterion is a reminder always to consider other diagnoses that might better explain the headache.

## Migraine

Migraine is the most common primary headache type with an overall prevalence of 9.1%

and a

range reported of 1.2% (young children) to 23% (adolescents)

is one of the most common reasons for referral to a pediatric neurologist.

Approximately 20% of migraines can be associated with a preceding aura, which is typically visual but may include numbness, weakness, dysarthria, coordination difficulties, and confusion.

The impact that frequent migraines can have on a child or young adult is significant. Children with migraine, and in particular the subset with chronic daily headache, have lower quality of life scores on the Pediatric Quality of Life Inventory similar to children with arthritis and cancer. (7)

# 1.2.1 Migraine with typical aura

- A. At least 2 attacks fulfilling criteria B and C
- B. Aura of visual, sensory and/or speech/language symptoms, each fully reversible, but no motor, brainstem or retinal symptoms
- C.  2 of the following 4 characteristics:
  - 1.  1 aura symptom spreads gradually over  $\geq 5$  min, and/or  2 symptoms occur in succession
  - 2. each individual aura symptom lasts 5-60 min
  - 3.  1 aura symptom is unilateral
  - 4. aura accompanied or followed in  $< 60$  min by headache
- D. Not better accounted for by another ICHD-3 diagnosis, and TIA excluded

# Tension-Type Headache

*Tension-type headaches are common in the pediatric population and, in general, are less severe than migraine headaches.*

*Many patients with tension-type headaches may go unnoticed because often they do not bring it up as a primary concern at health-care visits.*

## 2. Tension-type headache (TTH)

2.1 Infrequent episodic tension-type headache

2.2 Frequent episodic tension-type headache

2.3 Chronic tension-type headache

2.4 Probable tension-type headache

## 2.1 Infrequent episodic TTH

- A. At least 10 episodes of headache occurring on <1 d/mo (<12 d/y) and fulfilling criteria B-D
- B. Lasting from 30 min to 7 d
- C.  $\geq 2$  of the following 4 characteristics:
  1. bilateral location
  2. pressing or tightening (non-pulsating) quality
  3. mild or moderate intensity
  4. not aggravated by routine physical activity
- 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

## Chronic Daily Headache

Chronic daily headache is typically a combination of chronic migraine and chronic tension-type headaches.

“Headache occurring on 15 or more days per month for more than 3 months which has the features of migraine headache on at least 8 days per month” is considered to be chronic migraine.

## The diagnostic criteria for chronic daily headache are as follows

- A. Headache (migraine-like or tension-type-like) on 15 or more days per month for longer than 3 months and fulfilling criteria B and C
- B. Occurring in a patient who has had at least 5 attacks fulfilling criteria B through D for migraine without aura and/or criteria B and C for migraine with aura
- C. On at least 8 days per month for more than 3 months, fulfilling any of the following: 1) criteria C and D for migraine without aura, 2) criteria B and C for migraine with aura, and 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



# **Episodic syndromes that maybe associated with migraine**

**Recurrent gastrointestinal  
disturbance**

**Cyclic vomiting syndrome**

**Abdominal migraine**

**Benign paroxysmal vertigo**

**Benign paroxysmal torticollis**

## The diagnostic criteria for abdominal migraine are as follows :

A. At least 5 attacks of abdominal pain fulfilling criteria B through D

B. Pain has at least 2 of the following 3 characteristics: midline location, periumbilical or poorly localized; dull or “just sore” quality; and moderate or severe intensity

C. At least 2 of the following 4 associated symptoms or signs: anorexia, nausea, vomiting, and pallor

D. Attacks last 2 to 72 hours when untreated or unsuccessfully treated

E. Complete freedom from symptoms between attacks

F. Not attributed to another disorder

The diagnostic criteria for cyclical vomiting syndrome are as follows:

- A. At least 5 attacks of intense nausea and vomiting, fulfilling criteria B and C**
- B. Stereotypical in the individual patient and recurring with predictable periodicity**
- C. All of criteria D through H**
- D. Nausea and vomiting occur at least 4 times per hour**
- E. Attacks last at least 1 hour, up to 10 days**
- F. Attacks occur at least 1 week apart.**
- G. Complete freedom from symptoms between attacks**
- H. Not attributed to another disorder**

# Medication-overuse headache (MOH)

- A. Headache occurring on  $\geq 15$  d/mo in a patient with a pre-existing headache disorder
- B. Regular overuse for  $> 3$  mo of one or more drugs that can be taken for acute and/or symptomatic treatment of headache
- C. Not better accounted for by another ICHD-3 diagnosis

## INDAGINI

ESAME NEUROLOGICO NELLA NORMA  
ASSENZA di RED FLAGS  
STORIA di LUNGA DURATA di CEFALEE RICORRENTI

ANALISI di LABORATORIO  
EEG  
TC CRANIO  
RM ENCEFALO

STORIA di RECENTE INSORGENZA E/O  
PRESENZA DI RED FLAGS E/O  
ESAME NEUROLOGICO PATOLOGICO

RM ENCEFALO  
ANGIO RM ARTERIOSA VENOSA

SOSPETTO ANEURISMA RMA

SOSPETTO DI TROMBOSI,  
STENOSI SENI VENOSI  
RMV

SOSPETTO di IPERTENSIONE ENDOCRANICA, INFIAMMAZIONE  
PUNTURA LOMBARE

# Practice guideline update summary: Acute treatment of migraine in children and adolescents

Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology and the American Headache Society

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*Neurology*<sup>®</sup> 2019;93:1-13. doi:10.1212/WNL.00000000000008095

## TERAPIA E TRATTAMENTO di CEFALEA ED EMICRANIA IN ETA' EVOLUTIVA

MULTIMODALE: STILE DI VITA  
FARMACI dell'ACUZIE  
PREVENZIONE  
TERAPIE COMPLEMENTARI  
INTERVENTI PROCEDURALI

STILE DI VITA: ELETTRODOMESTICI NOTTURNI  
IGIENE del SONNO SCADENTE  
SCARSA IDRATAZIONE  
ALIMENTAZIONE IRREGOLARE  
ABUSO di CAFFEINA  
RIDOTTA o ASSENTE ATTIVITA' FISICA  
STRESS DEPRESSIONE  
ABUSO di ANTIDOLORIFICI

## QUALCHE CONSIGLIO

**SONNO**: a che ora si va a dormire , si dorme la notte o anche durante il giorno,  
apnee notturne, dispositivi elettronici a letto

**IDRATAZIONE**: bere tanto da avere almeno 6 (sei) minzioni al giorno

**ALIMENTAZIONE**: mangiare sano, non saltare i pasti, peso forma, attenzione a cibi, bevande, additivi

**VALUTARE/INDAGARE**: stress, ansia, depressione (...avviare interventi idonei)

**PREVENIRE/EDUCARE**: abuso di farmaci antidolorifici

( se presente, sospensione per almeno due settimane, se la sospensione riaccende il dolore prevedere un breve periodo con metilprednisolone)

**DIARIO DELLE CEFALIEE**: incidenza delle crisi dolorose, fattori scatenanti



**TABLE 3. Diet and Headaches**

Dietary triggers for headaches:

1. Caffeine (soda, coffee, tea)
2. MSG and soy products
3. Chocolate
4. Nitrite-containing foods (hot dogs, lunch meats, sausage)
5. Artificial sweeteners (saccharin, aspartame)
6. Some cheeses/dairy (aged cheeses, sour cream, yogurt, whole milk, buttermilk, ice cream)
7. Nuts and nut butter (peanut butter, peanuts)
8. Vinegar and vinegar-containing condiments (ketchup, mustard, mayonnaise)
9. Certain fruits/juices (citrus fruit, raisins, raspberries, red plums, papayas, passion fruit, dates, avocados)
10. Certain vegetables (lima beans, fava beans, navy beans, sauerkraut, pea pods, lentils)
11. Fresh yeast in baked goods (bagels, doughnuts, sourdough, pizza dough, soft pretzels, coffee cake)
12. Snack foods (TV dinners, chips)
13. Beer and wine

Safe alternative foods:

1. American or cottage cheese, low-fat milk
2. Pasta, potatoes, rice cereal
3. Lamb, chicken
4. Broccoli, cauliflower, cabbage
5. Apples
6. Jelly, jam, hard candy, honey
7. Gelatin, sherbet, cookies

# **Use of the Migraine Disability Assessment Questionnaire in Children and Adolescents With Headache: An Italian Pilot Study**

D. D'Amico, MD; L. Grazzi, MD; S. Usai, MD; F. Andrasik, PhD; M. Leone, MD;  
A. Rigamonti, MD; G. Bussone, MD

*(Headache 2003;43:767-773)*

**Table 1.—Migraine Disability Assessment Scores (MIDAS) at Baseline and Retest**

Question	Baseline, mean (SD)	Retest, mean (SD)	Spearman Rank Correlation Coefficient	<i>P</i> Value
(1) How many days in the last 3 months did you miss work or school because of your headaches?	3.5 (5.9)	3.3 (5.3)	0.72	<.001
(2) How many days in the last 3 months was your productivity at work or school reduced by half or more because of headaches?	6.3 (14.3)	6.7 (14.6)	0.66	<.001
(3) How many days in the last 3 months did you NOT do housework because of your headaches?	2.7 (9.0)	2.2 (4.7)	0.46	<.001
(4) How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches?	1.8 (5.8)	2.7 (8.2)	0.32	<.002
(5) How many days in the last 3 months did you miss family, social, or leisure activities because of your headaches?	3.5 (5.3)	3.3 (5.1)	0.65	<.001
MIDAS disability score	17.8 (33.1)	18.2 (25.5)	0.72	<.001
(A) How many days in the last 3 months did you have headache?	32 (31)	29.3 (30)	0.83	<.001
(B) On a scale of 0-10, on average how painful were these headaches?	6.9 (1.6)	6.5 (1.9)	0.46	<.001

## Headache

**Table 4.—Distribution of Migraine Disability Assessment (MIDAS) Grades in Study Participants at Baseline and Retest**

Study Participants	MIDAS Disability Grade	No. (%) of Patients	
		Baseline	Retest
All patients (N = 95)	I	39 (41.1)	37 (38.9)
	II	16 (16.8)	15 (15.8)
	III	15 (15.8)	15 (15.8)
	IV	25 (26.3)	28 (29.5)
Migraine (n = 27)	I	11 (40.8)	11 (40.8)
	II	4 (14.8)	6 (22.2)
	III	5 (18.5)	3 (11.1)
	IV	7 (25.9)	7 (25.9)
Episodic tension-type headache (n = 33)	I	16 (48.5)	16 (48.5)
	II	6 (18.2)	2 (6.1)
	III	4 (12.1)	6 (18.2)
	IV	7 (21.2)	9 (27.2)
Chronic tension-type headache (n = 22)	I	9 (40.9)	7 (31.8)
	II	3 (13.6)	6 (27.3)
	III	4 (18.2)	1 (4.5)
	IV	6 (27.3)	8 (36.4)
Migraine plus episodic tension-type headache (n = 13)	I	3 (23.1)	3 (23.1)
	II	3 (23.1)	1 (7.7)
	III	2 (15.4)	5 (38.4)
	IV	5 (38.4)	4 (30.8)

TABLE 4. Common Abortive Therapy Options

MEDICATION <sup>a</sup>	DOSING RANGE	ADVERSE EFFECTS; WARNINGS	INDICATIONS FOR USE/OTHER INFORMATION
Ibuprofen	10 mg/kg – max 800 mg Q6h	GI upset, bleeding, kidney dysfunction	First line
Naproxen	10–20 mg/kg – max 500 mg Q12h	GI upset, bleeding, kidney dysfunction	First line, longer period of action
Acetaminophen	15 mg/kg – max 1,000 mg Q8h or 3,000 total mg/day	Liver dysfunction	First line, especially in patients with contraindication or sensitivity to nonsteroidal anti-inflammatory drugs
Ketorolac	0.5 mg/kg PO or IV – max 10 mg PO Q6h or 30 mg IV Q6h	GI upset, bleeding, kidney dysfunction	Often used first line in ED as part of a "migraine cocktail" with fluids and antiemetic agent
Metoclopramide	0.2 mg/kg PO or IV – max 10 mg Q6h	Somnolence, extrapyramidal adverse effects	Diphenhydramine can be used for pretreatment to prevent extrapyramidal effects
Prochlorperazine	0.15 mg/kg PO or IV – max 10 mg Q6h	Somnolence, extrapyramidal adverse effects, dizziness	Diphenhydramine can be used for pretreatment to prevent extrapyramidal effects
Diphenhydramine	1 mg/kg IV or PO – max 50 mg Q4h	Somnolence, paradoxical activation	
Valproic acid	15 mg/kg IV – max 1,000 mg Q12h	Somnolence, GI upset; avoid in patients with hepatic dysfunction and pregnant patients	Typically used second line in ED if initial cocktail ineffective

## Triptans

Almotriptan	6.25 or 12.5 mg – max 25 mg/day	Fatigue, somnolence, flushing, chest pain, paresthesia; do not use in patients with arrhythmia, coronary artery disease, stroke, hemiplegic migraine, migraine with brainstem aura, poorly controlled hypertension, use of ergot derivative within previous 24 h; serotonin syndrome risk when using in patients taking SSRIs	Use after or in conjunction with analgesic agents; do not use >2 days per week
Rizatriptan	5 or 10 mg ODT – max 20 mg/day	Same as above	Same as above
Frovatriptan	2.5 mg – max 5 mg/day	Same as above	Same as above
Naratriptan	1 or 2.5 mg – max 5 mg/day	Same as above	Same as above
Zolmitriptan	Nasal 5 mg, 2.5 or 5 mg ODT – max 10 mg/day	Same as above	Same as above
Eletriptan	20 or 40 mg – max 80 mg/day	Same as above	Same as above
Sumatriptan	Nasal 5 or 20 mg – max 40 mg/day Oral 25, 50, 100 mg – max 200 mg/day	Same as above	Same as above

ED=emergency department, GI=gastrointestinal, IV=intravenous, max=maximum, ODT=orally disintegrating tablet, PO=orally, Q4/6/8/12h=every 4/6/8/12 hours, SSRI=selective serotonin reuptake inhibitor.

<sup>a</sup>Providers should be aware that many of these medications are not Food and Drug Administration (FDA) approved for migraine or headache treatment in the pediatric age group.

Adapted from Klein J, Oakley C. Migraine and headaches in children. In: Johnston MV, Adams HP, Fatemi A, eds. Neurobiology of Disease. 2nd ed. Oxford, NY: Oxford University Press; 2016:540–546. (14)

TAB. I. Terapia sintomatica per l'emicrania in età evolutiva:  
analgesci e FANS.

Farmaco	Età	Posologia
Paracetamolo*	Non limitazioni	15 mg/kg
Ibuprofene*	> 6 mesi	7,5-10 mg/kg
Ketoprofene	> 6 aa	1-2 mg/kg
Diclofenac	> 6 aa	0,5-1 mg/kg
Piroxicam	> 6 aa	10-20 mg
Naprossene	> 16 aa	500 mg
Ac. acetilsalicilico	> 16 aa	10-15 mg/kg
Indometacina	> 16 aa	25-50 mg
Nimesulide	> 18 aa	1-2 mg/kg

***(Gior Neuropsich Età Evol 2012;32:45-55)***

TAB. II. Terapia sintomatica per l'emicrania in età evolutiva:  
farmaci antiemetici.

<i>Farmaco</i>	<i>Via di somministrazione</i>	<i>Posologia</i>
Metoclopramide	os/ev	0,1-0,3 mg/kg
Domperidone	os/rettale	0,3-0,6 mg/kg
Proclorperazina	os/rettale/ev	2,5-5 mg 0,15 mg/kg



## Procedural Interventions

Procedural interventions are typically used when other therapies have not yielded relief. These include nerve blocks (occipital, sphenopalatine, trigeminal, etc), botulinum toxin, transcutaneous electrical nerve stimulation, and migraine surgery. There is limited experience with these procedural interventions in children and adolescents. Migraine surgery is considered by many as still experimental, and the American Headache Society cautions general use.

## Results

There is evidence to support the efficacy of the use of ibuprofen, acetaminophen (in children and adolescents), and triptans (mainly in adolescents) for the relief of migraine pain, although confidence in the evidence varies between agents. There is high confidence that adolescents receiving oral sumatriptan/naproxen and zolmitriptan nasal spray are more likely to be headache-free at 2 hours than those receiving placebo. No acute treatments were effective for migraine-related nausea or vomiting; some triptans were effective for migraine-related phonophobia and photophobia.

## Recommendations

Recommendations for the treatment of acute migraine in children and adolescents focus on the importance of early treatment, choosing the route of administration best suited to the characteristics of the individual migraine attack, and providing counseling on lifestyle factors that can exacerbate migraine, including trigger avoidance and medication overuse.



TABLE 5. Common Preventive Therapy Options

MEDICATION <sup>a</sup>	DOSING RANGE	ADVERSE EFFECTS; WARNINGS	FAVORABLE QUALITIES
Antihistamines			
Cyproheptadine	2–4 mg PO QHS – max 8 mg Q8-12h	Increased appetite, weight gain, somnolence	In general, is well tolerated
Antidepressants/ anxiolytics			
Amitriptyline	10 mg PO QHS – max 50 mg BID	Somnolence, dizziness, overdose may cause cardiotoxicity, risk of suicidal ideation, must be weaned	Can help sleep initiation; may stabilize mood at a high dose
Nortriptyline	25 mg PO QHS – max 50 mg BID	Same as above	Same as above; may be helpful for chronic widespread pain
Duloxetine	20 mg PO QHS – max 80 mg daily	GI upset, risk of suicidal ideation; can lead to serotonin syndrome or dystonia if used with metoclopramide; can lead to hyponatremia, SIADH, hypotension, serotonin syndrome if used with prochlorperazine; must be weaned	May be helpful for chronic widespread pain; may improve anxiety
Venlafaxine extended release	37.5 mg PO daily – max 150 mg daily	Constipation, dry mouth, risk of suicidal ideation, can lead to serotonin syndrome or dystonia if used with metoclopramide, must be weaned	Same as above; can be helpful for dizziness

## Antiepileptics

Topiramate	15 mg PO QHS – max 100 mg BID but typical max dose used for headache is 50 mg BID	Cognitive dysfunction, paresthesia, weight loss, kidney stones, decreased perspiration, metabolic acidosis	Especially useful in overweight/obese patients; can be used for dual purposes in patients who also have epilepsy
Zonisamide	25 mg PO QHS – max 50 mg BID	Contraindicated in patients with a sulfa allergy	In general adverse effects are similar to but less severe than those for topiramate
Acetazolamide	10 mg/kg per day divided BID-TID or 250 mg BID – max 4,000 mg/day	Paresthesia, urinary frequency, metabolic acidosis, electrolyte derangement (hyponatremia, hypokalemia)	Useful in some patients with hemiplegic migraine
Divalproex	10 mg/kg per day PO (usually divided BID) – max 40 mg/kg per day divided BID or 750 mg BID	Teratogenicity, weight gain, hair and skin changes, tremor, liver dysfunction, requires laboratory monitoring (particularly liver function tests and platelets)	Can be used for dual purposes in patients who also have epilepsy, mood stabilizer
Gabapentin	10 mg/kg per day divided TID – max 35 mg/kg per day divided TID or 900 mg TID	Weight gain, somnolence, easy bruising, caution if renal impairment	May help other neuropathic pain, helps with sleep initiation; can be used for dual purposes in patients who also have epilepsy



who also have epilepsy

Antihypertensives

Propranolol	1 mg/kg per day PO (daily or divided BID) – max 4 mg/kg per day	Bradycardia, hypotension, decreased exercise tolerance, erectile dysfunction; contraindicated in patients with poorly controlled asthma, diabetes; caution in depression as can worsen mood	In general, is well tolerated
Nadolol	20 mg PO daily – max 120 mg daily	Same as above	

TABLE 5. (Continued)

MEDICATION <sup>a</sup>	DOSING RANGE	ADVERSE EFFECTS; WARNINGS	FAVORABLE QUALITIES
Verapamil extended release	4 mg/kg per day PO daily – max 8 mg/kg per day or 480 mg daily	Hypotension, constipation, leg edema	Useful in some patients with hemiplegic migraine

*BID=twice daily, GI=gastrointestinal, IV=intravenous, max=maximum, ODT=orally disintegrating tablet, PO=orally, QHS=every night at bedtime, Q8-12h=every 8 to 12 hours, SIADH=syndrome of inappropriate antidiuretic hormone secretion, TID=3 times daily.*

<sup>a</sup>*Providers should be aware that not all of these medications are Food and Drug Administration (FDA) approved for migraine or headache treatment in the pediatric age group.*

*Adapted from Klein J, Oakley C. Migraine and headaches in children. In: Johnston MV, Adams HP, Fatemi A, eds. Neurobiology of Disease. 2nd ed. Oxford, NY: Oxford University Press; 2016:540–546. (14)*

## TAB. III. Terapia profilattica per l'emicrania in età evolutiva: farmaci preventivi.

Farmaco	Posologia	Numero somm./die
Propranololo*	1-3 mg/kg	2-3
Flunarizina*°	5 mg	1
Pizotifene*	1-1,5 mg	2-3
Amitriptilina	0,5-1 mg/kg	1-2
Trazodone*	1 mg/kg	1-2
Valproato*	10-30 mg/kg	2-3
Topiramato*°	1-1,5 mg/kg	2-3

- \*Studi controllati;
- °Farmaco > placebo