

Headaches also known as **Cephalgia**

Headaches was once believed to be caused by demons.



- Exorcism
- Head in the oven
- Metallic tractor pulls out pain (Doctrine of humors)

### **Surgical cures for headaches**

Trepanation → Drills holes in the head

30% chance survival.

You had that hole in your head for life.

### **Modern practitioners of trepanation**

The brain does not feel any pain.

The pain is felt in thin tissue surrounding the skull.

12 types of headaches.

60 sub-types.

### **Separated in 2 classes**

Muscular : muscle band around skull (stress related)

You can take

- A.S.A
- Tylenol
- Advil
- Naproxen

Vascular (3 types)

1. Toxic (poison) caused by vasodilation in tissue.

Ex : hangover

Metabolism of alcohol contributes or helps

Ethyl alcohol



Alcohol dehydrogenase

Acetaldehyde (10x worse than alcohol itself)

↓ Acetaldehyde dehydrogenase  
Acetic Acid

2. Migraine

3. Cluster (only old people get that)

Aging adds pain → Presence of congener ↑ Severity of hangover

Color has an important role in hangover  
The darker the alcohol the worst your hangover is.

Liver makes acetaminophen toxic

Don't take acetaminophen for hangover.

Acetaminophen → Glucuronyl transferase → Removal from body

↓  
Cytochrome P 450

Toxic metabolite → Liver damage

some red wines contain histamine. (Contains allergic)

Old cheese contains tyramine

Histamine (chocolate) also contains phenylethylamine (it triggers some headaches)

Hotdogs contains nitrites



Nitroglycerin is potent vasodilator.

Monosodium glutamate (Msg)

Seaweed gave food taste back in the day (used as spice)

Kikunae Ikeda (1907)

Msg known as kwok syndrome or Chinese restaurant syndrome



Doctor who invented the syndrome.

Msg used in oriental cooking

Some people avoided msg but it does not cause headache.

Msg is in everything we buy (prepared foods)

Msg is disguised as hydrolyzed vegetable protein.

Msg is a normal human metabolite

- Constitutes approximately 5% of our protein
- It is produced constantly in our body

To treat toxic headaches

- A.S.A
- Ibuprofen
- Naproxen

### Acetaminophen and toxic headaches

Increased liver function causes acetaminophen toxicity

Also known as liver damage.

Caffeine may help reduce pain.

Muscular headaches caused by stress

Vascular headaches caused by vasal dilation caused by poison

### Migraines

a migraine headache is a vascular headache

The name migraine in drug boxes is used to increase marketing.

Migraines is not a common type of headache only 18% of females and 6% of men get them.

Migraines have very complicated phases

It is not just a headache it is a full experience.

Stage 1 : vasoconstriction blood vessels get smaller.

Stage 2 : vasal dilation this is caused by pain.

A chemical substance or behaviour can cause migraines

It can be triggered by many different things.

Migraines proceeds through 4 phases.

1. Prodrome : warning that an event is coming can warn 1-2 days before, mood swings are common signals. (30-40% percent of people get it)

2. Aura : 1/3 of people get it 1-2 hours before pain can be manifested in a variety of ways, can use prescription or OTC medication.

Scotamos visual disturbances, things get blurry, olfactory hallucinations (you smell things)

Auditory hallucinations (hear sounds further away)

Vertigo/reduced sensation (hypo sensitive)

3. Pain : feel pain in half of the head only, nausea, bad stomach, movements make it worse.

Postdrome : you feel tired, depressed, hungover feeling, euphoria feeling

Treatments :

Pain medications

A.S.A

Acetaminophen

Ibuprofen

Naproxen

Triptants can abort migraine when warnings occurs.

Rye bread common in medieval Europe

Ergot grows on rye

Ergot is a fungal infection and releases poison.

St Anthony's fire from vasoconstriction caused by ergot.

Ergot can cause muscle spasms.

Midwives used ergot for labour

Ergot is a powerful hallucinogen

Ergot might cause demonic possessions (in medieval times)

If anyone was accused of being a witch they were tortured or killed, no accountability if accused you were punished.

Exorcism still exists in modern Canada.

Ergot has medicinal properties. Can be used in child birth and it's extracts were used to cure migraines for 200 years.

Too much ergot is dangerous.

In 1918 the active substance in ergot was isolated (ergotamine) nowadays proper dosage

could be given and the active substance was measured accurately. (Arthur Stoll)

It was used in Cafergot for migraine. (Still available today)

Ergot is not an ideal drug; it has side effects but also beneficial effects as well.

Limited side effects

- Low incidence

- Low severity

Cheap to manufacture

Patentable

**Albert Hoffman**

Was discovering drugs for psychiatric use and discovered LSD by mistake

**Migraine starts with serotonin**

The level of serotonin changes during migraine.

The amount drops during the aura phase; it prevents migraine by replacing missing serotonin drug.

When nerve signals go around the body they have a domino effect (chemical reaction)

Signals travel down a nerve cell, chemical squirted from one cell to another. The second cell sucks it up and causes the chemical reaction.

When there isn't enough serotonin you supplement it with drugs, the idea is to replace serotonin and reduce migraine.

Serotonin is a poor drug, it's used in all parts of the brain and you wouldn't want serotonin to go in the wrong places.

Serotonin can not go into the brain. Very preventive to go in the brain.

Molecule doesn't know what to do in the body

You engineer drug according to receptor, selectivity engineer according to shape.

Serotonin selectively targets migraines.

Triptan medication must have the name with them

Better to have more drug variety because different drugs work in different ways.

**Treat headache with pain killer.**

Do not take acetaminophen for toxic headaches; better to take caffeine (vascular constrictor)