**Classic case:** Abnormal behavior, neuro signs, weight loss, and often *aspiration pneumonia*

**Presentation:**
- Wild or captive cervids
- Deer - White-tailed, Black-tailed, Mule, Red, Sika
- Rocky Mtn. Elk (wapiti); less susceptible than deer
- Moose - recently identified in Canada
- >16 months of age; most 2-7 yrs  
  - Older in endemic herds

**Clinical signs**
- Weight loss
- Bruxism
- Hypersalivation
- Esophageal dilation
- Regurgitation
- **Aspiration pneumonia**
- Neurologic signs  
  - Ataxia
  - Head tremor
  - Low head carriage
  - Persistent pacing
  - Episodic somnolence

**DDX:**
- Starvation
- Dental attrition
- Nutritional deficiency
- Peritonitis
- Brain abscess
- Meningitis
- Traumatic injury
- Pneumonia
- Parelaphostrongylus tenuis
- Epizootic hemorrhagic ds
- Locoweed intoxication (elk)
- Encephalitis
- Blue tongue
- Arthritis

**Test of choice:** must identify prion protein

Detection of prions in CNS (obex) or lymphoid tissues
- Screening - ELISA
- Confirmation – Immunohistochemistry  
  Western blot (in autolyzed tissue)

White-tailed deer, Mule deer
- Deer more likely to have prions in lymph tissue  
  - Always submit retropharyngeal lymph node (RLN) & CNS (Obex)
- Prion accumulates in lymph tissue of deer *before* CNS  
  - Biopsy of tonsil – *antenomortem* test, but rarely performed

Rocky Mtn. Elk - The **OBEX** from the brain, and lymphoid tissues
**Rx of choice:**
No treatment

**Prognosis:**
Grave, fatal disease

**Prevention:**

<table>
<thead>
<tr>
<th>Captive or Farmed animals:</th>
<th>Free range herds - Very difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Maintain a closed herd</td>
<td>• Vigilant surveillance</td>
</tr>
<tr>
<td>• Test all animals that die</td>
<td>▪ Test and remove positive animals</td>
</tr>
<tr>
<td>• Limit new additions to herd</td>
<td>▪ Population reduction</td>
</tr>
<tr>
<td>• Minimum 5 years of monitoring</td>
<td></td>
</tr>
<tr>
<td>• Quarantine required all positive herds; Control programs designed for each herd</td>
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<tr>
<td>• Voluntary herd certification programs offered by APHIS</td>
<td></td>
</tr>
</tbody>
</table>

**Hygiene**

- Disinfect - 50% bleach, other approved products
- Dispose of carcasses promptly
- Incineration, alkaline digestion
- Municipal landfills

**Pearls:**

**CWD is a transmissible spongiform encephalopathy (TSE)**

First identified in late 1960’s
Etiology – abnormal, ‘misfolded’ protein, called a **Prion** – **PrP**; **PrP**\textsuperscript{CWD} specific for CWD

PrP binds to normal prion proteins in cells – induces misfolding in normal PrPs
Abnormal PrP’s accumulate – cellular dysfunction

**Horizontal transmission**

- Direct contact with infected animals or contaminated environments
- Incubation time at least 16 months, usually 2-4 yrs

**Prevalence**

- Captive herds - may reach 100%
- In wild – variable, <1-30%

Hunters beware: **Cooking DOES NOT destroy PrP\textsuperscript{CWD} in tissues !!**

Test carcasses in endemic areas before consuming
CWD is a *reportable disease* in many states of the US

Prion diseases are Transmissible Spongiform Encephalopathies (TSE)

<table>
<thead>
<tr>
<th>BSE</th>
<th>Bovine</th>
<th>Mad Cow Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWD</td>
<td>Sheep/Goats</td>
<td>Chronic wasting disease</td>
</tr>
<tr>
<td>USE</td>
<td>Ungulates</td>
<td></td>
</tr>
<tr>
<td>MSE</td>
<td>Feline</td>
<td>Transmissible mink enc.</td>
</tr>
</tbody>
</table>

**Humans**

<table>
<thead>
<tr>
<th>CJD</th>
<th>Creutzfeldt-Jacob Ds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variant CJD</strong></td>
<td>BSE in people</td>
</tr>
<tr>
<td><strong>Kuru</strong></td>
<td>Ritual cannibalism by the Fore Tribe of New Guinea</td>
</tr>
</tbody>
</table>

**Refs:**

- Large Animal Neurology, Mayhew, 2nd ed. pp. 259-260
- Merck Manual, 10th ed (online): Chronic Wasting Disease
- USDA (APHIS): Chronic Wasting Disease, The Center for Food Security & Public Health and Iowa State University College Vet Med: Chronic Wasting Disease;
- ★ CWD Alliance, CWD.CC—excellent websites with information, news, and images


**My Notes:**