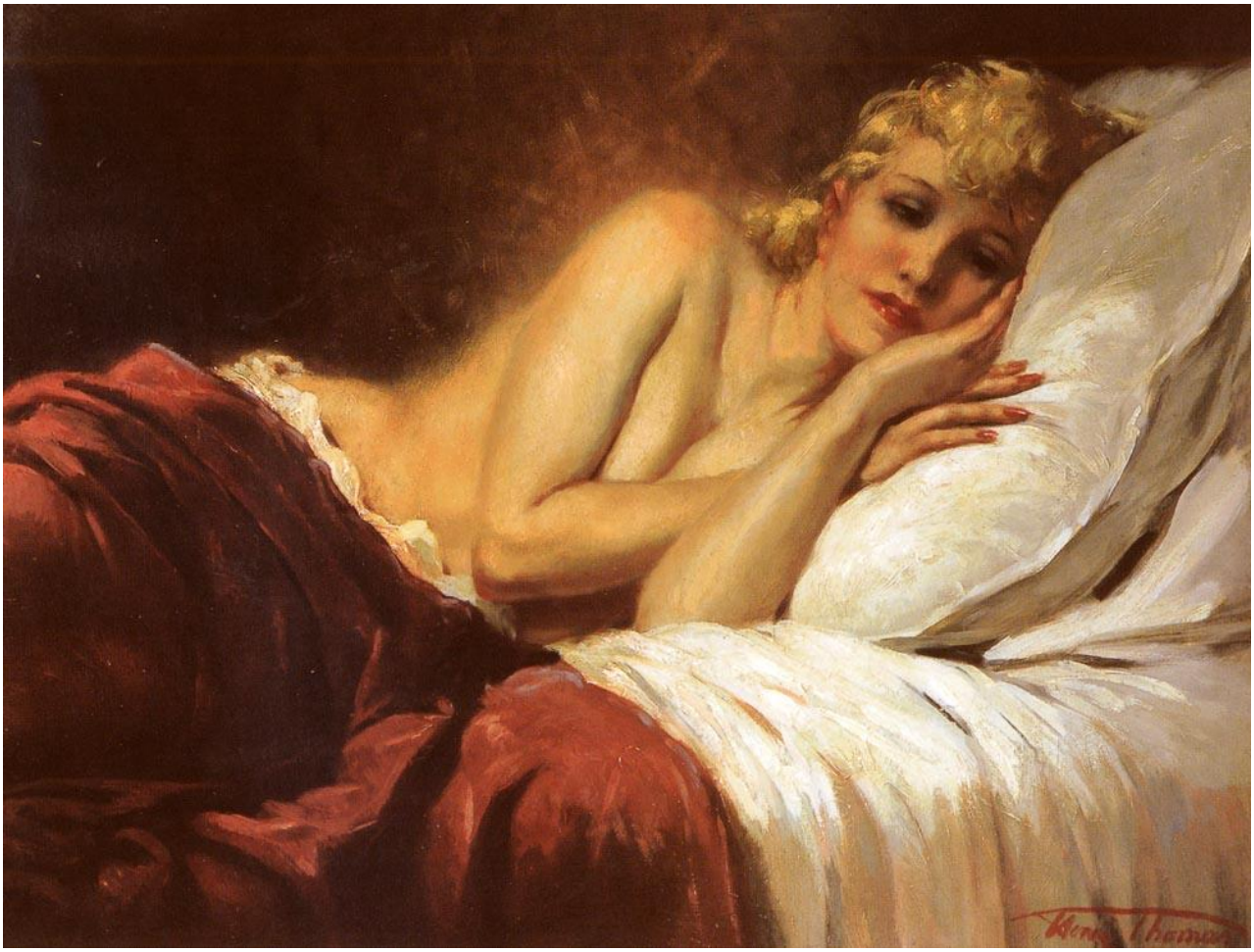
THE NORTHERN HOSPITAL

HEADACHE



"Where do you go to my lovely?" "Reclining Girl", Henri Joseph Thomas, (1897-1972) oil on canvas.

Left: Sophia Loren, Venice 1954.

You talk like Marlene Dietrich
And you dance like Zizi Jeanmaire
Your clothes are all made by Balmain
And there's diamonds and pearls in your hair, yes there are.

You live in a fancy apartment
Off the Boulevard of St. Michel
Where you keep your Rolling Stones records
And a friend of Sacha Distel, yes you do.

You go to the embassy parties
Where you talk in Russian and Greek
And the young men who move in your circles
They hang on every word you speak, yes they do.

But where do you go to my lovely
When you're alone in your bed
Tell me the thoughts that surround you
I want to look inside your head, yes I do.

I've seen all your qualifications
You got from the Sorbonne
And the painting you stole from Picasso
Your loveliness goes on and on, yes it does.

When you go on your summer vacation
You go to Juan-les-Pines
With your carefully designed topless swimsuit
You get an even suntan, on your back and on your legs.

And when the snow falls you're found in St. Moritz
With the others of the jet-set
And you sip your Napoleon Brandy
But you never get your lips wet, no you don't.

But where do you go to my lovely
When you're alone in your bed
would you Tell me the thoughts that surround you
I want to look inside your head, yes I do.

You're in between 20 and 30
A very desirable age
Your body is firm and inviting
But you live on a glittering stage, yes you do, yes you do.

Your name is heard in high places
You know the Aga Khan
He sent you a racehorse for Christmas
And you keep it just for fun, for a laugh ha-ha-ha

They say that when you get married
It'll be to a millionaire
But they don't realize where you came from
And I wonder if they really care, or give a damn

But where do you go to my lovely
When you're alone in your bed
Tell me the thoughts that surround you
I want to look inside your head, yes I do.

I remember the back streets of Naples
Two children begging in rags
Both touched with a burning ambition
To shake off their lowly brown tags, they try

So look into my face Marie-Claire
And remember just who you are
Then go and forget me forever
But I know you still bear
the scar, deep inside, yes you do

I know where you go to my lovely
When you're alone in your bed
I know the thoughts that surround you
'Cause I can look inside your head.

"Where Do You Go To My Lovely?" Peter Sarstedt, 1969.

To truly understand someone you need to "get inside their head". Did Peter Sarstedt manage to do this with Sophia Loren with his "one hit wonder" in 1969?

The scars of one's past life may remain forever hidden deep within one's "psyche". Headaches may be the result, but the cause will never be apparent to those who cannot "get inside the head" of the sufferer. Fortunately however when it comes to serious life-threatening structural causes for headache, modern medicine allows us to do just this - by means of the CT or MRI scanner.

HEADACHE

Introduction

Headache is a very common presenting problem to the Emergency Department.

The main issues will include:

- Ruling out a serious/life threatening condition.
- Control of the patient's symptoms.
- Performing the appropriate investigations.
- Determining the optimal disposition.
- Treatment of the cause, where known.

Not uncommonly the exact diagnosis will not be discernable in the ED, and the priorities will necessarily be those of control of symptoms, the ruling out of an immediately life-threatening condition and determination of the most appropriate disposition.

See also separate documents on:

- **Tension headache, (in Neurology folder)**
- **Migraine, (in Neurology folder)**
- **Cluster headache, (in Neurology folder)**
- **Post Lumbar Puncture Headache, (in Neurology folder)**

Pathophysiology

The causes of headache are legion and range from the benign to the immediately life-threatening.

Causes:

In general terms, the main groups of causes include:

1. **Muscular:**
    - Tension headache.
2. **Vascular:**
    - Migraine
    - Cluster headache.
    - Temporal arteritis
    - Other vasodilatory causes of headache:
        - ♥ Alcohol or nitrate induced.
    - Dural sinus thrombosis
    - Cervical arterial dissection:
    - Unusual and unexplained facial, neck pain or headache can be due to radiated pain from **carotid** or **vertebral arterial dissections.**
    - Reversible cerebral vasoconstriction syndrome (RCVS)
    - Posterior reversible encephalopathy syndrome (PRES)
    - Hypertensive encephalopathy
    - This may include pregnancy related Preeclampsia.
3. **Non-specific or "constitutional" including:**
    - Associated with fever
    - Infections in general
    - Toxins such as CO or chemical fumes.
4. **CNS infections:**
    - Encephalitis, (of any cause, including cerebral malaria)
    - Meningitis, (of any cause).
    - Abscess
5. **Raised intracranial pressure:**

Space occupying lesions:

- Trauma, (extradural, subdural, contusions).
- Hemorrhagic stroke, such as SAH or ICH
- Tumour.
- Abscess

Cerebral edema:

- Trauma, (contusion).
- Toxins/ischemia
- Altitude sickness.

Obstructing lesions:

- Intracranial venous thrombosis.
- Intra-ventricular colloid cysts (with obstruction of the foramen of Monroe)
- Blockage of surgical shunts

6. **Post ictal**
7. **Post lumbar puncture**
8. **Neuralgias:**
   - Trigeminal neuralgia.
9. **Referred headache:**
   - Cervical spine
   - Dental pathology
   - Ocular:
     - ♥ Glaucoma
   - ENT:
     - ♥ Sinusitis/ Otitis media/ mastoiditis/ cholesteatoma
11. **Psychogenic:**
    - This should always remain a **diagnosis of exclusion.**

Clinical Assessment

Red Flags:

Important "**Red Flags**" for headache include:

1. Abnormal examination:
    - Altered conscious state/ neurological signs
    - Abnormal vital signs
        - ♥ In particular a fever.
    - Signs of "meningism"
        - ♥ SAH or meningitis.
    - Petechial rash:
        - ♥ Meningococcal disease.
2. Nature of *associated* symptoms:
    - Vomiting, especially if recurrent/ protracted.
    - Widespread **myalgia** raises suspicion for underlying sepsis.
3. Severity:
    - Although severity can be a very subjective symptom, in general terms the greater the severity of the headache, the more suspicion must be raised for an alternative more serious diagnosis.
4. Onset and time course:

    Time course is usually of gradual or innocuous onset.
    - Very acute onset suggest ICH, and SAH in particular.
    - Headache persisting for many days or weeks, is suggestive of a space occupying lesion.
    - **Recurrent early morning** headache is suggestive of raised intracranial pressure from a space occupying lesion.
5. Infection Risk:
    - Recent travel, (consider **cerebral malaria**).

6. High risk comorbidities:

   - Malignant disease:
     - ♥ The possibility of cerebral metastases must be kept in mind.
   - Coagulation disorders:
     - ♥ Bleeding tendencies
     - ♥ Pro-coagulopathies
   - Cerebral shunts:
     - ♥ Patients with V-P shunts or similar should be viewed with a high index of suspicion for shunt complication, such as blockage and infection
   - Immunosuppression:
     - ♥ Especially **HIV**, (tumour and toxoplasmosis)

7. New headaches in those over 50 years of age - and especially the elderly.

8. **Atypical** "migraine" presentations

9. Pregnancy/ including the period of the puerperium.

10. Medications:

    - Warfarin/ NOACs/ enoxaparin/ heparins (bleeds)
    - Oral contraceptive pill (thrombosis)

11. Family history:

    - In particular SAH in close relatives.

12. Possibility of trauma:

    - In the setting of head trauma, headache must always be considered to be due to intracranial injury in the first instance.

      A history of trauma may not be volunteered, especially when occurring some days previous.

13. Communication / assessment difficulties:

    - As with many situations in medicine, if there are significant communication barriers, this necessarily lowers the threshold for investigation.

As headache is a symptom of a number of potentially life-threatening pathologies, the threshold to perform imaging must necessarily be lowered when an adequate history cannot be obtained.

Examples of possible barriers to adequate assessment include:

- ♥ Language and/ or cultural barriers
- ♥ Intellectual impairment
- ♥ Cognitive impairment
- ♥ Mental illness
- ♥ **Drug / alcohol affected.**

14. Representations:

- The index of suspicion must be raised for a serious underlying pathology

Important points of history:

1. Nature of the pain:

- Features suggestive of SAH:
  - ♥ Very **acute** in onset, (SAH needs to be strongly considered)
  - ♥ Associated with exertional activity (note however that *absence* of this feature does *not* exclude the possibility of SAH).
- Features suggestive of raised intracranial pressure:
  - ♥ Chronic and unrelenting
  - ♥ Worse in the early morning or bending down.
- Severity, (mild, moderate or severe):
  - ♥ Note however that headache severity does not necessarily correlate with the severity of the underlying pathology

    SAH is not uncommonly described as the "worst headache ever", however it may also be of more moderate severity as well.
- Location of headache:

  In general terms this is *unreliable* for diagnosis.

However, unilateral headache can indicate:

- ♥ Migraine / cluster headache.
- ♥ Localized lesions e.g. abscess, glaucoma, TMJ dysfunction.

2. Acuity of onset:

Very acute onset of headache must always raise suspicion for aneurysmal SAH in the first instance.

However a number of other conditions can also present with acute onset headache including the following:

- Reversible cerebral vasoconstriction syndrome
- Perimesencephalic haemorrhage (a cause of non- aneurysmal SAH)
- Intracerebral haemorrhage.
- Toxic sympathomimetic drug reactions with intracerebral haemorrhage.
- Some intracerebral infarctions:
  - ♥ A posterior fossa embolic event
  - ♥ Pituitary apoplexy (infarction or hemorrhage).
- Cervical artery dissections:
  - ♥ Carotid or vertebral dissection more typically give neck pain, but there can also be radiated headache.
- Colloid cyst foramen of Monro obstruction
- Phaeochromocytoma
- Primary arteritis of the CNS (with bleeding).

3. Associated symptoms:

- **Vomiting:**
  - ♥ This is a significant "**red flag**" symptom in patients who present with headache.

    Protracted or unexplained vomiting may indicate raised intracranial pressure.

- Photophobia:
    - ♥ This may be associated with meningitis, however this is a very non-specific and very insensitive symptom.

4. Any history of **trauma**, or *possibility* of trauma in the recent past?

    - Subdural hematomas are not uncommonly missed in the elderly, confused and alcoholics, who may not give any clear history of antecedent trauma.

5. Past history:

    Important points include:

    - A past history of migraine:
        - ♥ If so, is this episode typical? (If not a CT should be considered)
        - ♥ Beware of the *labelling* a patient with "migraine" if:
            - ♥♥ They are elderly.
            - ♥♥ It is their first presentation of migraine.
            - ♥♥ The migraine is not **typical** (or typical for them).
            - ♥♥ The patient is "allergic" to most analgesics, apart from narcotics! (Migraine is sometimes a presenting complaint of drug seekers)
            - ♥♥ Has not responded to adequate migraine treatment.

        Beware of *labeling* patients as having migraine, when the diagnosis is unclear, especially if the headache does not fit the typical pattern of migraine (in particular it is bilateral instead of unilateral or does not fit the patient's *usual* pattern).

        This is a common and recurring reason for misdiagnosis of serious intracranial pathology.

    - Surgical shunts:
        - ♥ If the patient has a V-P, V-A shunt, V-pleural shunt blockage and/or infection must always be suspected.
    - Has there been any recent neurosurgical procedures?
    - Has there been a recent LP performed?

6. Family history:

- Of SAH in close relatives particular

7. Is the patient at increased risk for intracerebral infections?

   - **Falciparum malaria, (recently returned travellers)**
   - **HIV positive, (toxoplasmosis)**

8. Medications:

   In particular:

   - **Warfarin** or a **NOAC** (hence mandating a CT scan).
   - Contraceptive pill (increased risk of dural sinus thrombosis).
   - Use of nitrate antianginal medications.
   - Asasantin

9. Pregnancy related/ including the period of the puerperium:

   Pregnant patients with severe unexplained headache should prompt consideration of:

   - **Pre-eclampsia**
   - **Intracerebral venous sinus thrombosis.**

Important points of examination:

1. Conscious state:

   Is there any evidence of raised intracranial pressure?

   - **Clouded conscious state**
   - **Confusion**
   - Document the GCS

2. Vital signs, in particular **fever.**

3. Signs of trauma.

4. Signs of meningeal irritation:

   These may indicate, SAH/ meningitis, but it must be noted that absence of these signs will not rule these conditions out.

- Neck stiffness
- Positive Kernig's sign, (pain and hamstring spasm resulting from passive attempts to straighten leg with hips flexed).
- Brudzinski's sign, (passive neck flexion resulting in flexion of hips and knees)
- Photophobia, a very non specific and subjective finding, and overall a much less reliable feature.

5. Neurological signs, including:
   - Horner's sign
   - CN lesions:

     In particular:

     ♥ 2nd cranial nerve: visual field defects.

     ♥ 3rd cranial nerve (posterior communicating artery aneurysm).

     ♥ 6th cranial nerve (raised intracranial pressure)

     ♥ Ophthalmoplegia
   - Long tract signs - hemiplegia
   - Cerebellar signs.
6. Temporal artery tenderness:
   - This is suggestive of temporal arteritis.
7. Signs of possible **cervical arterial dissection:**
   - Horner's syndrome
   - Tenderness along the line of the carotid artery
8. Fundoscopy for papilloedema:
   - Though this can be a difficult sign to detect for those not experienced in looking at fundi.

     If present it is helpful, but if not present this does not rule out the possibility of raised intracranial pressure.
9. Consider the possibility of referred pain:

- Eye - glaucoma
- Palpate TMJ, mouth opening/closing
- Dental lesions.

Investigations

None may be necessary in some cases.

Investigations will be guided by the clinical findings and the index of suspicion for a particular pathology.

The following will need to be considered.

Blood tests:

1. FBE
2. U&Es/ glucose
3. LFTs
4. Inflammatory markers:

   CRP:

   - Useful if infection/ vasculitis is suspected.

   ESR:

   - If **giant cell arteritis** (**temporal arteritis)** is suspected

Others as indicated:

5. Cooximetry for CO levels, if CO poisoning is suspected.

CT scan /CT angiogram:

CT scan or **CT scan with contrast** and/or **CT angiogram** (depending on the index of suspicion for any given condition) are the key initial imaging investigations in any patient with headache of uncertain origin.

In general terms:

- **Plain CT** is usually sufficient for cases of trauma: e.g. extradural/ subdural hematoma.
- **CT with contrast** for tumours/ venous dural thrombosis.
- **CT angiogram** for stroke syndromes/ SAH

The need for CT can only be judged in the light of each individual case

The urgency of the scan will depend on the degree of suspicion for a particular pathology and how unwell the patient is.

There must always be careful consideration of the Red Flags of Headache presentations, (see above).

Once the decision has been made that an **ED** patient requires a CT scan because of headache:

- It must be done before the patient leaves the department, *(never organize an "elective" outpatient CT for this indication)*

- The radiologist must review the CT scan **before the patient is discharged.**

    - ♥ In cases out of hours and where the clinical index of suspicion is low for serious pathology, the patient may be kept under observation till the morning for a CT report, but should not be sent home before this is done.

If the CT scan result is "normal" or unhelpful, yet the patient still has significant distress or appears unwell, consider the following:

- Could this still be a SAH (**see also SAH document**)

- Does the CT scan result require a closer look or indeed a second opinion by a more senior radiologist?

    Some causes of severe headache can be difficult to detect on CT examination (even with contrast) and may require an MRI scan, (see below).

MRI/ MRA/ MRV:

MRI may be necessary if significant clinical concern remains regarding the cause of a patient's headache and the CT scan result has not been diagnostic.

MRI is better than CT in detecting a number of intracranial pathologies.

Examples include:

1. Certain space occupying tumors

2. Venous sinus thrombosis

3. Early infarction, with edema

4. Isodense subdural hematomas.

5. Some CNS infections:

- Meningoencephalitis:
    - ♥ In particular herpes encephalitis.

6. Some pituitary pathologies:
    - Pituitary haemorrhage, (pituitary apoplexy).
7. Acute central demyelinating disease.
8. RCVS
9. PRES
10. Some toxic encephalopathies:
    - e.g. Carbon monoxide poisoning.

MRI is also the preferred modality when CT is absolutely or relatively contraindicated in some situations:

1 Pregnant patients:
- Note however that CT is not absolutely contraindicated in pregnant patients in whom there is concern for serious pathology, requiring urgent investigation.

2 Patients who require IV contrast, but have a significant contrast allergy.

Lumbar Puncture:

If meningitis, encephalitis or SAH are being considered.

Subactute CNS infections such as cryptococcus or viral meningitis may also need to be excluded.

A CT scan of the brain should be done first to exclude the possibility of a space occupying lesion or other evidence of raised ICP.

LP should **not** be done if there is a suspicion of raised ICP.

Management

This will obviously depend on the severity of the symptoms and the causative pathology.

Beware of trying to provide a specific diagnosis for every **primary headache patient** even if according to ICHD guidelines, in the ED

Studies have demonstrated that it is difficult to assign a specific headache diagnosis in the emergency setting. Primary headache disorders have variable presentations and often require multiple similar headaches for a clear diagnosis by ICHD-2 guidelines. Further, an incorrect diagnosis can mislabel a patient with a chronic headache disorder, leading to anchoring bias by future physicians.

Important considerations include:

1. Attend to any immediate ABC issues.

2. Analgesia:

   Analgesia needs to be tailored to the severity of the patient's symptoms and according to the condition being treated.

   - Simple oral analgesics may be tried initially.
   - Opioids:
     - ♥ These may be necessary in those with more severe symptoms.
     - ♥ **In general they should be avoided for chronic / benign conditions.**
   - Sumatriptan (or similar) is the treatment of choice in migraine, **not** opioids.

   Once opioid analgesia is given for headache close observation in the ED is mandatory, as signs of raised ICP may be masked.

   Opioid analgesia will mandate a CT for any headache of unknown origin.

   It is important to recognize that resolution of a headache, either spontaneously or by medication (including sumatriptan), does NOT rule out a potentially serious cause for headache. [1, 2]

   All other associated clinical features should also be taken into consideration, when deciding if further investigation is warranted, even if the headache has resolved.

3. Antibiotics:

   - If a serious CNS infection is suspected, always treat immediately.

     Do not let the CT or MRI delay treatment.

4. Steroids:

   - These are useful in cases of cerebral edema due to tumours

Disposition

All neurosurgical conditions should be discussed with the neurosurgeon on call.

If investigations including CT scan/ CT angiogram have been inconclusive yet serious clinical concern remains it is safest to admit the patient for further observation, specialist opinion and possible MRI if this has not been done from the ED

Depending on the case as well as local policies, an SSU admission may appropriate.

References:

1. Pope V. J et al. Favorable response to analgesics does not predict a benign etiology of headache. Headache, 48: 944, June 2008.

2. Pfadenhauer K. et al. The risks of sumatriptan in patients with unrecognized subarachnoid hemorrhage. Cephalgia 26 (3): 320, March 2006.

3. Kelly A.M, Headache in Textbook of Adult Emergency Medicine, Cameron et al 4th ed 2015.

Dr J Hayes

Reviewed 18 August 2016.