



[Home](#) → [Health Topics](#) → Encephalitis

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Encephalitis

What is encephalitis?

Encephalitis is inflammation (swelling) of the brain. It can happen when an infection or medical condition that affects the brain activates your immune system. The inflammation can cause a wide range of symptoms. In extreme cases, it can lead to brain damage, stroke [<https://medlineplus.gov/stroke.html>] , or even death.

What causes encephalitis?

There are different types of encephalitis, based on what the cause is. The two main types are infectious encephalitis and autoimmune encephalitis.

Infectious encephalitis is usually caused by a virus [<https://medlineplus.gov/viralinfections.html>] . In fact, viruses are the most common cause of encephalitis. Some of the different viruses that cause it include:

- Herpes viruses, including herpes simplex [<https://medlineplus.gov/herpessimplex.html>] (HSV), the Epstein-Barr virus (which causes infectious mononucleosis [<https://medlineplus.gov/infectiousmononucleosis.html>]) and the varicella-zoster virus (which causes chickenpox [<https://medlineplus.gov/chickenpox.html>]).
- Viruses you can get if you are bitten by an infected tick [<https://medlineplus.gov/tickbites.html>] , such as tick-borne encephalitis (TBE virus) and Powassan virus.
- Viruses you can get if you are bitten by an infected mosquito [<https://medlineplus.gov/mosquitobites.html>] , such as eastern equine encephalitis virus, West Nile virus [<https://medlineplus.gov/westnilevirus.html>] , and La Crosse virus.
- Enteroviruses, which are a common group of viruses that mostly cause mild illness or respiratory infection. These infections usually happen in the summer and fall.

Bacteria [<https://medlineplus.gov/bacterialinfections.html>] , fungi [<https://medlineplus.gov/fungalinfections.html>] , and parasites [<https://medlineplus.gov/parasiticdiseases.html>] can also cause infectious encephalitis. But this is not common.

Autoimmune encephalitis happens when your immune system mistakenly attacks healthy brain cells. It can be triggered by conditions such as certain cancers, benign tumors [<https://medlineplus.gov/benigntumors.html>] , and infections. Sometimes the cause is not known.

Who is more likely to get encephalitis?

Anyone can get encephalitis, but you are more likely to get it if you:

- Have a weakened immune system, for example from having HIV [<https://medlineplus.gov/hiv.html>] or taking certain medicines. These could include medicines taken after an organ transplant [<https://medlineplus.gov/organtransplantation.html>] , certain chemotherapy [<https://medlineplus.gov/cancerchemotherapy.html>] medicines, and specialized treatments for certain autoimmune diseases [<https://medlineplus.gov/autoimmunedisases.html>] .
- Are a young child or older adult.
- Live in areas where there are ticks and mosquitoes that carry viruses that can cause encephalitis.

What are the symptoms of encephalitis?

The symptoms of encephalitis can vary a lot, depending on how severe it is. Many people do not have any symptoms. Others may have mild flu-like symptoms such as fever [<https://medlineplus.gov/fever.html>] , fatigue [<https://medlineplus.gov/fatigue.html>] , headache [<https://medlineplus.gov/headache.html>] , or body aches. If encephalitis becomes more serious, it can cause:

- Severe headache
- Stiff neck
- Vomiting [<https://medlineplus.gov/nauseaandvomiting.html>]
- Seizures [<https://medlineplus.gov/seizures.html>]
- Behavior changes
- Drowsiness
- Muscle weakness
- Partial paralysis [<https://medlineplus.gov/paralysis.html>] in your arms and legs
- Coma [<https://medlineplus.gov/coma.html>]

Encephalitis can be dangerous in infants. Their symptoms may include:

- Fever
- Lethargy (weakness or drowsiness)
- Poor feeding
- Vomiting
- Body stiffness
- Unusual irritability or crying
- A full or bulging fontanel (the soft spot on the top of the head)

If you or your child is having symptoms of encephalitis, it's important to get medical care right away.

How is encephalitis diagnosed?

To find out if you have encephalitis, your health care provider:

- Will do a physical exam
- Will take your medical history, which includes asking about your symptoms
- May do a neurologic exam [<https://medlineplus.gov/lab-tests/neurological-exam/>]
- May order imaging tests [<https://medlineplus.gov/diagnosticimaging.html>] , such as a brain CT scan [<https://medlineplus.gov/ctscans.html>] or MRI [<https://medlineplus.gov/mriscans.html>]
- May order an EEG (electroencephalography), which use small electric sensors to measure your brain activity
- May order blood and cerebrospinal fluid (CSF) tests [<https://medlineplus.gov/lab-tests/cerebrospinal-fluid-csf-analysis/>]

What are the treatments for encephalitis?

Most people with encephalitis will need treatment in the hospital. Depending on the cause, treatments may include antiviral medicines, antibiotics [<https://medlineplus.gov/antibiotics.html>] , corticosteroids [<https://medlineplus.gov/steroids.html>] , and other medicines.

For some types of encephalitis, there is no medicine to treat it. But rest, nutrition, and fluids can help your body fight the infection and relieve symptoms.

Some people may need physical, speech, and occupational therapy once the illness is under control.

Can encephalitis be prevented?



There are steps you can take to help prevent encephalitis that is caused by infections:

- Use good hygiene [<https://medlineplus.gov/germsandhygiene.html>] , including washing your hands often with soap and water.



- Don't share food, drinks, utensils, and glasses with other people.
- Get vaccines [<https://medlineplus.gov/vaccines.html>] for viruses that can cause encephalitis.
- Avoid mosquito and tick bites, for example by:
 - Wearing insect repellent with DEET or another U.S. Environmental Protection Agency (EPA)-registered insect repellent. Make sure to follow the instructions for using the repellent.
 - Wearing clothes that cover your arms, legs and feet.
 - Treating your clothing and gear with products containing 0.5% permethrin before you go in grassy or woody areas.

NIH: National Institute of Neurological Disorders and Stroke

Start Here

- Encephalitis [<https://www.ninds.nih.gov/health-information/disorders/encephalitis>]  (National Institute of Neurological Disorders and Stroke)
Also in Spanish [<https://www.ninds.nih.gov/es/health-information/disorders/encefalitis>]
- Inflamed Brain: Recognizing Encephalitis and Meningitis [<https://newsinhealth.nih.gov/2019/04/inflamed-brain>]  (National Institutes of Health)
Also in Spanish [<https://salud.nih.gov/recursos-de-salud/nih-noticias-de-salud/el-cerebro-inflamado>]

Diagnosis and Tests

- Cerebrospinal Fluid (CSF) Analysis [<https://medlineplus.gov/lab-tests/cerebrospinal-fluid-csf-analysis/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/analisis-del-liquido-cefalloarraquideo/>]
- EEG (Electroencephalogram) [<https://www.mayoclinic.org/tests-procedures/eeg/about/pac-20393875?p=1>] (Mayo Foundation for Medical Education and Research)
- Functional MRI (fMRI) [<https://www.radiologyinfo.org/en/info/fmribrain>] (American College of Radiology; Radiological Society of North America)
Also in Spanish [<https://www.radiologyinfo.org/es/info/fmribrain>]
- Head CT [<https://www.radiologyinfo.org/en/info/headct>]  (American College of Radiology; Radiological Society of North America)
Also in Spanish [<https://www.radiologyinfo.org/es/info/headct>]

Prevention and Risk Factors

- Preventing Eastern Equine Encephalitis [<https://www.cdc.gov/eastern-equine-encephalitis/prevention/>] (Centers for Disease Control and Prevention)

Treatments and Therapies

- Eastern Equine Encephalitis: Symptoms, Diagnosis, and Treatment [<https://www.cdc.gov/eastern-equine-encephalitis/symptoms-diagnosis-treatment/>] (Centers for Disease Control and Prevention)


Specifics

- About Eastern Equine Encephalitis [<https://www.cdc.gov/eastern-equine-encephalitis/about/>] (Centers for Disease Control and Prevention)
- About Japanese Encephalitis [<https://www.cdc.gov/japanese-encephalitis/about/>] (Centers for Disease Control and Prevention)
- About St. Louis Encephalitis [<https://www.cdc.gov/sle/about/>] (Centers for Disease Control and Prevention)
- About Tick-Borne Encephalitis [<https://www.cdc.gov/tick-borne-encephalitis/about/>] (Centers for Disease Control and Prevention)
- Eastern Equine Encephalitis: Causes and How It Spreads [<https://www.cdc.gov/eastern-equine-encephalitis/cause-and-spread/>] (Centers for Disease Control and Prevention)

Statistics and Research

- Data and Maps for Eastern Equine Encephalitis [<https://www.cdc.gov/eastern-equine-encephalitis/data-maps/>]
(Centers for Disease Control and Prevention)

Clinical Trials


- ClinicalTrials.gov: Encephalitis [<https://clinicaltrials.gov/search?cond=%22Encephalitis%22&aggFilters=status:not%20rec>]
 (National Institutes of Health)

Journal Articles

References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: FLAIR hyperintense cortical lesions in myelin oligodendrocyte glycoprotein-associated encephalitis with seizures... [<https://www.ncbi.nlm.nih.gov/pubmed/40740785>]
- Article: Coexistence of CN1A autoantibodies in GAD65 encephalitis exacerbates neurodegeneration : Novel... [<https://www.ncbi.nlm.nih.gov/pubmed/40713786>]
- Article: The characteristic change of autoimmune encephalitis after the COVID-19 epidemic in... [<https://www.ncbi.nlm.nih.gov/pubmed/40691482>]
- Encephalitis -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Encephalitis%22%5Bmajr%3Anoexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+1+Year%22+%5Bedat%5D+NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29+AND+free+full+text%5Bsb%5D+>]

Find an Expert

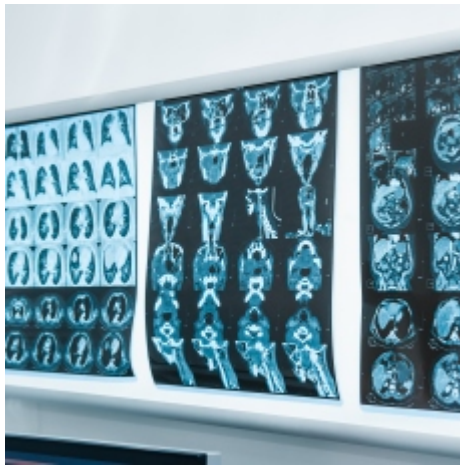
- Centers for Disease Control and Prevention [<https://www.cdc.gov/>]
Also in Spanish [<https://www.cdc.gov/spanish/>]
- National Institute of Neurological Disorders and Stroke [<https://www.ninds.nih.gov/>] 

Teenagers

- Encephalitis [<https://kidshealth.org/en/teens/encephalitis.html>] (Nemours Foundation)
Also in Spanish [<https://kidshealth.org/es/teens/encephalitis.html>]

Patient Handouts

- Cerebral spinal fluid (CSF) collection [<https://medlineplus.gov/ency/article/003428.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/003428.htm>]
- CSF analysis [<https://medlineplus.gov/ency/article/003369.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/003369.htm>]
- Encephalitis [<https://medlineplus.gov/ency/article/001415.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/001415.htm>]
- Japanese Encephalitis Vaccine: What You Need to Know [<https://www.cdc.gov/vaccines/hcp/current-vis/downloads/jepixiario.pdf>] (Centers for Disease Control and Prevention) - **PDF**
- Subacute sclerosing panencephalitis [<https://medlineplus.gov/ency/article/001419.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/001419.htm>]



MEDICAL ENCYCLOPEDIA

Cerebral spinal fluid (CSF) collection [<https://medlineplus.gov/ency/article/003428.htm>]

CSF analysis [<https://medlineplus.gov/ency/article/003369.htm>]

CSF cell count [<https://medlineplus.gov/ency/article/003625.htm>]

Encephalitis [<https://medlineplus.gov/ency/article/001415.htm>]

Head CT scan [<https://medlineplus.gov/ency/article/003786.htm>]

Subacute sclerosing panencephalitis [<https://medlineplus.gov/ency/article/001419.htm>]

Related Health Topics

Meningitis [<https://medlineplus.gov/meningitis.html>]

West Nile Virus [<https://medlineplus.gov/westnilevirus.html>]

National Institutes of Health

The primary NIH organization for research on *Encephalitis* is the National Institute of Neurological Disorders and Stroke [<http://www.ninds.nih.gov/>]

Other Languages

Find health information in languages other than English [<https://medlineplus.gov/languages/encephalitis.html>] on *Encephalitis*

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