Migraines in Children

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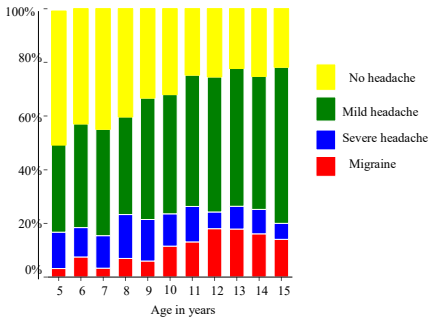
Prevalence of headache in schoolchildren

≥ 1 headache over 1 year	50-70%
Migraine	10.6%
Chronic TTH	0.9%
Episodic TTH	18-25%

Several European studies



Aberdeen schoolchildren
(Abu-Arafeh and Russell, BMJ, 1994)

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- **Disease and headache Characteristics**
  - Duration of illness
  - Frequency of attacks
  - Duration of each attack
  - Severity of pain (interference with activities)
  - Location of maximal pain
  - Quality of pain
- **Trigger factors**
- **Warning symptoms**

- **Symptoms during attacks**
  - Anorexia
  - Nausea
  - Vomiting
  - Light intolerance
  - Noise intolerance
  - Pallor
  - Physical activities
- **Relieving factors**
- **Symptoms between attacks**

Evaluation of the child with headache: The Clinical History

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Types of Headaches

- **Tension headache.** These are the most common type of headache. Stress and mental or emotional conflict can trigger tension headaches.
- **Migraine.** Migraines may start early in childhood. Researchers estimate that nearly 1 in 5 teens has migraine headaches. The average age they can start is 7 years old for boys and 10 years old for girls. There is often a family history of migraines. Some girls may have migraines that happen with their menstrual periods.
- **Cluster headaches.** Cluster headaches usually occur in a series that may last weeks or months. This series of headaches may return every 1 to 2 years. These headaches are much rarer than tension headaches or migraines. They can start in children older than age 10. They are more common in teen boy

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Which children are at risk for headaches?

- A child is more at risk for headaches if he or she has any of the following:
- Stress
- Poor sleep
- Head injury
- Family history of migraines

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What are the symptoms of headaches in a child?

- Symptoms can occur a bit differently in each child.
- Symptoms of tension headaches can include:
- Pain that starts slowly
- Head hurting on both sides
- Pain that is dull
- Pain that feels like a band around the head
- Pain in the back part of the head or neck
- Pain mild to moderate, but not severe
- Change in the child's sleep habits

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Signs and symptoms of migraines can include:

- Pre-migraine symptoms (an aura) such as seeing flashing lights, a change in vision, or funny smells
- Pain on one or both sides of the head
- Pain that may be throbbing or pounding
- Sensitivity to light or sound
- Nausea and vomiting
- Belly pain discomfort
- Sweating
- Child looking pale and being quie

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Cluster Headaches

- Severe pain on one side of the head, usually behind one eye
- The eye that is affected may have a droopy lid, small pupil, or redness and swelling of the eyelid
- Runny nose or congestion
- Swelling of the forehead

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Symptoms of a secondary headache may include:

- Headaches that start very early in the morning
- Pain that is made worse by coughing or sneezing
- Sudden onset of pain
- Severe pain
- Headache that is becoming more severe or continuous
- Personality changes along with headache
- Changes in vision
- Weakness in the arms or legs, or balance problems
- Seizures or epilepsy
- Recurrent episodes of vomiting without nausea or other signs of a stomach virus
- A very young child with a headache
- A child that is awakened by the pain of a headach

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Evaluation of the child with headache: The Clinical Examination

- General examination should include
  - Weight
  - Height
  - Head circumference
  - BP
- Neurological examination should include:
  - Cranial nerves and optic disc inspection
  - Eye movement, nystagmus
  - Muscle co-ordination, ataxia, tremor etc.

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Prospective Headache diary

Name: Date of birth:
Address: Sex:

Attack number	1	2	3	4
Date				
Time started				
Time resolved				
Severity of headache*				
Type of headache**				
What may started it?				
Any loss of appetite?				
Nausea?				
Vomiting?				
Does light make it worse?				
Does noise make it worse?				
Is it worse by walking?				
Does rest make it better?				
Does sleep make it better?				
Is it better after paracetamol?				

1 normal activities
2 stop some activities
3 stops all activities

Throbbing, hitting, banging, Tightness, pressure, squeeze, sharp, stab, dull, or can't describe

www.bpna.org.uk

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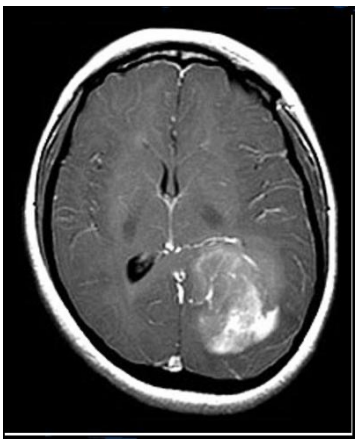
Excluding brain tumours



Luckily IT IS RARE

1-5 /100,000 children/year
Miltenburg etal. CJNS, 1996

2000-5000/100,000 have migraine

≈1/1000 of children with chronic headache as the only symptom, attending a specialist clinic
Abu-Arafeh & McLeod, ADC, 2005

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Relationship between headache and brain tumour?

- Almost all children with brain tumour have headache at some stage
- The vast majority of children with headache have no brain tumour
- Childhood Brain Tumor Consortium
  - 3291 children with brain tumors
  - 62% had headache prior to diagnosis
  - 98% had ≥ 1 other associated sign or symptom
  - >50% had ≥ 3 other associated signs or symptoms

J Neurooncol. 1991

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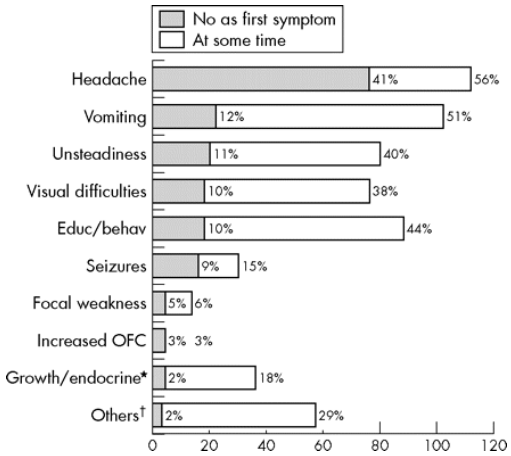
Frequency of symptoms in 200 children with brain tumours



Wilne et al, ADC, 2006

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Associated symptoms in children with headache

Symptom	Headache<4 months (n = 68)	Headache≥4 months (n = 38)
Vomiting	87%	76%
Vision	53	63
Unsteadiness	49	45
Education /behavioural	37	45
Disturbed sleep	26	31
Growth/fluid balance	7	21
Seizures	7	8
None	**0**	**0**

Wilne et al, ADC, 2006

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Indications for Neuroimaging

Features of cerebellar dysfunction:	Ataxia Nystagmus Intention tremor
Increased intracranial pressure:	Papilloedma Night/early morning vomiting Large head
Focal new neurological deficits:	Recent squint Focal seizures
Personality change	
Deterioration in school work	
Atypical headaches or migraine	

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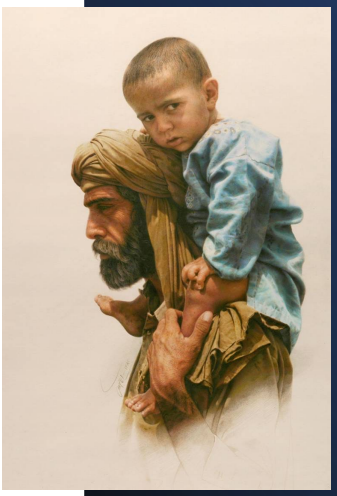
Chronic sinusitis and headache

Common misdiagnosis

Sinusitis as detected on cranial CT scan is mostly a coincidental finding in adolescents with chronic primary headache

Treatment of sinusitis did not improve headache

Şenbil et al. J headache Pain 2008



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- **Childhood Migraine**

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Classification of migraine ICHD-II, Cephalalgia, 2004

- 1.1 Migraine without aura
- 1.2 Probable migraine without aura
- 1.3 Migraine with aura
  - 1.3.1 Typical aura with migraine headache
  - 1.3.2 Typical aura with non-migraine headache
  - 1.3.3 Typical aura without headache
  - 1.3.4 Familial hemiplegic migraine
  - 1.3.5 Sporadic hemiplegic migraine
  - 1.3.6 Basilar artery migraine
- 1.4 Probable migraine with aura
- 1.5 Childhood periodic syndromes
  - 1.5.1 Cyclical vomiting
  - 1.5.2 Abdominal migraine
  - 1.5.3 Benign Paroxysmal vertigo of childhood
- 1.6 Retinal Migraine
- 1.7 Complications of migraine
  - 1.7.1 Chronic migraine
  - 1.7.2 Status migrainosus
  - 1.7.3 Persistence aura without infarction
  - 1.7.4 Migraine infarction
  - 1.7.5 Migraine triggered seizures

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Childhood migraine – what is different Diagnostic criteria, ICHD-II, Cephalalgia, 2004

Migraine without aura

A. At least 5 attacks fulfilling B-D

B. Headache lasting **1-72 in children**

C. Headache has at least two of the following characteristics:

1. Unilateral location
2. Pulsating quality
3. moderate or severe intensity
4. Aggravation by walking or similar routine activity.

D. During headache at least one of the following:

1. Nausea and/or vomiting.
2. Photophobia and phonophobia.

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Childhood migraine – what is different
Reasons for seeking medical advice:

- Children should not have headache
- Time lost off school
- Treatment is not helpful
- Headache has been going on for a long time
- Worry about a serious disease?

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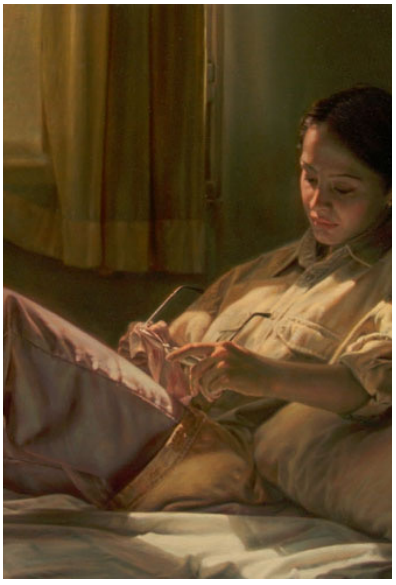
Childhood migraine – what is different

Duration of migraine attacks

- Variable, but generally shorter than in adults
- Around 10% of migraine attacks are less than 2 hours

Abu-Arafeh, Cephalalgia, 2001



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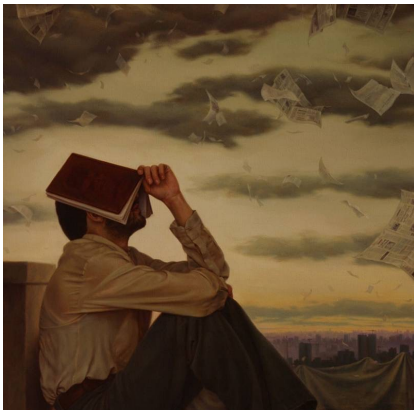
Childhood migraine – what is different

Site of maximum pain

- Unilateral headache is less common than in adults
- Frontal headache in at least 50% of patients



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Childhood migraine – what is different

Quality of pain

- Allow children to use their own words
- Most children under the age of 8 can't describe pain
- Good description of pain can be expected in majority of children over 12 years

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Childhood migraine – what is different

Severity of pain

- best assessed by behaviour during attacks
- **Mild**: Does not interfere with activities
- **Moderate**: Stops some but not all activities
- **Severe**: Stops all activities (child lies in bed)

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Childhood migraine – what is different

Trigger factors

- None identifiable in the majority of children
- Food trigger are uncommon
- Missing meals and sleep, stress and anxiety are likely

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Childhood migraine – what is different

Mixed headaches:

- Migraine with aura and migraine without aura can coexist
- 10-20% of patient with migraine also have tension type headache

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Childhood migraine – what is different

Associated symptoms:

- **Nausea** is common in children (90% of attacks)
- **Vomiting** is also common and an early feature (60%)
- **Dizziness** reported by more than 50% of children with migraine
- **Abdominal pain** also common (25%)

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Childhood migraine – what is different

- **Migraine with aura**
- **"Alice in wonderland"**
  - Distorsion of images
  - Micropsia
  - Macropsia
  - Déja vu

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Childhood migraine – what is different

Response to treatment

- Unpredictable
- Attack to attack variation
- Large placebo effect

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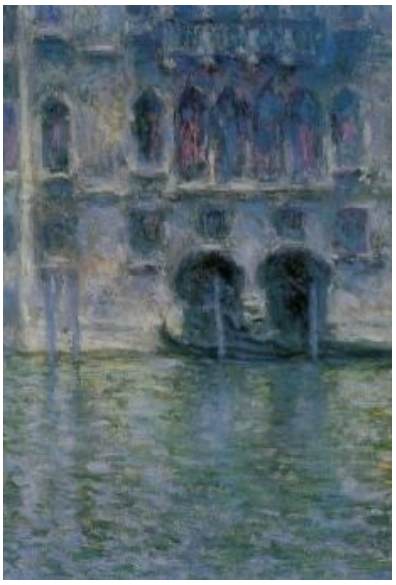
Principles of pharmacologic treatment

- As early as possible after onset of symptoms
- Most suitable drug
- Most effective dose
- Most reliable route of administration



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Response to Acute treatment AAN, Neurology, 2004

Drug, doses, ages	Class	n	Efficacy: Active, %	Efficacy: Placebo, %	Efficacy: *p* Value	Adverse effects
NSAIDs and nonopiate analgesics						
Ibuprofen						
10 mg/kg (4–16 y)	I	88	68	37	<0.05*	Infrequent
7.5 mg/kg (6–12 y)	I	84	76	53	0.006	Infrequent
Acetaminophen 15 mg/kg (4–16 y)	I	88	54	37	<0.05*	Infrequent
Triptans						
Sumatriptan						
Nasal 20 mg (6–14 y)	I	14	85.7	42.8	0.03	Occasional to frequent
5, 10, 20 mg (12–17 y)	I	510	66†	53	0.05	
10, 20 mg (8–17 y)	I	83	64	39	0.003	
Oral (50, 100 mg (8–16 y)	I	23	30	22	NS	Occasional
Subcutaneous						
3, 6 mg (6–16 y)	IV	17	64	—	—	Occasional to frequent
0.06 mg/kg (6–18 y)	IV	50	78	—	—	
Oral triptans						
Rizatriptan 5 mg (12–17 y)	I	296	66	56	NS	Occasional
Zolmitriptan 2.5, 5 mg (12–17 y)	IV	38	85 (2.5 mg)	—	—	Occasional
			70 (5 mg)		—	

* Exact *p* values not provided.
† 5 mg dose—66% ($p < 0.05$), 20 mg dose—63% ($p = 0.059$).
NSAIDs = non-steroidal anti-inflammatory drugs; NS = nonsignificant.

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Other drugs used in treatment of acute migraine, but no clinical studies …..

NSAID

Diclofenac

Mefenamic acid

Apirin (over 15 years age)

Naproxen

Opiate

Codeine ± paracetamol, aspirin

Meperadine

Other triptans

Naratriptan	Naramig (GSK)
Rizatriptan	Maxalt (MSD)
Zolmtriptan	Zomig (Astra Z)
Eletriptan	Relpax (Pfizer)

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ADC, 2007

PHARMACY UPDATE

MEDICINES FOR MIGRAINE

Steve Ryan

Arch Dis Child Educ Pract Ed 2007;92:ep50–ep55. doi: 10.1136/adc.2004.066670

REVIEW ARTICLE

Pediatrics, 2005

Symptomatic Treatment of Migraine in Children: A Systematic Review of Medication Trials

Léonie Damen, PhD*; Jacques K. J. Bruijn, MD‡§; Arianne P. Verhagen, PhD*; Marjolein Y. Berger, MD PhD*; Jan Passchier, PhD‖; and Bart W Koes, PhD*

Special Article

AMERICAN ACADEMY OF NEUROLOGY

Neurology, 2004

CME **Practice Parameter: Pharmacological treatment of migraine headache in children and adolescents**

Report of the American Academy of Neurology Quality Standards Subcommittee and the Practice Committee of the Child Neurology Society

D. Lewis, MD; S. Ashwal, MD; A. Hershey, MD; D. Hirtz, MD; M. Yonker, MD; and S. Silberstein, MD

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Preventative treatment of migraine

Avoidance of known trigger factors if possible

Dietary advice

Advice on healthy life style:

- **Regular meals**
- **Regular sleep**
- **Regular exercise and rest**

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Childhood migraine – what is different

Childhood Syndromes Related to Migraine

- Benign Paroxysmal Torticollis
- Benign paroxysmal Vertigo
- Cyclical Vomiting Syndrome
- Abdominal Migraine

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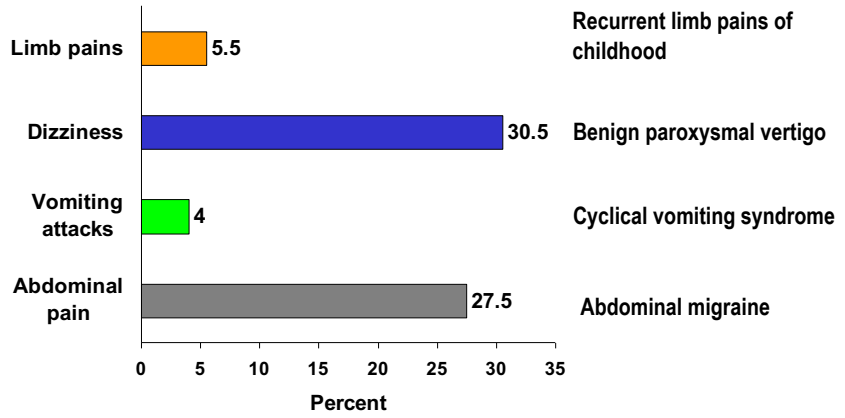
Migraine - "More than a Headache"



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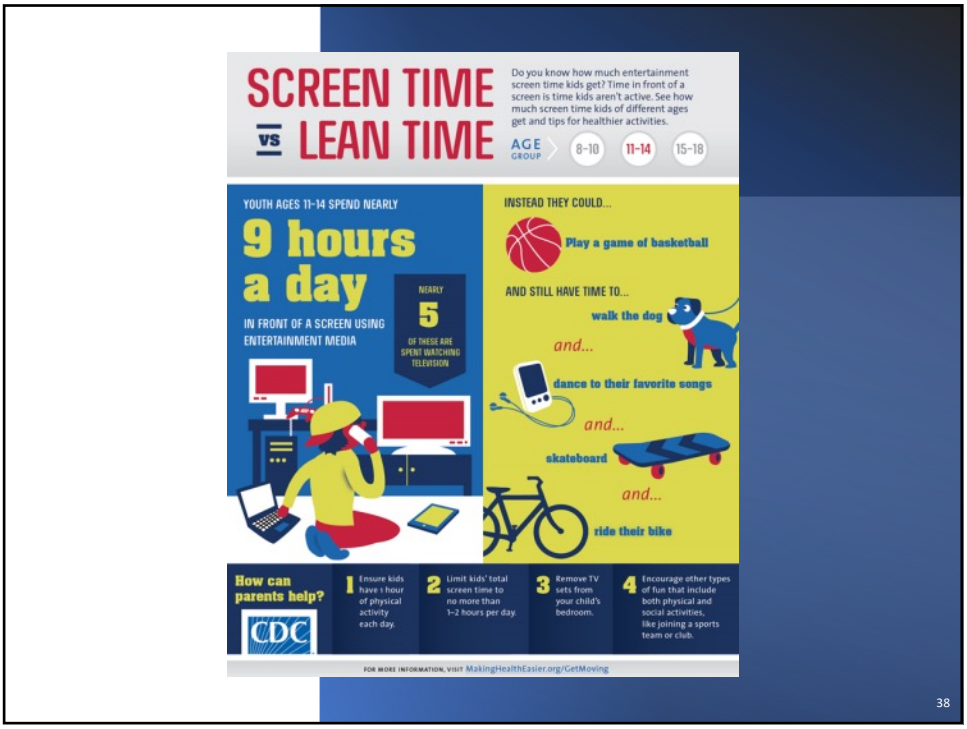

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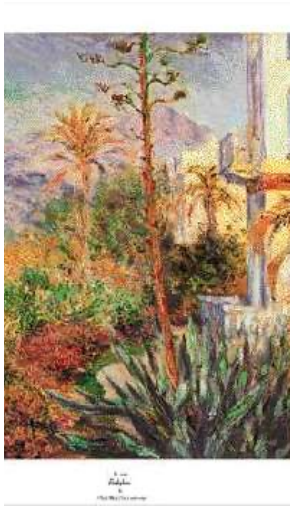
Psychotherapy: Useful, regardless of the type of headache

- Physical - behavioural component
- Cognitive therapy
- Behavioural therapy
- Cognitive Behavioural Therapy



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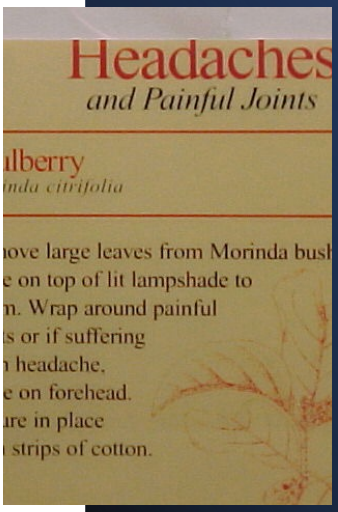
Alternate or complementary medicine

- **Acupuncture**
- **Acupressure**
- **Aroma therapy**
- **Reflexology**
- **Chiropractice**
- **Osteopathy**



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When to MRI?

1. Alteration of consciousness
2. Absence of family history of migraine
3. Abnormal neurological findings on examination
4. Most severe in awakening, awaken from the sleep
5. Gait abnormalities
6. Chronic progressive pattern
7. Progressive vomiting
8. Seizures
9. Headache exacerbate with cough
10. Headache in children less than 6 yrs

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