

HEADACHE - RED FLAGS + ORANGE FLAGS

SNNOOP10 mnemonic is an expanded systematic framework for identifying **red and orange flags** that suggest secondary headaches requiring further evaluation. The mnemonic comprises **15 distinct red flags** organized into 10 categories:

Reference: Open Evidence

S - Systemic symptoms including fever, hypertension, weight loss

Differential: Meningitis, encephalitis, carcinoid syndrome, Lyme disease, pheochromocytoma, collagen vascular disease

Workup: Blood tests, lumbar puncture, neuroimaging, skin biopsy

N - Neoplasm history

Differential: Brain metastasis, intracranial neoplasm

Workup: Neuroimaging

N - Neurologic deficit (including decreased consciousness)

Differential: CNS infection, vascular malformation, stroke, intracranial mass lesion

Workup: Blood tests, neuroimaging, neurology consultation

O - Onset sudden/abrupt (thunderclap headache - peaks within seconds to minutes)

Differential: Subarachnoid hemorrhage, other cranial or cervical vascular disorder, posterior fossa mass lesion

Workup: Neuroimaging, lumbar puncture

O - Older age (onset after 50-65 years)

Differential: Giant cell arteritis, cranial or cervical vascular disorder, neoplasm

Workup: ESR, CRP, neuroimaging

P - Pattern change or recent onset of new headache

Differential: Mass lesion, intracranial disorder, medication overuse or use disorder

Workup: Neuroimaging, medication review, urine drug screen

P - Positional headache

Differential: Intracranial hypertension or hypotension (e.g., CSF leak)

Workup: Neuroimaging

P - Precipitated by sneezing, coughing, or exercise

Differential: Posterior fossa lesion (e.g., Chiari malformation), subarachnoid hemorrhage

Workup: Neuroimaging, lumbar puncture

P - Progressive headache and atypical presentations

Differential: Mass lesion, intracranial disorder

• Workup: Neuroimaging

P - Papilledema

• Differential: Intracranial hypertension, mass lesion, nonvascular intracranial disorder

• Workup: Neuroimaging, lumbar puncture, ophthalmology consultation

The SNNOOP10 adds **5 additional red flags** not included in the original SNOOP4:

Pregnancy or puerperium

• Differential: Cranial or cervical vascular disorder, hypertension-related (e.g., preeclampsia), cerebral sinus thrombosis, postdural puncture

• Workup: Blood tests, neuroimaging

Painful eye with autonomic features

• Differential: Ophthalmic disorder, pathology of posterior fossa, pituitary, or cavernous sinus, Tolosa-Hunt syndrome

• Workup: Neuroimaging, ophthalmology consultation

Posttraumatic onset of headache

• Differential: Acute or chronic posttraumatic headache, subdural hematoma

• Workup: Neuroimaging (brain, skull, possibly cervical spine)

Pathology of immune system (e.g., HIV)

• Differential: Opportunistic infection (e.g., meningitis, brain abscess, metastasis)

• Workup: Neuroimaging, lumbar puncture

Painkiller overuse or new drug at onset of headache

• Differential: Medication overuse headache, drug incompatibility

• Workup: Medication review and reconciliation

The SNNOOP10 list demonstrated **100% sensitivity** (95% CI: 90.2%-100%) in detecting high-risk headache disorders in an emergency department validation study. The most sensitive individual items were neurologic deficit (75.5%), pattern change or recent onset (64.4%), and onset after 50 years (64.4%). The most specific items were posttraumatic onset (94.5%), neoplasm history (89.1%), and systemic symptoms (89%).

Emergent evaluation is warranted for:

• Thunderclap headache

• Fever with meningismus

• Papilledema with focal neurologic signs or impaired consciousness

• Acute glaucoma symptoms

Note - Other SNNOOP10 features may require urgent evaluation within hours to days, depending on clinical context