

Task Description

Create a simple symptom checker using a decision tree or rule-based system.

Define symptoms: Select a common condition (e.g., headache, fever, cough).

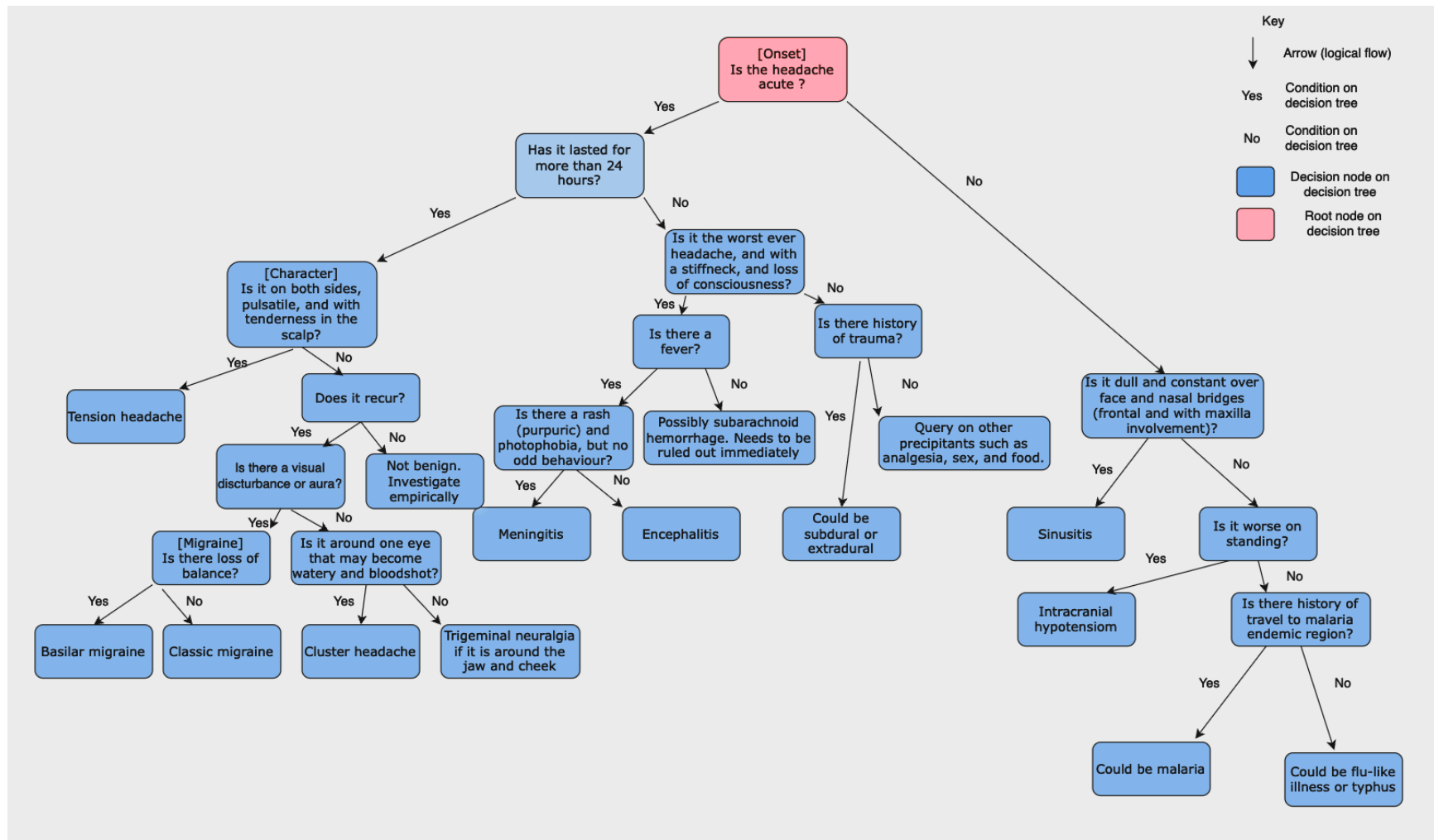
A symptom is something that a person feels or experiences that may indicate that they have a disease or condition¹. Symptoms can only be reported by the person experiencing them. They cannot be observed by a health care provider or other person and do not show up on medical tests. Some examples of symptoms are pain, nausea, fatigue, and anxiety. The universality of this term belies its nuanced nature which is influenced by a myriad of social, cultural, and subjective factors².

A headache is a common symptom for a continuum of diseases with primary, secondary, and iatrogenic aetiologies, and is in itself a frequent cause of distress and morbidity^{3,4}. The discrete nature of diseases evoking this symptom is contentious, but highlights the dynamism that underpins our understanding of neurological diseases⁴.

Headache disorders, characterized by recurrent headaches, are among the most common disorders of the nervous system⁵.

Globally, headache disorders affect approximately 40% of the population, or 3.1 billion people in 2021, and are more common in females compared to males. They are among the top three most common neurological conditions for most age groups, starting with age 5 and remaining in the top three until the age of 80. Despite some regional variations, headache disorders are a worldwide problem, affecting people of all races, income levels and geographical areas⁶.

Create a decision tree: Outline a basic decision tree based on common symptoms related to the chosen condition.
Common condition chosen: headache disorder⁷.



Develop rules: Alternatively, create a set of simple rules to determine potential diagnoses based on symptoms.

Alternate rule system chosen for headache disorder⁷.

1. Onset

Is the onset acute?

If yes, proceed to 2.

Is the onset chronic?

A dull and constant pain over the forehead and nasal bridges (frontomaxillary involvement) is highly indicative of sinusitis. But if this is absent, then you should query for exacerbation with positioning.

Does it get worse with standing? If yes, this is highly indicative of intracranial hypotension.

If no, proceed to b)

Does the travel history reveal a positive history of a malaria endemic region? If yes, this could be malaria. If not, proceed to c)

This could be a flu like illness or typhus.

2. Time Duration

Is it less than 24 hours?

Is it the worst headache ever, a stiff neck, and associated with loss of consciousness?

If yes, proceed to a). If no, then inquire about trauma.

If there's no history of trauma then proceed to 5. If there was a history of trauma this could be a subdural or extradural, and prompt imaging would be required.

Is there a fever? If yes, proceed to b). If not, this could be a subarachnoid hemorrhage and needs to be ruled out immediately.

Is there a rash, light sensitivity, but no changes or oddities in behaviour? If yes, then this could be meningitis. If no, then this could be encephalitis. The cortical involvement could explain the behavioural change.

Is it more than 24 hours?

If yes, then proceed to 3.

3. Character

Is it on both sides, pulsatile, and with tenderness in the scalp? If yes, then this could be a tension headache. If no, proceed to 4.

4. Frequency and Recurrence

Is there an aura or sensory disturbance?

If yes, this could be a migraine. Query for gait, and imbalance to further classify this into either classic migraine (without gait disturbance and imbalance) or basilar migraine (with gait disturbance and imbalance).

If no, then proceed to a).

Is it around one eye that becomes teary and bloodshot?

If yes, this could be a cluster headache.

If no, then this could be trigeminal neuralgia if it is around the jaw and cheek.

5. Precipitants

Is there history of analgesia? sexual intercourse, and foods such as chocolate, cheese, and coffee?

If yes, then proceed to 6.

If no, then query for history of foods such as chocolate, cheese, and coffee: these are precipitants that could cause a headache. Their mechanism of precipitation has a common pathway of sympathetic nervous system through their direct and indirect stimulants which could be taurine for cheese (indirect), and caffeine for coffee.

6. Drug History

Mixed analgesics such as paracetamol and codeine or opiates, ergotamine, and triptans interfere with vascular smooth muscle tension directly or indirectly through the prostaglandin pathways. Consider withdrawal of the drugs, but issue a prophylactic substitute for ergot alkaloids and triptans used in management of migraines.

References

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