

1. Case of Encephalitis (1)

Case of Encephalitis

70 year old with gradual decline in activities of daily living, grooming urinary incontinence

Hospitalized
Acute renal failure
Rhabdomyolysis

Seizures, Fever

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2. Case of Encephalitis (2)

Case of Encephalitis

BP 82/54 P80 T39 R Ventilator
Obtunded, Non-responsive
No reflexes

CSF 150 WBC 87% polys

↑ L pupil

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3. Common Viral Causes of Encephalitis

Common Viral Causes of Encephalitis		
Epidemic	Arboviruses	WEE EEE SLE California
	Picornaviruses	Polio Coxsackie Echo
Sporadic	Herpes	Herpes Simplex VZV CMV EBV
	Adenoviruses	
	Postvaccinal	

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4. Herpes Simplex Encephalitis

HERPES SIMPLEX ENCEPHALITIS
<ul style="list-style-type: none">• Non-epidemic, sporadic, acute focal encephalitis• Potentially treatable

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5. HSV Encephalitis (1)

HSV ENCEPHALITIS

- **There is no clinical finding which distinguishes HSV encephalitis**

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6. Clinical Findings in Encephalitis

CLINICAL FINDINGS IN ENCEPHALITIS

- **Symptoms**

Altered Consciousness	97%
Fever	90%
Headache	81%
Personality Change	71%
Seizures	67%
Vomiting	46%
Hemiparesis	33%
Memory loss	24%

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7. Clinical Findings in HSV Encephalitis

CLINICAL FINDINGS IN HSV ENCEPHALITIS

- Signs

Fever	91%
Personality Change	85%
Dysphasia	76%
Automatic dysfunction	80%
Ataxia	40%
Hemiparesis	38%
Seizures	38%
Cranial Nerve Deficits	32%

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8. HSV Encephalitis CSF Fluid Abnormalities

HSV ENCEPHALITIS CSF FLUID ABNORMALITIES

Protein	80 mg/dl	(7-755)	(18% normal)
WBC	130 mm	(0-1,100)	(4% normal)
RBC (>500)	18%		(16% normal)

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9.

HSV Encephalitis (2)

HSV ENCEPHALITIS

- **Neurodiagnostic Exam**
 - **Focal EEG 83%**
 - **Focal CT 71%**

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10.

HSV Encephalitis Diagnosis

HSV ENCEPHALITIS DIAGNOSIS

Neonates

- **CSF culture**

Adults

- **CSF PCR for HSV**
- **Brain biopsy**

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11. Mortality in HSV Encephalitis

MORTALITY IN HSV ENCEPHALITIS

- **Age**
- **Level of consciousness**
- **Duration of disease**

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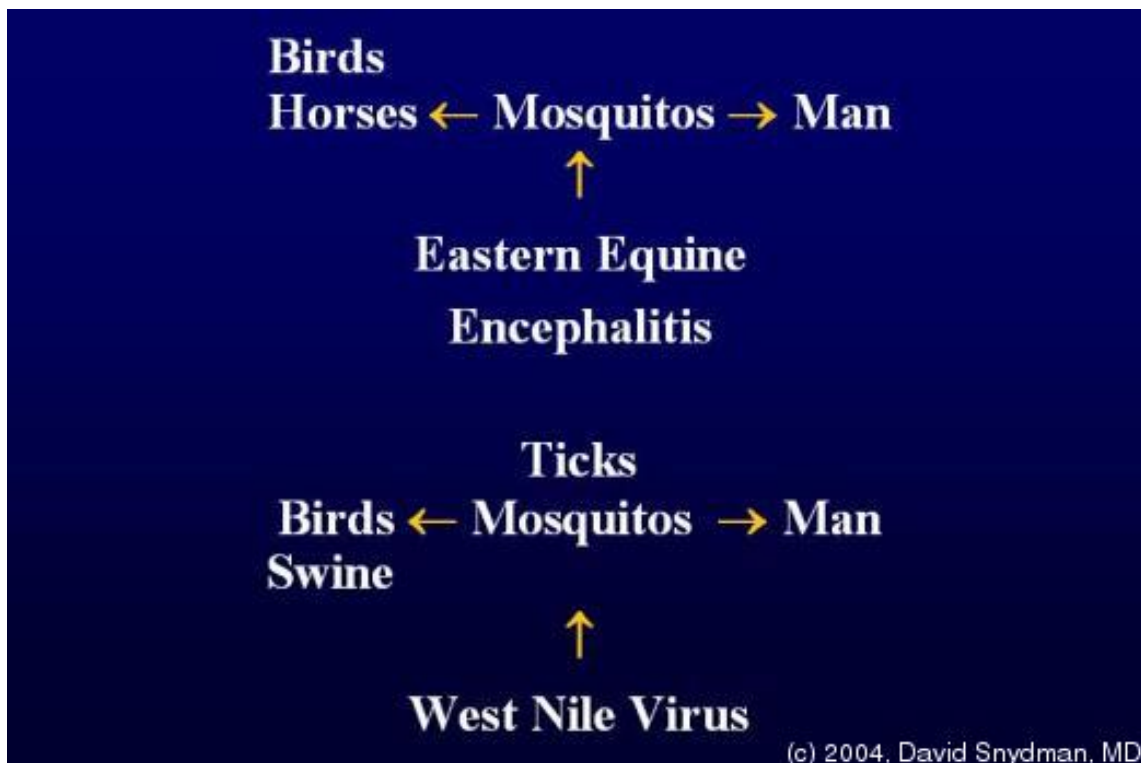
12. HSV Encephalitis Key Points

**HSV Encephalitis
Key Points**

- **Temporal Lobe Involvement**
- **Treatable with Acyclovir**
- **CSF generally with RBC and WBC**
- **Dx - CSF PCR**

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13. Case of Encephalitis



14. Eastern Equine Encephalitis (1)

Eastern Equine Encephalitis

Symptoms and Signs	
Fever	83%
Headache	75%
Nausea/Vomiting	61%
Malaise/Weakness	58%
Confusion	44%
Stiff Neck	36%
Seizures	25%

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15. Eastern Equine Encephalitis (2)

Eastern Equine Encephalitis

CSF Findings

Pleocytosis	97% (370 cells)
Protein elevated	94% (97 mg/dl)
RBC	77%

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16. Eastern Equine Encephalitis (3)

Eastern Equine Encephalitis

Prognosis

Mortality	36%
Mild Impairment	40%
Severe Impairment	15%
Moderate Impairment	8%

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17.

West Nile Virus Encephalitis

West Nile Virus Encephalitis

- RNA flavivirus (single strand)
- (St. Louis Encephalitis, Japanese Encephalitis, Dengue, Others)
- Vector - Mosquito (culex)
- Vertebrate host
 Birds

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18.

Encephalitis Key Points

Encephalitis Key Points

- Diffuse involvement of brain substance
- HSV most common fatal but only treatable form
- Arbovirus regional associations

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19.

Rabies

Rabies

- **Neurotropic lyssavirus**
- **Animal to human transmission**
- **Rare cases Iatrogenic Transmission
(corneal grafts)**

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20.

Rabies Pathogenesis (1)

Rabies Pathogenesis

- **Glycoprotein attachment to cells**
- **Peripheral nerve entry (large inoculum)**
- **Skeletal muscle amplification (small inoculum)**
- **CNS entry**
Unmyelinated sensory and motor terminals

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21.

Rabies Pathogenesis (2)

Rabies Pathogenesis

- **Spread 8-22 mm per day**
- **Spinal cord
pain
paresthesia**
- **Spread from CNS
saliva, salivary glands**

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22.

Rabies Clinical Manifestations

Rabies Clinical Manifestations

- **Irritation or paraesthesia at original lesion**
- **May present as basal encephalitis**
Fever, altered personality, periodic extreme agitation
- **Stimulation face/mouth with air/water --> spasms**
- **Paralytic Rabies - ascending paralysis**

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23.

Rabies Diagnosis Histology

**Rabies Diagnosis
Histology**

- **Negri bodies**
- **Rabies genome CSF**
- **Corneal scrapings, saliva, urine**
Skin Bx (neck)

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24.

Rabies Prevention

Rabies Prevention

- **Wash wound**
- **HRIG**
- **Rabies Vaccine**

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25. Post Infectious Syndromes (1)

Post Infectious Syndromes

- **Guillain-Barre**
- **Transverse myelitis**
- **Neuritis**

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26. Post Infectious and Vaccine Associated Encephalitis

Post Infectious and Vaccine Associated Encephalitis

Pathogenesis

- **Perivenular mononuclear inflammation**
- **Edema**
- **Demyelination**

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27. Post Infectious Syndromes (2)

Post Infectious Syndromes

Guillain-Barre

- **Ascending paralysis**
- **CSF elevated protein**
- **CSF lymphocyte or no cells**
- **Association**
 - Mycoplasma (respiratory)**
 - EBV**
 - Campylobacter (GI)**

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28. Human Prion Diseases

Human Prion Diseases

- **Jacob-Creutzfeldt**
- **Kuru**
- **Bovine Spongiform Encephalopathy**

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29. Pathogenetic Features of Prion Diseases

Pathogenetic Features of Prion Diseases

<u>Disease</u>	<u>Host</u>	<u>Mechanism of Pathogenesis</u>
Kuru	Fore people in New Guinea	Infection through ritualistic cannibalism
Creutzfeldt-Jakob disease Iatrogenic	Humans	Infection from prion-contaminated human growth hormone, dura mater grafts, and so forth
New variant	Humans	Infection from bovine prions?
Familial	Humans	Germ-line mutations in the PrP gene
Sporadic	Humans	Somatic mutation or spontaneous conversion of PrP ^c into PrP ^{Sc} ?

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30. Prions New Concepts

- ## Prions New Concepts
- Infectious pathogens devoid of DNA or RNA
 - Infectious, genetic or sporadic
 - Accumulation of PrP^{Sc}
 - Variety of conformations
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31. Prions Infectious Proteins

**Prions
Infectious Proteins**

- PrP^c conversion to PrP^{Sc} (scrapie) isoform
- Encoded chromosomal gene
- Proteolysis PrP^{Sc} to PrP
which polymerizes into amyloid

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32. New Variant Creutzfeldt-Jacob Disease

**New Variant Creutzfeldt-Jacob
Disease**

- Young adults Britain and France
- Mean onset age 26 years
- Duration of illness 14 months
- BSE like proteins

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