

Include in pathway (Patients must be all of these):

- Patients with suspected viral meningitis.
- Patients with stable vital signs and normal neurological exam.
- Patients with vomiting or dehydration requiring intravenous fluids and/or antiemetics.
- Patients with severe head or neck pain not relieved by oral analgesics.

Exclude from the pathway (Patients with any of these):

- Patients less than 2 months old
- Patients with greater than 500 WBC's on the CSF fluid.
- Patients with bacterial organisms seen on the CSF gram stain.
- Patients who are immunocompromised.
- Patients with altered mental status or abnormal neurologic exam.
- Patients with suspected herpes meningoencephalitis.
- Pretreatment with antibiotics within the last 14 days.
- Patients with suspected TB, cocci, or cryptococcal meningitis.

Patients should be considered for removal from the pathway if:

(Nursing staff should contact physician if any of the following apply)

- No improvement in clinical condition in 48 hours.
- Positive CSF culture or blood culture.
- Primary diagnosis seems questionable.
- Patient develops altered mental status, seizures, or decreased level of consciousness.

Criteria for Admission:

- Inability to tolerate PO fluids.
- Persistent vomiting.
- Need for IV analgesics to control pain.

Criteria for Discharge:

- Able to take PO fluids well
- Pain easily controlled with oral analgesics.
- Well hydrated

Background Information:

- Enteroviruses account for 85-95% of all cases in which a pathogen is identified.
- Infection with enterovirus is spread directly from person to person, with a usual incubation period of 4-6 days. Most cases occur in the summer and fall.
- Cerebrospinal fluid findings in viral meningitis include a WBC count of <1,000, glucose level is usually normal, and protein may be normal or slightly elevated.
- **Antibiotics are not indicated in the treatment of viral meningitis.**
- Complications of viral meningitis include altered mental status, lethargy, seizures.
- Mainstays of treatment include intravenous fluids for patients with dehydration or inability to tolerate PO fluids, analgesics as needed for pain, and antiemetics as needed for nausea/vomiting.

Goals:

- Reduce unnecessary use of antibiotics.
- Educate families about good hand washing.

Weight: _____

Allergies: _____

Time/ _____
Date: _____

General

- 1) Diagnosis: Viral Meningitis
- 2) Estimated length of stay = 1-2 days
- 3) Condition: Stable
- 4) Vitals (including BP), neurological checks and pain assessment every 6 hrs and PRN for pain
- 5) Activity: As tolerated for age
- 6) Contact precautions
- 7) Accurate I's & O's (every 4 hrs to determine PO intake and output)
- 8) Daily weights
- 9) Initiate "Learning Assessment" and implement viral meningitis education
- 10) On admit, assess discharge needs and make appropriate referrals (see pediatric admission database)
- 11) Notify physician of any mental status changes or seizures

Education:

- 1) **BEGIN EDUCATION AT ADMISSION**
- 2) Review viral meningitis "Patient Education Sheet" with family
 - Teach signs of dehydration, signs of inadequate PO intake
 - Review who to contact for problems and reasons to call physician or return to ER
 - Emphasize good hand washing techniques

Diet & Fluids

- 1) Diet
 - If patient has nausea and/or vomiting start with a clear liquid diet and advance as tolerated to regular diet for age.
 - If patient is without nausea/vomiting start regular diet as tolerated.

Fluids

**ORAL FLUIDS ARE THE PREFERRED SOURCE OF HYDRATION.
ALWAYS ATTEMPT ORAL FLUIDS FIRST.**

- 1) If patient is vomiting or unable to tolerate PO fluids start maintenance fluids.
Maintenance Fluids (**PO plus IV**)

0-10	Kg	4 mL/kg/hr
11-20	Kg	40 mL/hr + (2 mL/kg/hr for each kg > 10)
>20	Kg	60 mL/hr + (1 mL/kg/hr for each kg > 20)

Choice of IV fluids:

D5 ½ NS + 20 mEq KCl/L

If serum bicarbonate (total CO₂) < 15, substitute 20 mEq/L K-Acetate instead of KCl in IV fluids
(nurse to call pharmacy)

If repeat serum bicarbonate (total CO₂) > 20, resume use of KCl instead of K-Acetate
(nurse to call pharmacy)

Once patient taking adequate PO's without vomiting - wean IV to saline lock PIV.

Physician's Signature/ID Number: _____ Date: ____/____/____ Time: _____

Viral Meningitis

page 1 of 2

Patient Label

0032



pathway 06/2010

Physician's Order Sheet

Weight: _____

Allergies: _____

Time/ _____
Date: _____

Diagnostic Tests

- Enterovirus PCR on CSF if not already sent.
- If initial bicarbonate (total CO₂) less than 15 on admission repeat BMP 12 hours after inpatient admission.
- If CO₂ less than 12 or sodium less than 130, notify the physician.

Medications

- 1) Acetaminophen 15 mg/kg (max. dose=650 mg) PO/PR every 4 hrs PRN T > 38.0 C-38.9 C or mild pain (max. dose= 75 mg/kg/day or 4 gms/day; whichever is less).
 - If patient's temperature remains above 38.0 C one hour after administration, then give Ibuprofen.
- 2) Ibuprofen 10 mg/kg (max. dose=400 mg) PO every 6 hrs PRN T > 38.9 C or moderate pain.
 - If patient's temperature remains above 38.0 C one hour after administration, then give Acetaminophen.
- 3) Ondansetron 0.1 mg/kg/dose - (max dose of 4 mg per dose) IV every 8 hours as needed for nausea or vomiting.
- 4) Morphine 0.1 mg/kg/dose (max dose of 4 mg) IV every 4 hours as needed for severe pain.
(nurse to contact physician for unrelieved pain)

Follow-up

- 1) Place preprinted discharge instructions in chart.
- 2) FAX discharge instructions (once signed by physician) to primary care physician.

Physician's Signature/ID Number: _____ Date: ____/____/____ Time: _____

Viral Meningitis

0032

pathway 06/2010



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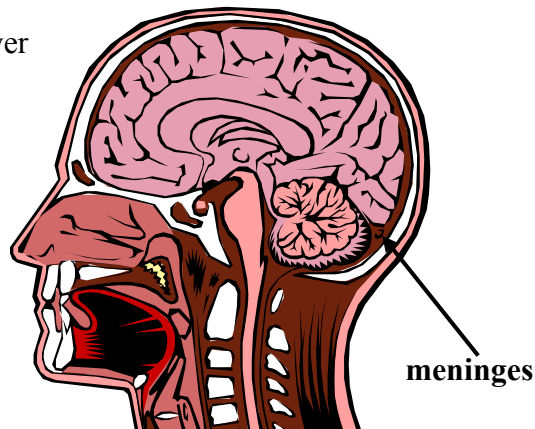
What is viral meningitis?

It is swelling and infection of the **meninges**. The meninges cover the brain and spinal cord. Within the meninges is fluid that cushions and protects the brain and spinal cord. This fluid can also be infected. The infection is caused by a virus.

How did my child get meningitis?

You can get viral meningitis from someone who is infected with a virus. There are many different types of viruses that can cause viral meningitis. Ways to spread infection after touching someone who has a virus:

- sharing drinking glasses or food
- shaking hands
- rubbing your eyes, nose, or mouth
- changing diapers and not washing your hands



How will I know if my child has meningitis?

Not every child or infant will have the same symptoms. Some of the most common symptoms are:

- fever
- severe headache
- stiff neck
- irritability, crying, difficult to console
- being sensitive to light
- drowsiness, confusion, or change in behavior
- nausea, vomiting
- sleeping more than usual
- poor feeding or refusing to eat
- high-pitched cry, arching back in infants

The symptoms of *viral* meningitis can be the **same** as *bacterial* meningitis. When meningitis is caused by a virus, it is serious, but rarely causes death. When bacteria causes meningitis it is very serious and can cause death if not treated with antibiotics right away. If you think your child has meningitis you should take him or her to the emergency department right away.

What can I do to prevent viral meningitis?

If you are around someone who is sick, **wash your hands frequently**. When a child is ill, do not allow other siblings to have close face to face contact. After changing diapers or using the restroom, wash your hands and teach your children to wash their hands. Cough or sneeze into a tissue when possible. Wash hands after using facial tissues. Discourage sharing of drinking and eating utensils.

What is the treatment for viral meningitis?

There is no medicine to treat viral meningitis. Antibiotics will not help viral illnesses. It could take up to 2 weeks for your child to recover completely. During recovery you may do the following for your child:

- Encourage rest
- Offer plenty of fluids
- Use medicine to treat fever and headache
- Keep your child's room quiet and calm, keep the lighting down

When should I call the doctor?

Call your child's doctor if:

- Symptoms become worse (fever becomes higher, headache or stiff neck worsens, vomiting, etc.)
- You notice a change in your child's behavior
- Your child has seizure activity (jerking and shaking of the body, arms, or legs)

When should I call 911?

Call 911 if your child:

- Makes a grunting noise when breathing
- Turns blue or gray in color
- Passes out
- Stops breathing

START CPR IF NEEDED.

Discharge Sheet

For Hospital Use Only

Dictation: 1-800-411-1001 (#963)

Discharge sheet FAXed to PCP _____
initial/date

D/S Job #: _____

Follow-up appointment SCHEDULED with PCP _____
initial/date

PATIENT'S NAME: _____ DISCHARGE DATE: _____

Dx: Viral Meningitis

Hospital Course

- Patient admitted with signs/symptoms consistent with viral meningitis
- CSF: WBC _____ Glucose _____ Protein _____ CSF culture _____ Enterovirus PCR _____

Complications during hospitalization: _____

DISCHARGE CONDITION: _____ **DISCHARGE WEIGHT:** _____

Instruction to Patient

Activity:

Diet: Encourage Fluids

Medications: See Medication Reconciliation Sheet

Follow Up: _____

Additional instructions: Good handwashing. Notify primary care physician or return to emergency department if fever worsens, headache worsens, change in child's behavior or seizure activity

Reference: Patient Education Sheet

Signed: _____ M.D. _____

Attending Physician

Primary Care Physician

Signature of Parent or Guardian

Attending Resident

City

Viral Meningitis

0083



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Discharge Instructions