Headache

General principles

- **There are lots of pain sensitive structures in the head and neck**
- **The key to proper management is to make an accurate diagnosis**
- **Recognize the features of “dangerous” headaches, and know how to rule out**

Pain-sensitive structures in the head and neck

Extra-cranial

Scalp muscles
Skull
Carotid/vertebral arteries
Paranasal sinuses
Eyes, Ears
Mouth, teeth, and pharynx
Cervical spine
Cervical muscles

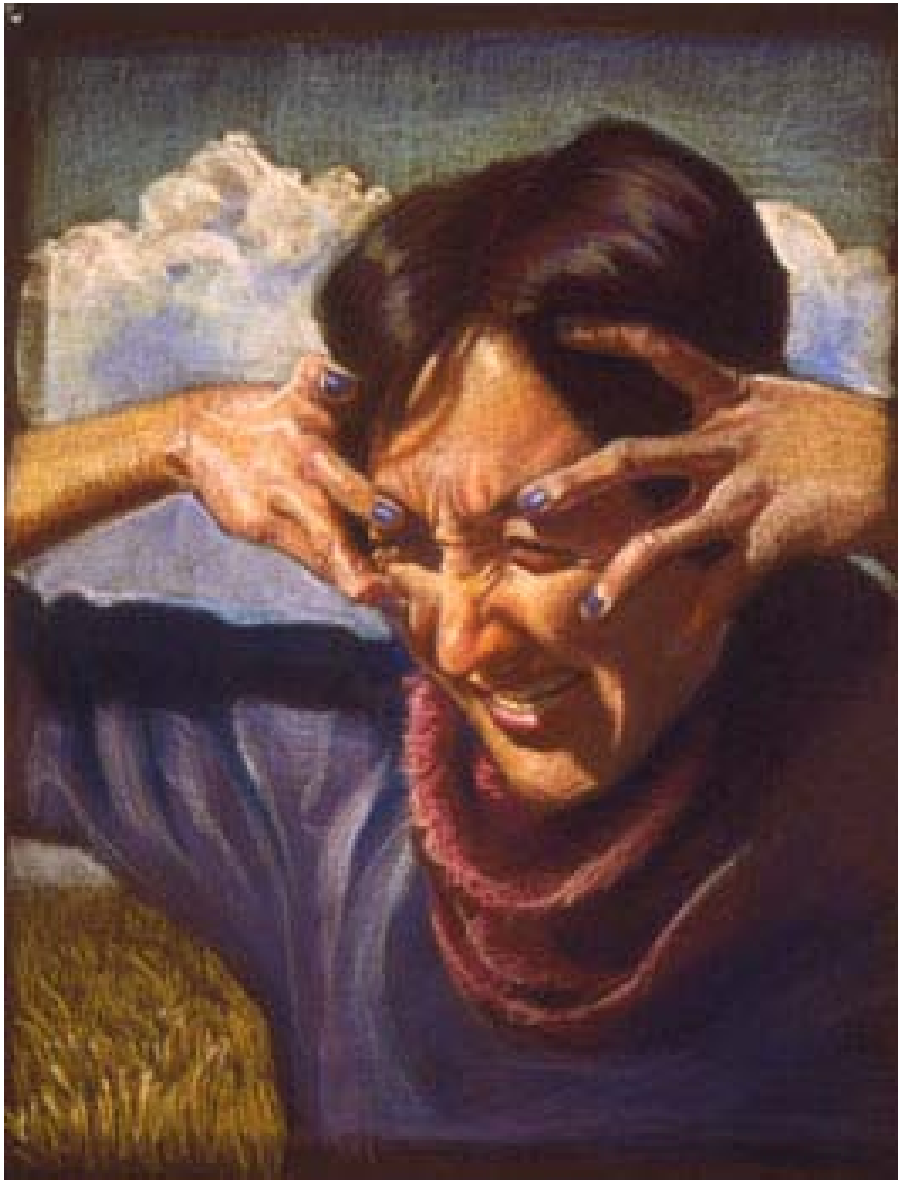
Intra-cranial

Cranial nerves
Meninges
Dural sinuses
Proximal intracr. arteries
Thalamic nuclei
Brainstem pain-modulating centers
Meningeal arteries

Causes of headaches

1. Traction or dilatation of intra- or extra-cranial arteries
2. Traction of large extracranial veins
3. Compression, traction or inflammation of cranial and spinal nerves
4. Spasm and trauma of cranial and cervical muscles
5. Meningeal irritation
6. Raised intracranial pressure
7. Disturbance of intracerebral serotoninergic projections

Classification



- **Primary headaches**
- **Secondary (symptomatic?) headaches**

Primary headaches

- **Migraine without aura**
- **Migraine with aura**
- **Tension headache**
- **Cluster headache**
- **Combination headache**

Secondary headaches

- **CNS infection**
- **Vascular disease**
- **Intracranial pressure disorders**
- **Metabolic and toxins**
- **Malignant hypertension**
- **Head trauma**
- **Dental & ophtalmological disorders**
- **……**

Migraine

An episodic headache, often with sensitivity to light, sound or movement, and with nausea or vomiting accompanying the headache.

- **But:** None of these features is an **obligatory** diagnostic feature

IHS: Minimum for migraine without aura
(>90% specificity)

>5 recurrent episodes of headache attacks lasting 4-72 hs

- **With at least 2 of:**
  - Unilateral
  - Pulsating
  - Moderate to severe
  - Worsen by physical activity
- **And at least 1 of:**
  - Nausea or vomiting
  - Increased light sensitivity
  - Increased noise sensitivity

IHS:Minimum for migraine with aura

>2 recurrent episodes of headache attacks lasting 4-72hs

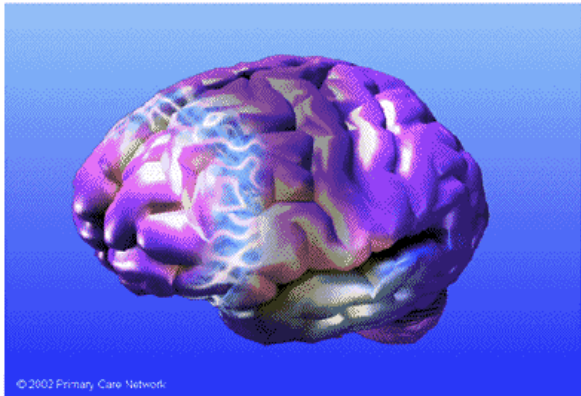
A. Any 3 (or more) of:

1. One or more reversible aura symptoms
2. At least one aura symptom develops over >4 min., or two or more symptoms in succession
3. No single symptom of aura lasts >60 min.
4. Headache follows aura with free interval <60 min, or begins with aura.

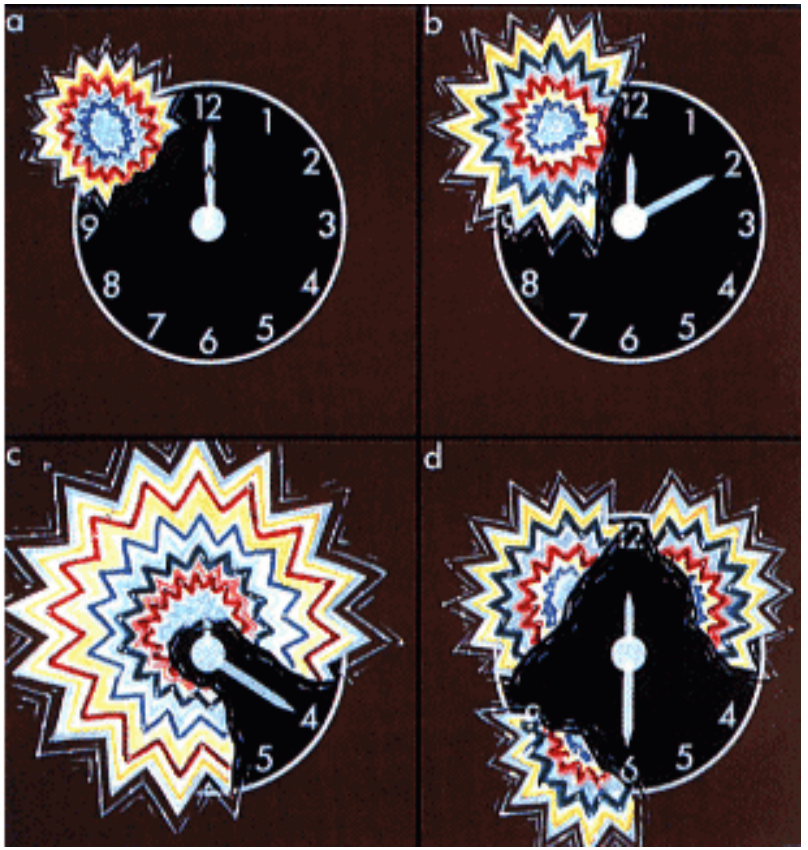
B. Same as for migraine without aura

Migrainous aura

- Spreading electrochemical depression across cortex
- Typically occurs 20-30 min before onset of head pain
- >70-80% migraineurs never experience aura
- Aura can occur w/o headache



Migrainous Aura



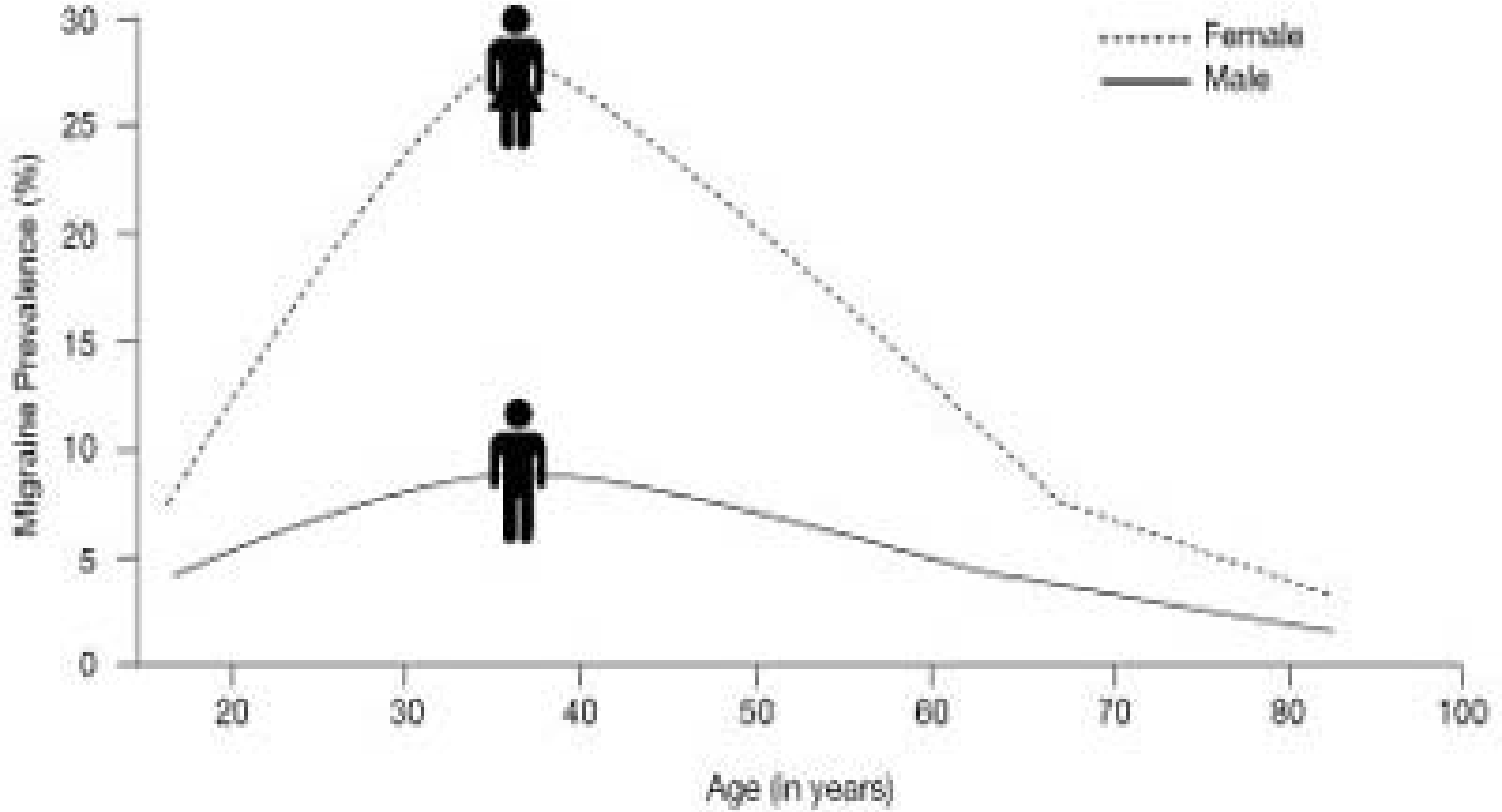
Migraine

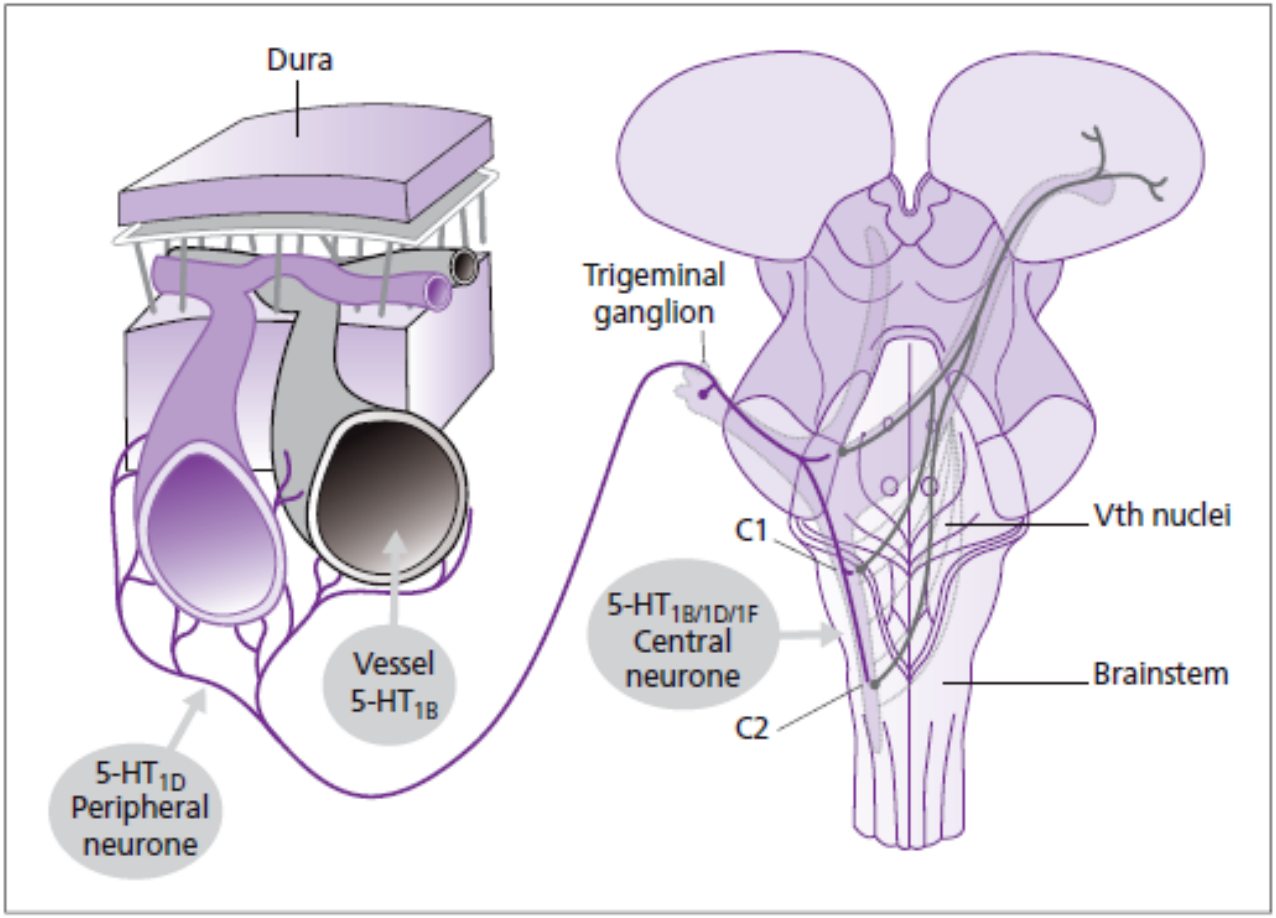
- Aura: 20-30% of patients only
- Prodromes: mood change, excess energy (euphoria) to depression (lethargy), craving for food, etc.
- Gradual onset – not thunderclap!
- Examination generally normal

Typical migraine patient

- Onset often as child / teenager / young adult (but can start at any age!)
- 2-3 x more common in women than men
- Typical patient: Young woman (15% of all young women)

Migraine: Age distribution





Pathophysiology of migraine

- Migraine involves dysfunction of brainstem pathways that normally modulate sensory input
- The key pathways for the pain are the trigemino-vascular input from the meningeal vessels
- It passes through the trigeminal ganglion and synapses on second order neurons in the trigemino-cervical complex

What happens during a migraine?

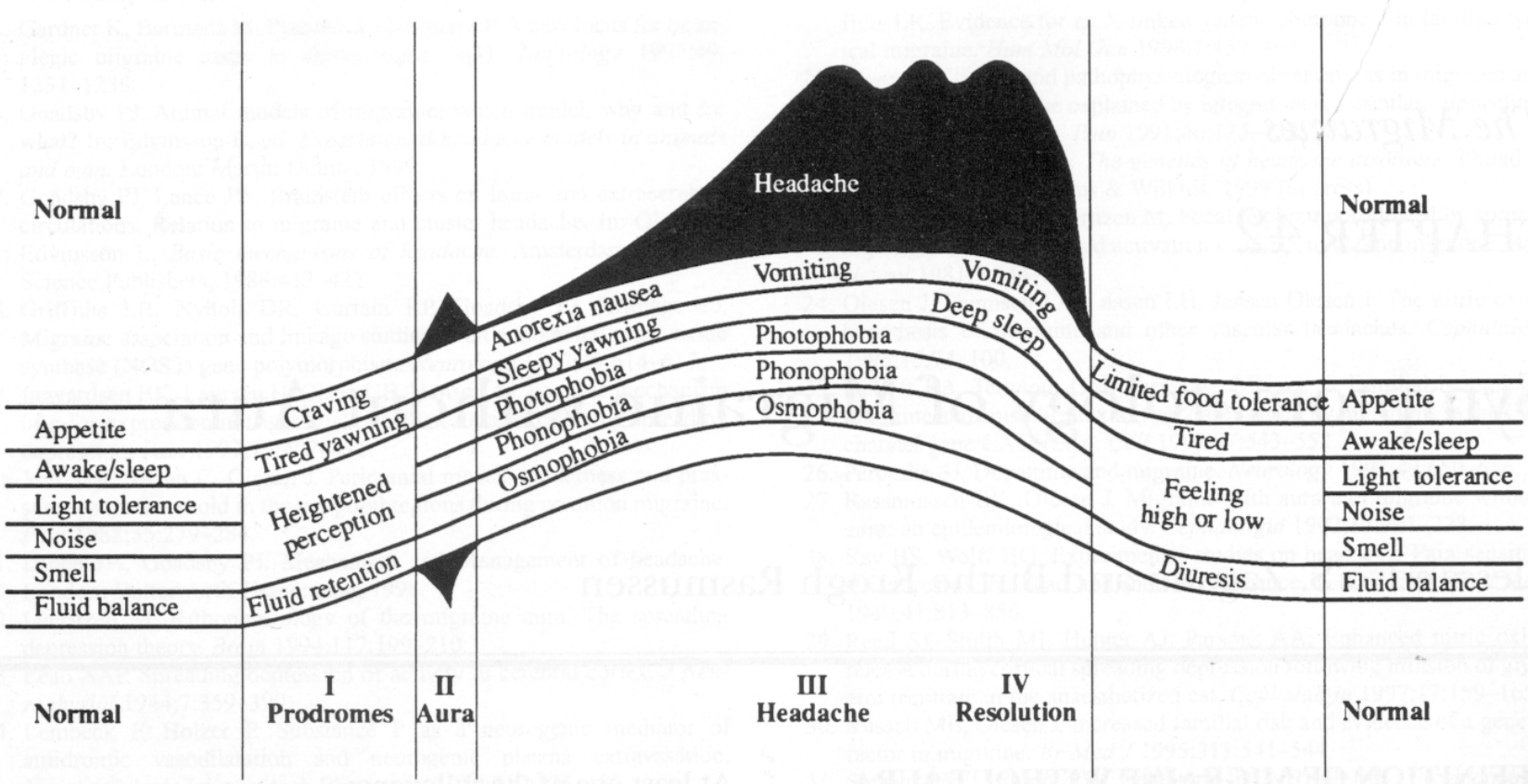
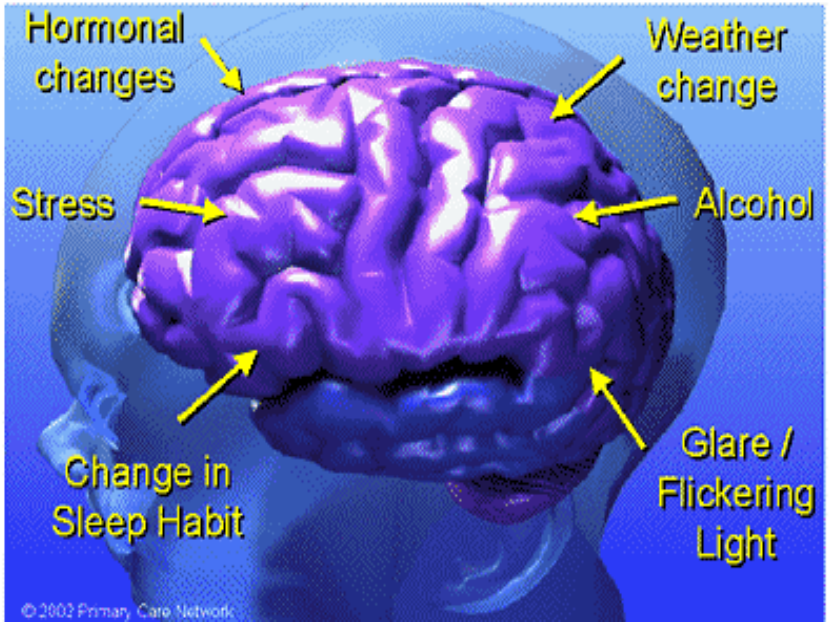


FIG. 1. Symptoms and signs during phases of a migraine attack. Reproduced from Blau (6).

Triggers



- Foods: spices, wine, chocolate
- Food additives: monosodium glutamate
- Sleep: both too much and too little
- Stress
- Female hormones: fluctuating or falling oestrogen

Episodic Tension-Type Headache (TTH):

At least 10 attacks of:

A. Duration 30 min – 7 days

B. ≥2 of the following **characteristics**:

1. Pressing/ tightening (non-pulsating)
2. Mild/Moderate intensity
3. Bilateral
4. Not aggravated by routine activity

C. Both of:

1. absence of nausea and vomiting (anorexia may occur)
2. absence of photophobia or phonophobia

> 15 days/ month = Chronic Tension Type Headache (CTTH)

Tension type headache

- Muscle contraction precipitated by stress/anxiety
- 20-40 years
- Female/male ratio 3:1
- Pressure sensation or pain

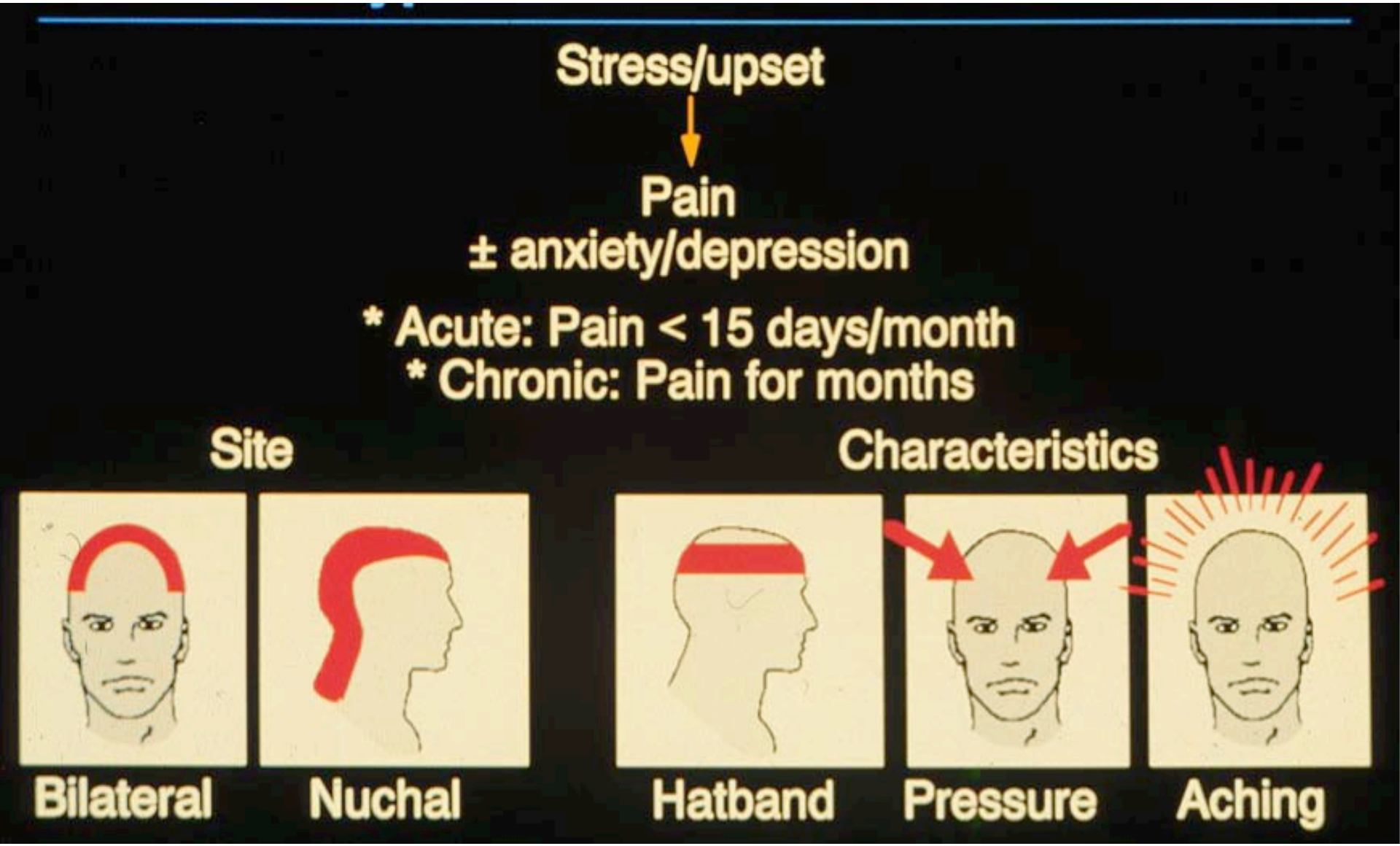
  “As head is going to explode”

  “On fire or stabbing from knives or needles”

  Daily increasing through the day

  Forehead to occiput or neck – or vice versa

TTH: Different descriptions of pain



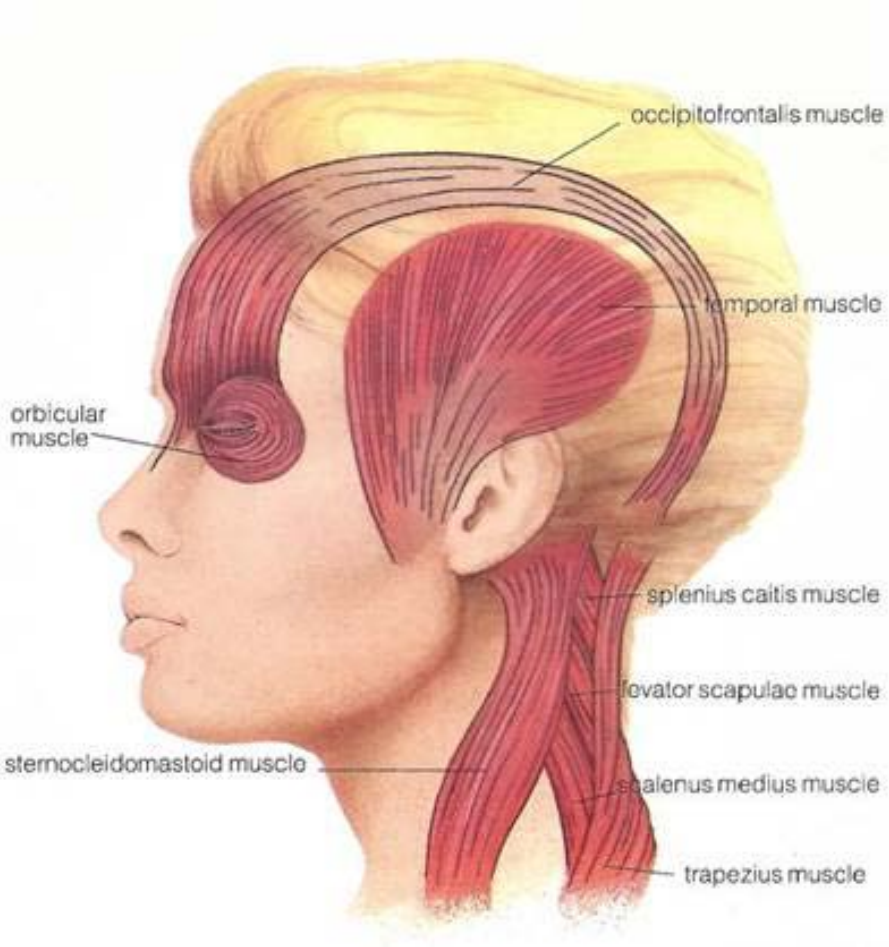
Typical patient : Any!

Chronic Tension-Type Headache

- **Develops from episodic tension-type headaches**
- **The most common form of CDH**
- **Familial tendency**
- **Medication rebound headache may be a factor in the transformation of ETTH to CTTH**

Chronic Tension Type Headache

- Affect women more than men
- Most common in middle age
- Stress is often a trigger

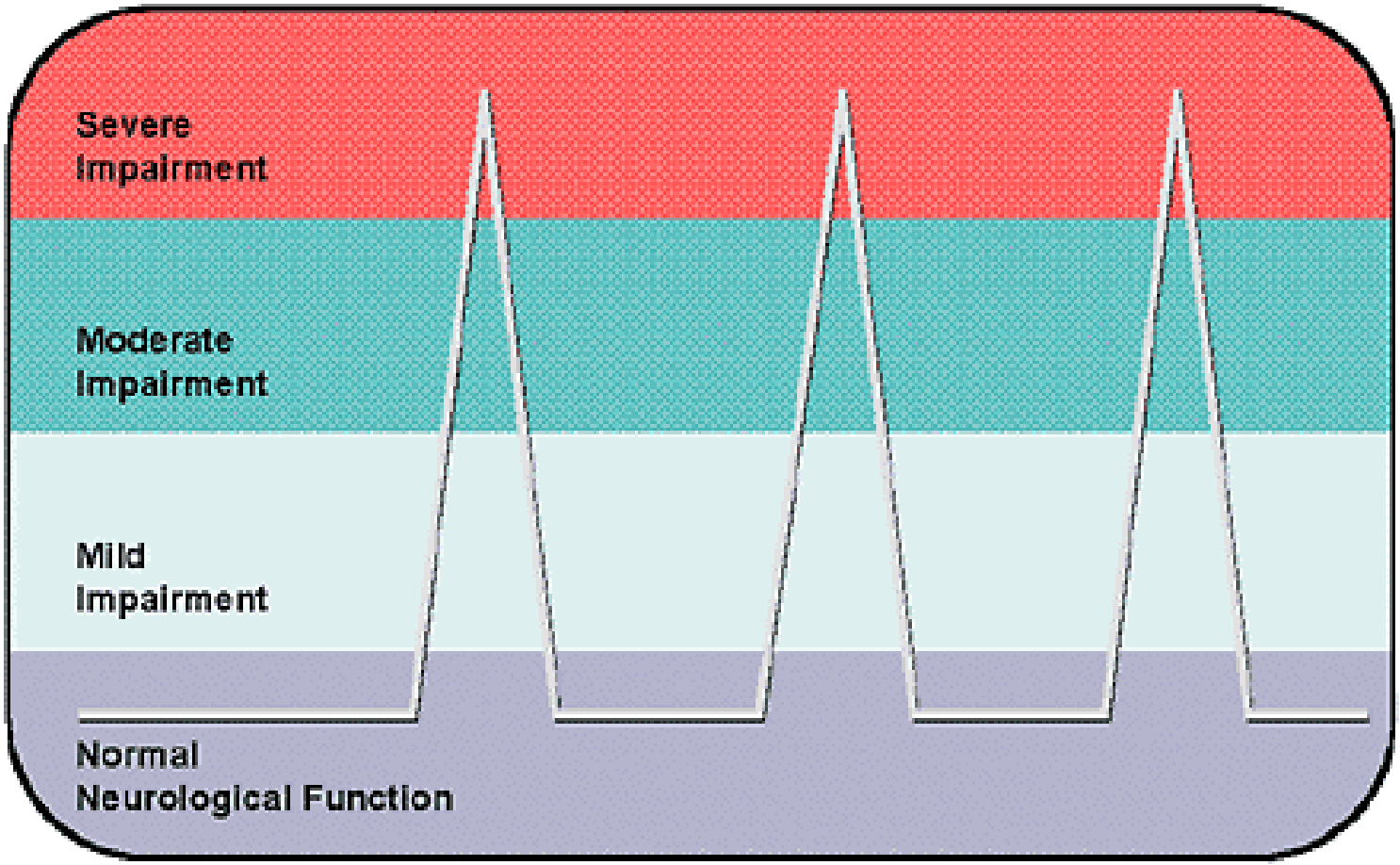


Combination Headache

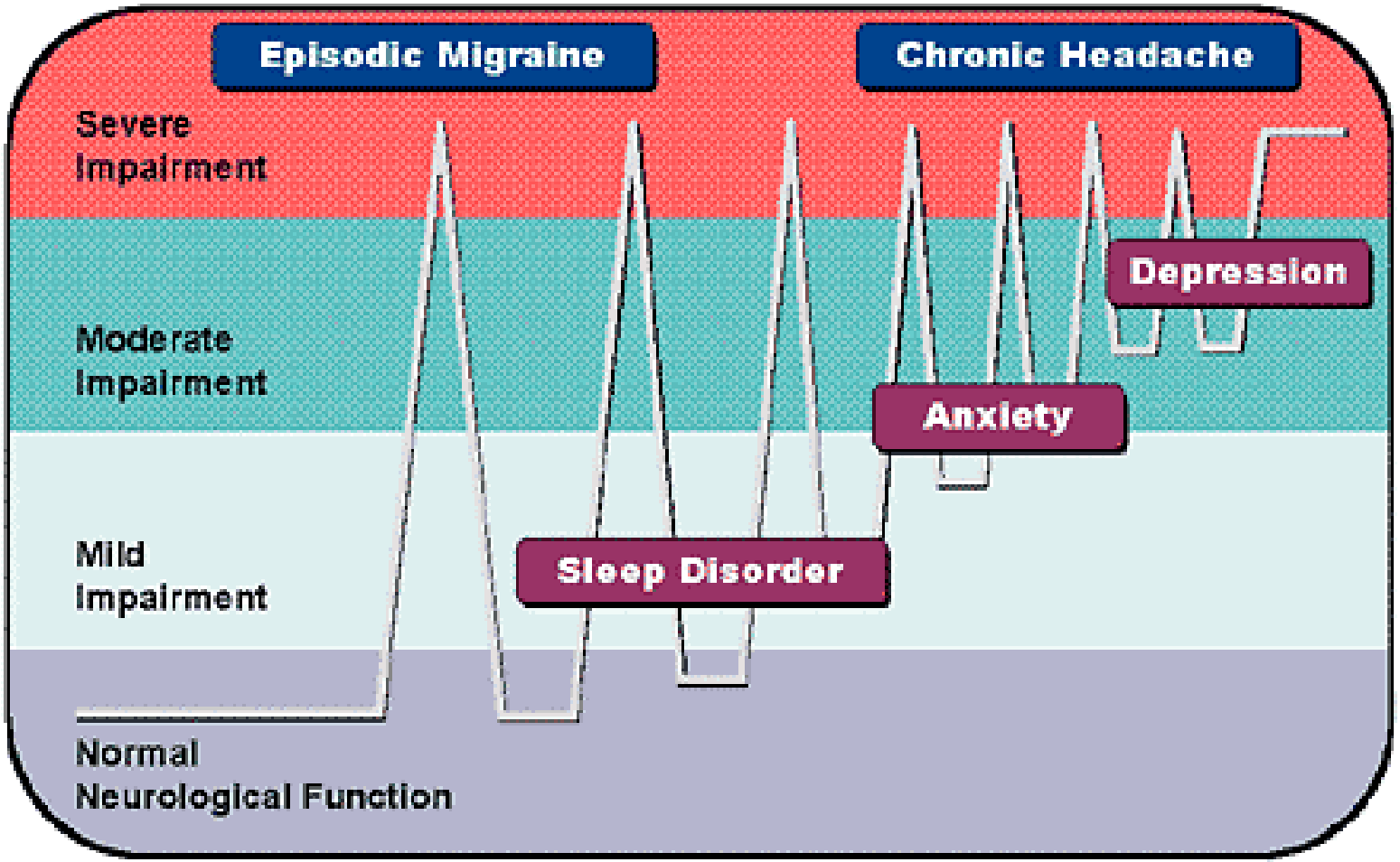
Tension-type headache + Migraine

The TTH may precipitate a migraine

Episodic migraine



Transformed migraine (CDM)



Chronic Daily Headache

- **Definiton**: Head pain for at least 4 hours for more than 15 days/month.
- **Affects** 4-5% of the population
- Often **develops** from an episodic headache disorder – either migraine or episodic TTH
- **Includes** chronic tension-type headache (CTTH) and chronic daily migraine (CDM)

Cluster Headache

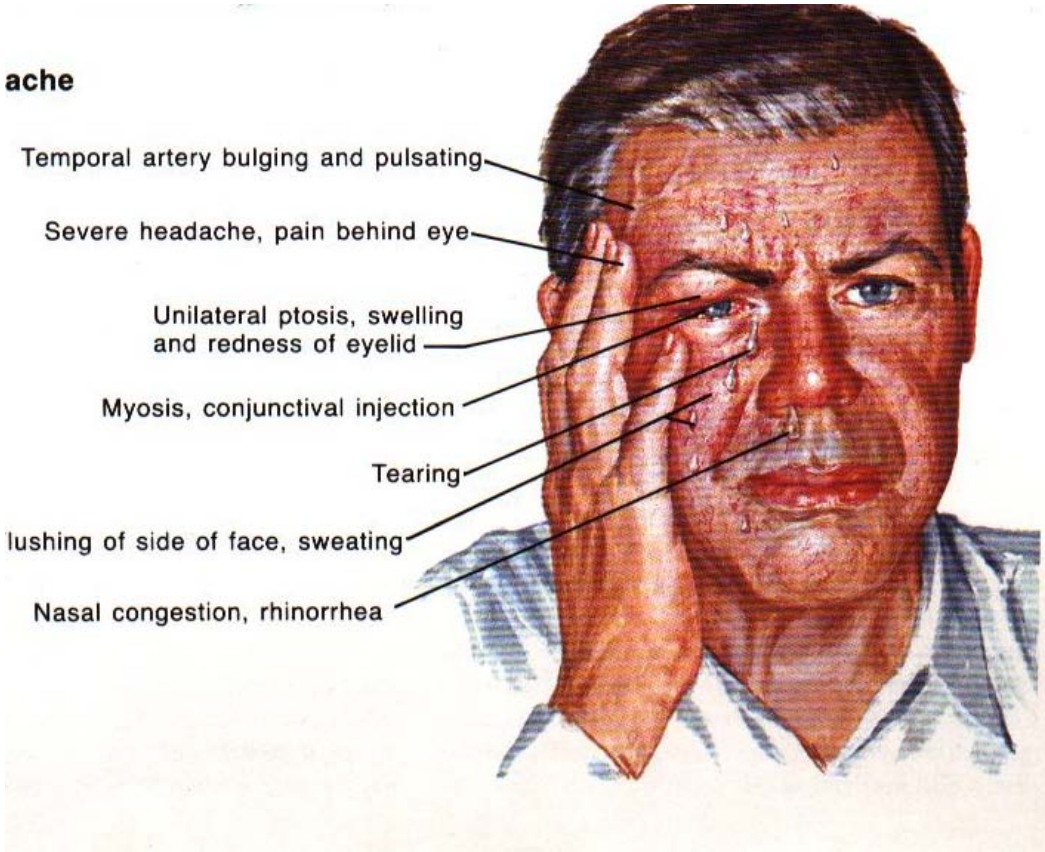
Watery eye, drooping eyelid, runny nose

- **Age of onset 25-50 years, M>F**

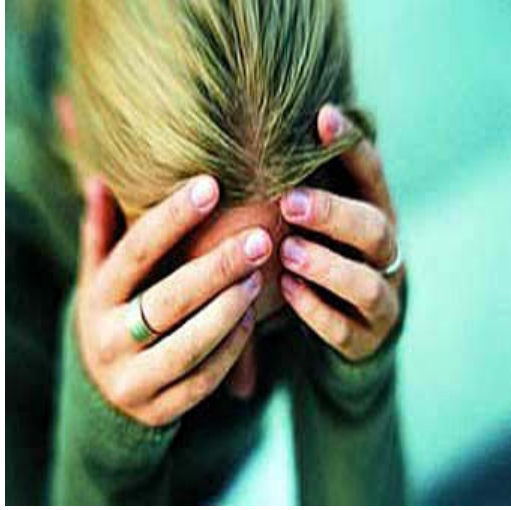
- **Features:**
  - Attacks clustered in time (>5)
  - Severe unilateral, orbital or temporal pain
  - Lasting 15min – 3h
  - Ipsilateral conjunctival injection, lacrimation, nasal congestion, rhinorrhea, forehead/facial swelling, miosis, ptosis

Cluster: Autonomic features

- Eyelid swelling
- Ptosis
- Miosis
- Conjunctival injection
- Lacrimation
- Nasal congestion
- Rhinorrhea
- Facial sweating



Diagnosis of Headache: History taking



- The most important investigation in the evaluation of headaches is **History**
- First question to answer ourselves is whether it is a **Primary or Secondary** headache syndrome
- Any important "**Red flags**" in history or examination to consider investigation for a secondary headache

History:

- How old were you when the headaches started?
- How often do they come?
- Do they come in relationship to anything else?
- At what time do they come on?
- Are there other symptoms?
- How do they start?
- Where is the pain?
- How long does it last?
- How bad is it?
- What helps?

Physical Examination

- **Blood pressure**
- **Fundoscopy**
- **Temporal artery inspection and palpation**
- **Meningismus**
- **Neurologic exam: motor, sensory, coordination and gait**

Therapy of Primary headaches

Principles of Therapy:

- Stratified approach: Treat according to severity
- Determine level of intensity and frequency of headache to decide on appropriate acute treatment
- Determine whether to use a combination of pharmacologic and non-pharmocologic therapies
- Determine whether prophylactic therapy is indicated

Treatment of the attack

- **Simple analgesics:**

  Paracetamol 1000mgs **or**

  Aspirin 600-900mgs **or**

  Ibuprofen 400-800mgs **or**

  Diclofenac 100mgs suppository

  +/- antinauseants

- **Triptans:** sumatriptan, rizatriptan, zolmitriptan, eletriptan..

  Triptans should be taken after headache starts – not during aura!

Migraine: Therapy of acute attacks

Principles:

- Set limits on treatments, i.e. no more than 2 days/week
- If oral agents not tolerated, use nasal sprays, suppositories or injectables
- For nausea/vomiting, use metoclopramide 10mg

Migraine Treatment: The choice

Drug	Level of Evidence
Triptans	A
NSAIDs	A
Avamigran (Fiorinal, Caffergot..)	A
Paracetamol (acetampinophen)	B
Dihydroergotamine	B
Steroids	C

Triptans: Imigran, Zomig, Maxalt....

FOR

- Can be very effective for migraine and cluster (not for tension)
- Tablets, wafers, nasal spray, injection

AGAINST

- Expensive
- Overuse makes headaches more frequent
- Constrict blood vessels

Emergency treatment for severe migraine:

- Subcutaneous sumatriptan 6mgs (if no triptan already taken) **or**
- Diclofenac (100mg) suppository or 75mgs IM
- Metoclopramide IM

- **Opiates should be avoided!**

Consider prevention when:

- Headaches interferes with patients daily routine
- Frequency >2/week
- Acute medications ineffective or contraindicated
- Presence of uncommon migraine conditions
  - Hemiplegic migraine
  - Basilar migraine
  - Migraine with prolonged aura

Preventive drugs

- Mixed bag of drugs used for other conditions found to be effective in headache – usually by chance
- Drugs for high blood pressure, depression, epilepsy...
- All work in somebody; none works in everybody
- Generally reduce frequency – but do not change attacks
- Key to success: trial and error
- Need to start at low dose and increase until effective – or not tolerated

Migraine prophylaxis

- **Treat for at least 3 months!**

- **Beta-blockers**

  Propranolol 20mg bd (increase gradually)

- **Tricyclic AD**

  Amitriptyline 10 - 50mgs nocte

  (especially useful if also suffering from TTH)

Drugs for migraine prevention

Drug	Evidence
Propranolol	A
Amitriptyline	A
Valproate	A
Aspirin	B
Gabapentin	B
Fluoxetine (Prozac)	B
Clonidine (ά-agonist)	B
Verapamil	B

Treatment of tension-type headaches

- **For moderate attacks NSAIDs useful**
- **For severe attacks (sometimes) triptan drugs effective**
- **Non-pharmacologic therapy**

Treatment of episodic TTH

- **Simple analgesics**: Ibuprofen is more effective than paracetamol
- **Combine** analgesics with a sedating antihistamine medication – eg. diphenhydramine
- **Limit** treatment to 2 days a week to prevent rebound headaches

Treatment of CTTH

- **Treating each headache increases the frequency and severity of the headaches**
- **Reserve medications for worse than usual headache**
- **Expert opinion: Treat 2 headaches a week**

Prevention of CTTH

- **Tricyclic antidepressants**
- **Stress management**
- **SSRIs**
- **Anticonvulsants: gabapentin, topiramate**
- **Tizanidine (muscle relaxant)**
- **Acupuncture?**

Main Menu

Treatment Recommendations

Treatment options with Grade-A evidence:

- Relaxation therapy
- Thermal biofeedback combined with relaxation therapy
- EMG biofeedback
- Cognitive-behavioral therapy

Grade-A evidence is defined as as having multiple, well-designed randomized clinical trials, directly relevant to the recommendation, yielding a consistent pattern of findings.

Adapted from US Headache Consortium Headache Guidelines. www.aan.neurology.org. 2000

Non-drug therapy

Herbal

- Feverfew – no
- Butterbur (repuh) – possibly

Botox: Too expensive

Physiotherapy: With caution

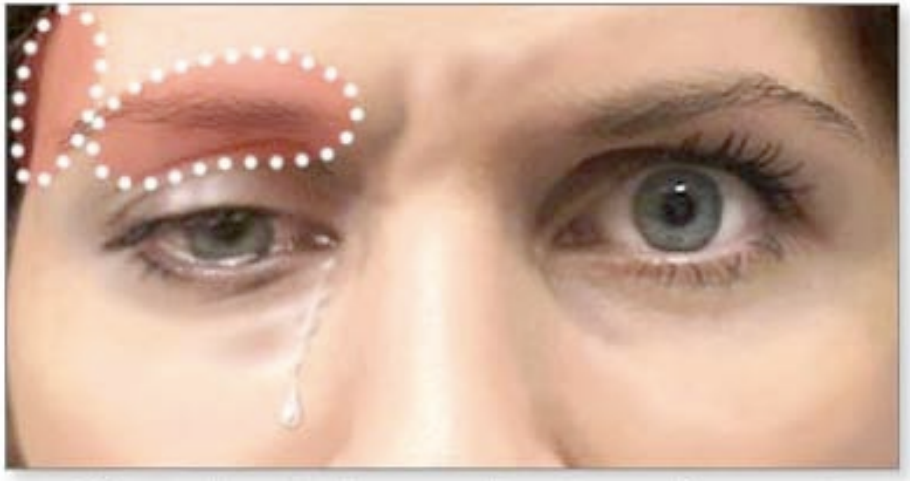
Acupuncture: ?

Magnesium 400mg: Possibly

Electrical occipital nerve stimulation: Possibly

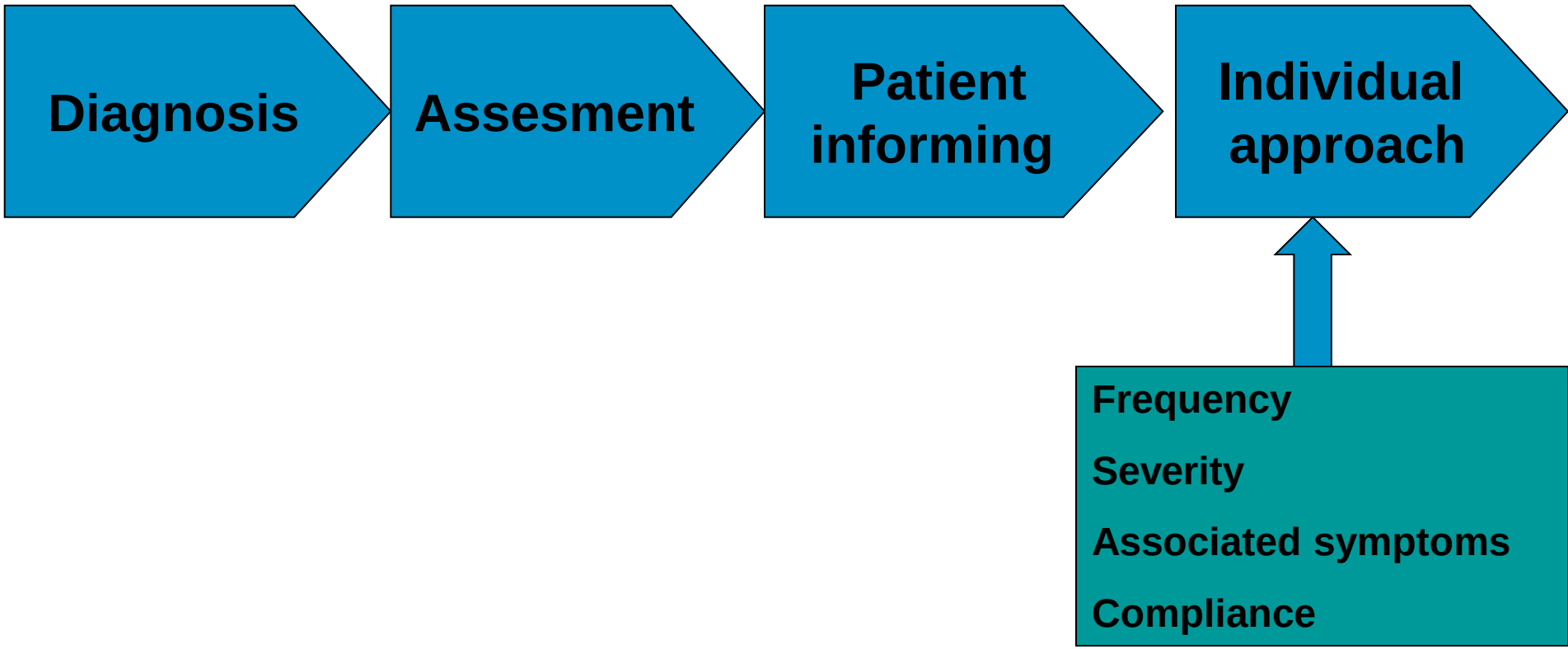
Closure of foramen ovale apertum: No

Cluster headache:

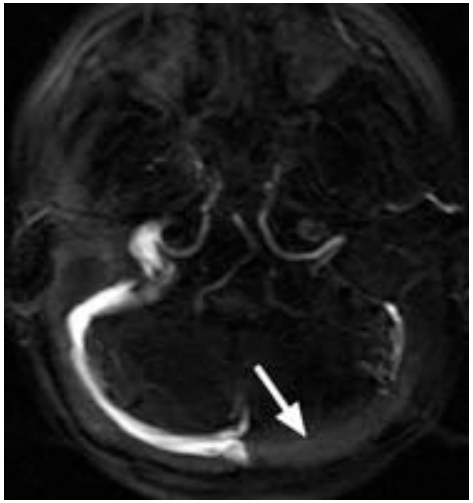


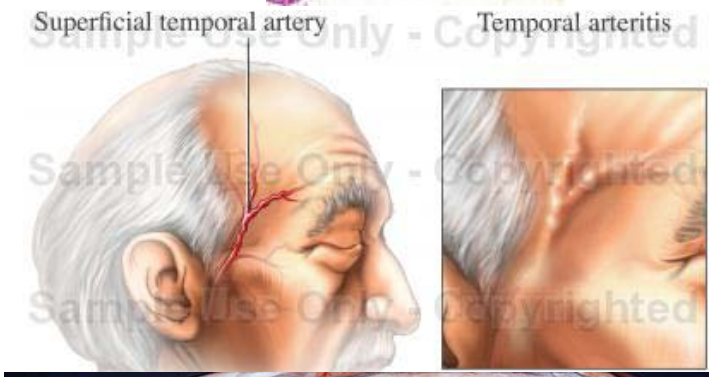
- **Rare but debilitating**
- **Carry high risk of suicide**
- **Agent must have rapid onset of action**
- **Acute treatment:**
  - Oxygen 100% (evidence)
  - Injectable sumatriptan (6mg.)

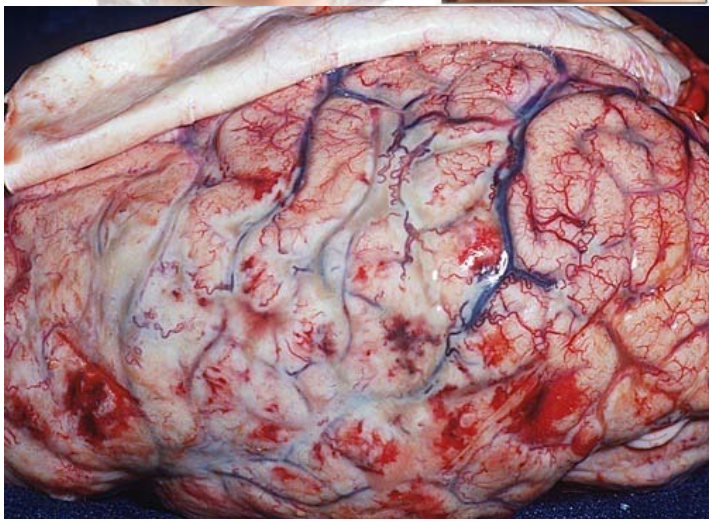
Approach to patient with primary headache



Secondary headaches: Important headaches that you can't miss







“Red Flags”

- New headache – especially in over 50 years
- Abrupt onset
- Unusually severe
- Change in usual headache pattern
- Associated with focal neurologic findings
- Change in LOC, personality, lethargy
- Fever, neck stiffness
- Systemic signs or/and symptoms

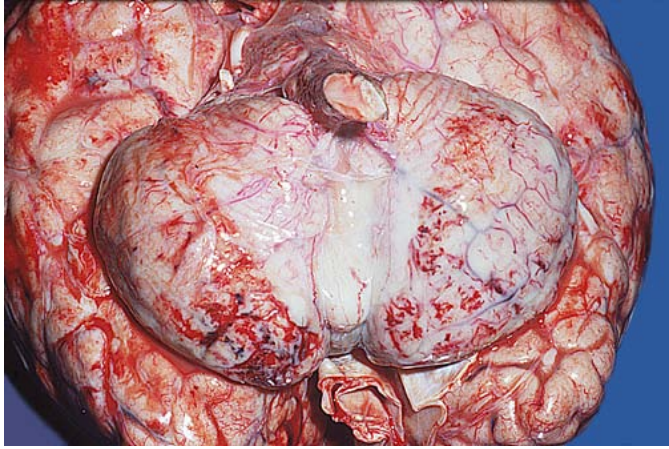
“SNOOP – T”: Red flags for secondary headaches

- **S**ystemic symptoms: Fever, weight loss, etc.
- **N**eurological symptoms +/- abnormal signs: Confusion, impair alertness or consciousness, focal signs
- **O**nset: Sudden, abrupt or worsening and progressive
- **O**lder: New onset and progressive headache – especially in age > 50 years
- **P**revious headache history: First headache or different (significant change in attack frequency, severity or clinical features)
- **T**riggered headache: By Valsalva, exertion or sexual intercourse

Dangeorous headaches

- **Bacterial meningitis**
- **Subarachnoid haemorrhage**
- **Giant cell artheritis**
- **Cerebral venous sinus thrombosis**
- **Carotid artery dissection**

Bacterial meningitis

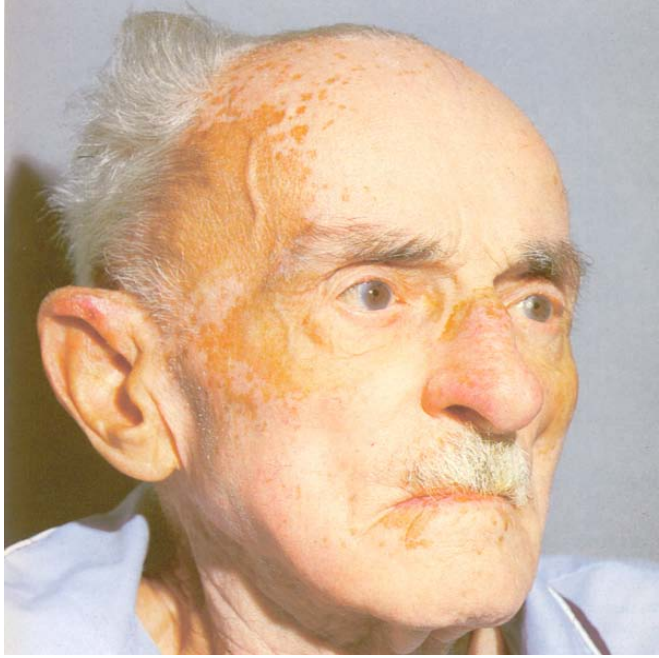


- High level of suspicious if fever and altered consciousness!!!
- Acute bacterial meningitis is an important fatal medical emergency – early recognition saves lives
- Confirm diagnosis&pathogen with CSF analysis via lumbar puncture
- Prompt initiation of antibiotics

Subarachnoid haemorrhage

- **Commonest potentially life threatening acute severe headache**
- 1/3 present with acute onset of severe headache **as only symptom**
- **Headache characteristics:** Acute or abrupt, “Thunderclap”
- **“Worse ever”**: more likelihood
- **Transient** lost of consciousness or epileptic **seizure**

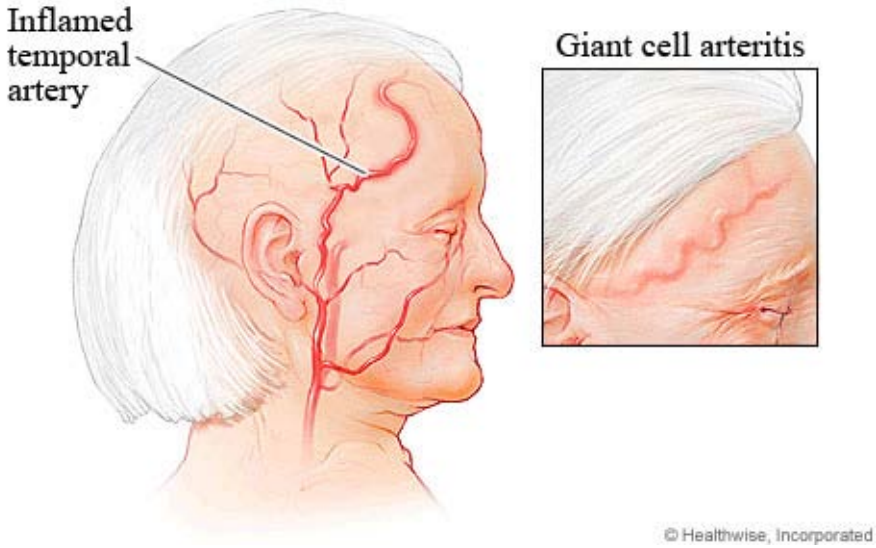
Giant cell artheritis



- Affects large/medium size arteries
- Microscopically infiltration of lymphocytes, macrophages and multinucleates giant cells
- Vessel are tender, red, firm and pulsless, scalp sensitivity

- Risk of blindness if not treated!

GCA: Presentation



- Rare before 55
- Female > male (2:1)
- Insidious onset
- Often associated with jaw claudication on chewing
- Headache localised to the superficial occipital or temporal arteries, throbbing and worse at night
- Raised CRP and ESR
- Diagnostic biopsy

- Prednisolone 60 mg

Cerebral venous sinus thrombosis

- **Acute/subacute progressive “headache plus” syndrome**

  Papilloedema “ idiopathic intracranial hypertension” mimic

  Symptoms of raised ICP

  VI nerve palsy

  Focal signs

  Seizures

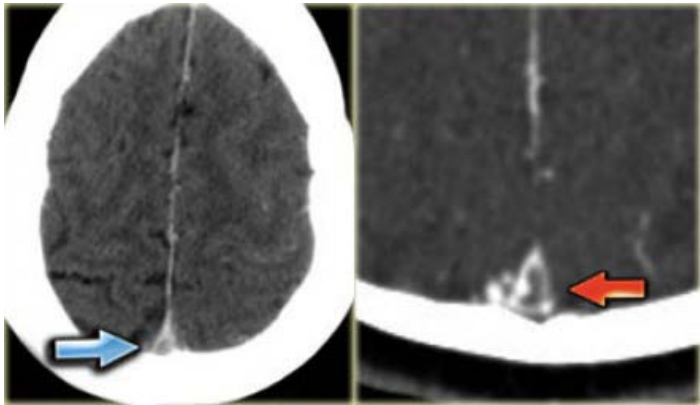
  Enchephalopathy

- **SAH like presentation**

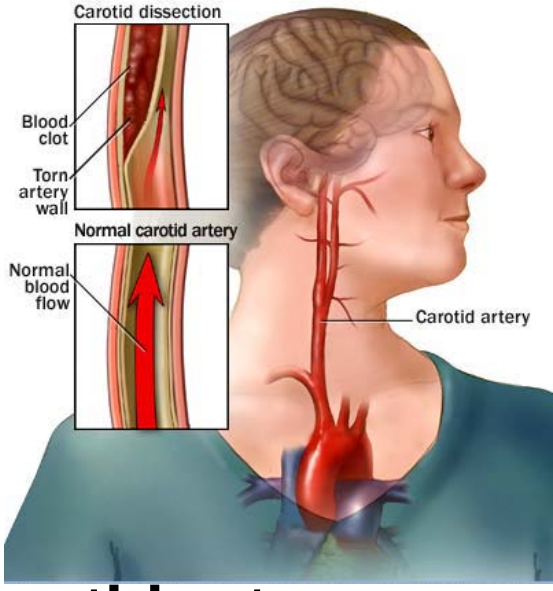
  CT: “empty delta” sign

  CSF negative

  Consider specially if raised CSF pressure



Carotid dissection



- A hemorrhage into the wall of the carotid artery
- Separating the intima from the media
- Leading to aneurysm formation
- Suspect in
  - Blunt trauma
  - Rotational forces
  - Manipulation
  - Spontaneous

Other common headaches

- **Sinusitis**
- **Glaucoma**
- **Hyponatraemia**
- **Toxins:** Alcohol excess and withdrawal
- **Drugs:** Calcium channel blockers, nitrates
- **Coital** migraine/cephalgia
  - 50% previous migraine
  - Exclude SAH
  - 40-80 mg Propanolol or indometacine before intercourse

Conclusions

- **Remember**: History is the most important clue!
- **Classification** useful in clinical practice:

  Primary headache (migraine – cluster – tension)

  Head trauma

  CNS infection

  Vascular disease

  Intracranial pressure disorders

- Remember **“SNOOP – T”**
- **Don’t miss: Brain tumours, Giant-cell artheritis, Carotid dissection, Meningitis and SAH!**