

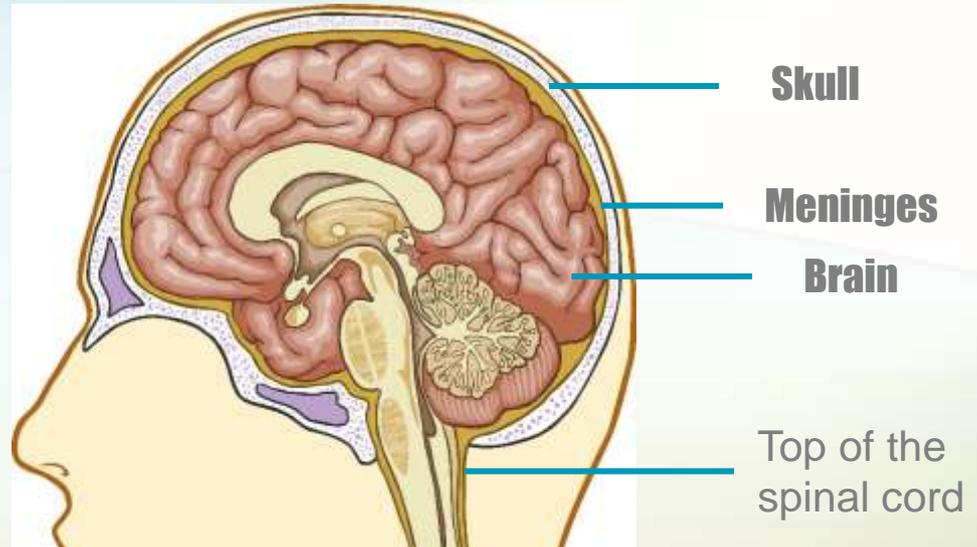


# **Viral and Bacterial Meningitis**

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# What is meningitis?

Meningitis is an infection which causes inflammation of the membranes covering the brain and part of spinal cord.

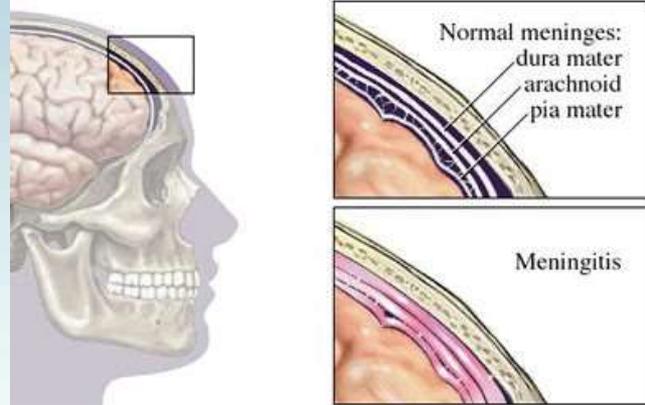


## What is septicaemia?

Some bacteria that cause meningitis can also cause septicaemia (blood poisoning). Septicaemia is a cause of sepsis - a life-threatening condition that arises when the body's response to an infection injures its own tissues and organs.



# Meningitis.....



- **Non-bacterial meningitis is often referred to as ‘aseptic meningitis’ – eg. viral meningitis**
- **Bacterial meningitis may be referred to as ‘purulent meningitis’.**

## Common causes and risks

**The most common causes of meningitis are viral infections that usually resolve without treatment.**

**Bacterial infections of the meninges are extremely serious illnesses, and may result in death or brain damage even if treated.**

# What causes meningitis?

Meningitis is most commonly caused by bacteria or viruses

## Bacterial

- **Meningococcal** (most common cause)
- Pneumococcal
- TB
- Group B streptococcal
- *E. coli*
- Hib

## Viral

- Enteroviruses
- Herpes Simplex
- Mumps (now rare)

# Definitions

- Doctors call meningitis caused by the bacteria *Neisseria meningitidis* meningococcal meningitis
- TB meningitis Tuberculous meningitis is caused by *Mycobacterium tuberculosis*.
- *S. agalactiae*, or group B streptococcus or GBS causes pneumonia and meningitis in newborns and the elderly
- Pneumococcal meningitis is caused by *Streptococcus pneumoniae* bacteria (also called pneumococcus, or *S. pneumoniae*).
- Hib meningitis *Haemophilus influenzae* type b (Hib) is a bacterium that infects the lining of the brain, causing meningitis.

# Viral and bacterial meningitis

## Viral meningitis

Rarely life-threatening

Pain relief, fluids and rest

Not considered to be contagious

After-effects include headaches, tiredness and memory loss

## Bacterial meningitis

Life-threatening

Rapid admission to hospital, treated with antibiotics

Can be contagious and may require public health action

After-effects include deafness, acquired brain injury and limb loss (septicaemia)

# CSF

	Appearance	Opening Pressure mmHg	WBC (cell/ $\mu$ L)	Protein (mg/dl)	Glucose (mg/dL)
<b>Normal</b>	Clear	90-180	< 8	15-45	50-80
<b>Bacterial Meningitis</b>	Turbid	Elevated	>1000-2000	>200	<40
<b>Viral Meningitis</b>	Clear	Normal	<300; Lymphocytic predominance	<200	Normal
<b>Fungal Meningitis</b>	Clear	Normal- elevated	<500	>200	Normal - Low

# **Meningococcal disease**

- **A term used to describe two major illnesses – meningitis and septicaemia (blood poisoning) caused by meningococcal bacteria**
- **Meningococcal disease is the most common cause of bacterial meningitis in the UK**
- **There are five main groups of meningococcal bacteria that commonly cause disease - MenA, MenB, MenC, MenW, MenY**

# **Recognising the signs and symptoms**

- **Meningitis and septicaemia often happen together. Be aware of all the signs and symptoms**
- **Symptoms can appear in any order. Some may not appear at all**
- **Someone with meningitis or septicaemia can get a lot worse very quickly. Keep checking them**

# What are the symptoms?

## Meningitis symptoms alert!



			
Fever/ vomiting	Severe headache	Stiff neck	Dislike of bright lights
			
Very sleepy/ vacant /difficult to wake	Confused/ delirious	Rash	Seizures

**meningitis.org**  
Free helpline  
**080 8800 3344**

Reg. Charity England & Wales  
No 1091105 & Scotland No  
SC037586 Reg. Office:  
Newminster House,  
Baldwin Street, Bristol BS1 1LT

## Septicaemia symptoms alert!

Symptoms can appear in any order. Not everyone gets all symptoms. Septicaemia can occur with or without meningitis.

Other symptoms in babies:

- Unusual grunting sounds
- Tense or bulging soft spot
- Refusing to feed
- Irritable when picked up, with a high pitched or moaning cry
- Stiff body with jerky movements, or floppy/ifeless

If under 3 months fever often absent.

			
Fever/ vomiting	Limb/joint/ muscle pain	Cold hands/ feet/shivering	Pale or mottled skin
			
Breathing fast/ breathless	Rash	Very sleepy/ vacant /difficult to wake	Confused/ delirious

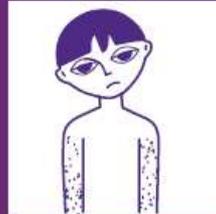
Trust your instincts. Someone can become seriously ill quickly. Get medical help.

# Meningitis Symptoms



			
Fever/ vomiting	Severe headache	Stiff neck	Dislike of bright lights
			
Very sleepy/ vacant /difficult to wake	Confused/ delirious	Rash	Seizures

# Septicaemia Symptoms

			
Fever/ vomiting	Limb/joint/ muscle pain	Cold hands/ feet/shivering	Pale or mottled skin
			
Breathing fast/ breathless	Rash	Very sleepy/ vacant /difficult to wake	Confused/ delirious

# The Rash



- A *non blanching* rash is a late sign of septicaemia
- It is not present in all cases of meningitis

## The tumbler test

Use a clear glass - if the rash does not fade, get medical help immediately

# The Rash



- On dark skin the rash may be more visible in paler areas, e.g.

- soles of feet
- palms of hands
- abdomen
- inside the eyelids
- inside the mouth



Courtesy D A Warrell

# Babies with meningitis or septicaemia can also get these symptoms

Not every baby gets all these symptoms and they can appear in any order.

## Meningitis Baby Watch

Is your baby getting worse fast? Babies can get ill very quickly, so check often.



- Tense or bulging soft spot
- High temperature (more than 2 months: less than 38°C or 100°F)
- Very sleepy/staring, expressionless face, sleepy to wake up
- Irritable when picked up, with a high-pitched, moaning or odd cry
- Extreme shivering
- Pin prick red or white or purple bruise anywhere on the body
- Sometimes diarrhoea
- Cold hands and feet
- Unusual grunting sounds
- Vomiting/refusing to feed
- Breathing fast/difficultly breathing
- Baby's skin getting pale or turning blue
- A stiff body with jerky movements or slow floppy and white
- Possible: Irritability, Home muscle aches or severe limb/joint pain

For information and support call our free helpline  
0800 8800 3344 (UK) 1800 41 33 44 (Ireland)  
helping@meningitis.org  
www.meningitis.org



- Stiff body, jerky movements, or abnormal posturing
- Irritable, particularly when handled, with a high pitched, moaning or odd cry
- Unusual grunting
- Poor feeding
- Vacant staring or poorly responsive or lethargic
- Tense/bulging fontanelle
- Pale or blue skin

## Always remember...

- Trust your instincts
- Symptoms can appear in any order
- Not everyone gets all the symptoms
- Meningitis and septicaemia can occur together or separately
- Someone who has meningitis or septicaemia needs medical help urgently

# A devastating disease

- Meningitis and Septicaemia...
  - Can severely disable
  - Can kill in hours
  - Can affect anyone at any age

# How can meningitis be prevented?

- Vaccines are the only way to prevent meningitis
- BUT vaccines are not available to prevent all types of meningitis
- Know the signs and symptoms to look out for, and the action to take



# The impact of meningitis and septicaemia

- Following bacterial meningitis 10% will die
- It's estimated up to one person in every two or three who survives bacterial meningitis is left with one or more permanent problems
- After-effects are more common following bacterial meningitis or septicaemia

# After-effects following meningitis and septicaemia

## Physical

- Hearing loss
- Sight problems
- Speech problems
- Limb loss, weakness or paralysis
- Skin scarring/damage
- Organ damage

## Neurological and Emotional

- Epilepsy
- Learning and behavioural problems
- Headaches
- Memory and concentration issues
- Emotional difficulties

***Meningitis can devastate lives within hours and its impact can last a lifetime***

# Viral (aseptic) Meningitis

**Definition:** A syndrome characterized by acute onset of meningeal symptoms, fever, and cerebrospinal fluid pleocytosis, with bacteriologically sterile cultures.

## Laboratory criteria for diagnosis:

No evidence of bacterial or fungal meningitis

## Case classification

*Confirmed:* a clinically compatible illness diagnosed by a physician as aseptic meningitis, with no laboratory evidence of bacterial or fungal meningitis

## Comment

Aseptic meningitis is a syndrome of multiple etiologies, but most cases are caused by a viral agent.

# Viral Meningitis

## ❖ Etiological Agents:

- Enteroviruses (Coxsackie's A,B and echovirus): most common.
- Adenovirus
- Measles virus
- Herpes Simplex Virus
- Varicella
- Arbovirus



## ❖ Modes of transmission:

- Primarily person to-person and arthropod vectors for Arboviruses

## ❖ Incubation Period:

- Variable. For enteroviruses 3-6 days, for arboviruses 2-15 days

## ❖ Treatment: *No specific treatment available or symptomatic.*

**Most patients recover completely on their own.**

- **Treat like bacterial meningitis until the 72 hrs culture comes back negative**

# Laboratory Diagnosis

- Virus Isolation
- Serology
  - Neutralization tests or EIAs are used but are very cumbersome and thus not offered by most diagnostic laboratories
- Molecular
  - PCR

# **Viral meningitis - Treatment**

- Supportive
- No antibiotics
- Analgesia
- Fever control
- Often feel better after LP
- No isolation - Standard precautions

# Viral meningitis - Outcomes

- Adverse outcomes rare
- Infants <1 year have higher incidence of speech & language delay
- Neurological complications are rare
- Encephalitis may develop, though this is rare. **(HSV1, Measles, Flaviviruses)**



# **MENINGITIS CAN AFFECT ANYONE**



**It can strike quickly and kill  
within hours**



**saving lives,  
rebuilding futures**

**[www.MeningitisNow.org](http://www.MeningitisNow.org)**

Registered Charity No. 803016 (England & Wales) SC037790 (Scotland)

[www.meningitis.org](http://www.meningitis.org)

Referencing, Some of the slides from the above sites