Three neuromuscular disorders that respond to vitamin E supplementation:

1. NAD/EDM Neuroaxonal dystrophy (NAD) and its more severe variant equine degenerative myeloencephalopathy (EDM) are diffuse degenerative diseases of the spinal cord and brain stem. They occur in a wide range of equine breeds and are thought to be genetically linked. Cases are commonly diagnosed in foals from 6 to 12 months of age. Multiple studies have shown that vitamin E supplementation provided to at-risk foals will reduce the incidence and severity of these diseases. Supplementation is most effective prior to the onset of symptoms. Vitamin E supplementation is recommended for pregnant mares, and at-risk foals for the first two years of life.

   **Level of daily natural vitamin E supplementation recommended:**
   - **Pregnant Broodmares**
     - First two trimesters: 5,000 IU/day
     - Third trimester: 10,000 IU/day
   - **Foals**
     - At birth: E-Se injection (1 ml/100 lbs)
     - First year: 5,000 IU/day
     - Second year: 2,000 IU/day
   - **Affected cases**
     - Any age: 5,000 IU/Day

2. VEM Vitamin E-deficient myopathy (VEM) is diagnosed in horses with alpha-tocopherol deficiency. VEM-affected horses develop symptoms only related to muscle weakness and atrophy. In VEM cases there is no direct evidence of motor nerve damage. This disorder has been noted in a wide variety of breeds. VEM horses respond very well to supplementation with natural vitamin E.

   **Level of daily natural vitamin E supplementation recommended:**
   - **Affected horses**
     - 5,000 to 7,000 IU/day
   - **Healthy horses to ensure adequate vitamin E levels are maintained**
     - Maintenance (some access to fresh green grass): 1,000 IU/day
     - Stalled or on poor pasture: 2,000 IU/day
     - In training or competing: 3,000 to 5,000 IU/day, depending on level of exercise

Natural Vitamin E and Neuromuscular Disorders
Natural vitamin E is an essential nutrient missing from many equine diets

Vitamin E is a powerful antioxidant that limits the damage caused by oxidative stress and the actions of free radicals. It plays an integral role in maintaining healthy muscle and nerve functions. Vitamin E cannot be synthesized by the horse; therefore, it is considered an essential nutrient. The best source of vitamin E is fresh green grass; however, the potency of vitamin E declines very quickly once forages are harvested and dried. Multiple research studies have shown that vitamin E is often deficient in the diets of horses that do not have access to continual grazing on fresh green grass, or those grazing on winter pasture.

Horses suffering from neurological disease, metabolically challenged horses, or compromised horses of any age can be exposed to increased levels of oxidative stress and therefore require additional vitamin E supplementation. In cases of acute illness it may become imperative to raise circulating vitamin E levels very quickly.

Three neuromuscular disorders that respond to vitamin E supplementation:

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3. EMND Equine motor neuron disease (EMND) is an oxidative disorder of the somatic motor neuron system and has been linked to vitamin E deficiency in horses. Horses that are unable to graze on substantial amounts of fresh grass for 18 months or more are at high risk.

Level of daily natural vitamin E supplementation recommended:

**Affected horses**
- 5,000 to 7,000 IU/day

**Healthy horses to ensure adequate vitamin E levels are maintained**
- Maintenance (some access to fresh green grass): 1,000 IU/day
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- In training or competing: 3,000 to 5,000 IU/day, depending on level of exercise

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**Choosing the Right Vitamin E**

**Source matters: synthetic versus natural vitamin E**
Vitamin E is the most powerful antioxidant in the equine diet. But not all forms of the vitamin are created equally. Many supplements and most feeds contain synthetic vitamin E (dl-alpha-tocopherol acetate), which is petroleum-based and not as bioavailable as natural plant-based vitamin E (d-alpha-tocopherol). Compared with synthetic vitamin E, the body can more efficiently transport and deliver natural vitamin E to targeted tissues. Current research in several species, including horses, shows that natural vitamin E is two to three times more potent than synthetic.

**When to choose Elevate® W.S. liquid versus Elevate® Concentrate powder:**
All of the products in the Elevate family contain high-quality natural vitamin E; however, their molecular structures differ, which affects the speed in which they are absorbed.

When it is necessary to raise vitamin E levels quickly, Elevate W.S. liquid is the product to choose. The natural vitamin E in Elevate W.S. has undergone state-of-the-art processing that converts it to a water-soluble molecule, which is absorbed more efficiently. When administered, Elevate W.S. will start raising circulating serum tocopherol levels within 24 hours and significantly increase levels within 72 hours. Elevate W.S. vitamin E is effective in crossing the blood-brain barrier, which makes it helpful in the management of neurologically challenged horses.

**For long-term supplementation and/or after a course of Elevate W.S. has been administered, Elevate Concentrate powder is recommended.**
Elevate Concentrate powder provides a highly bioavailable source of d-alpha tocopherol acetate that works to raise serum tocopherol levels steadily over several weeks. Elevate Concentrate offers an easy and affordable way to meet a horse’s essential vitamin E needs. Elevate Concentrate does not contain other vitamins or minerals. Horse owners can safely adjust the amount fed to support horses with high vitamin E requirements without worrying about causing imbalances.

**Transitioning from Elevate W.S. liquid to Elevate Concentrate powder:**
When transitioning from Elevate W.S. liquid to Elevate Concentrate powder, the key to keeping vitamin E levels constant is to make the change slowly over several weeks. Because of its different molecular structure, Elevate Concentrate takes a longer period of time, about 3 to 4 weeks, to increase serum tocopherol levels. Continuing to support a horse with Elevate W.S. during the transition to Elevate Concentrate powder ensures serum tocopherol remains at the desired level.

**Transition Recommendations:**
During the first week of the transition, administer the full amount of Elevate W.S. and slowly increase the level of Concentrate offered to about 50% of the desired dose. In the second week, slowly decrease the amount of Elevate W.S. offered by about 25% while continuing to increase the amount of Elevate Concentrate offered until 100% of the desired dose is attained. During the third and fourth weeks, continue offering the full dose of Elevate Concentrate and slowly decrease the amount of Elevate W.S. until the transition is complete.

**Common Sources of Vitamin E**

<table>
<thead>
<tr>
<th>Source</th>
<th>Biopotency (IU/MG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>dl-alpha-tocopherol acetate (synthetic)</td>
<td>1.00</td>
</tr>
<tr>
<td>d-alpha-tocopherol acetate (natural, Elevate Concentrate)</td>
<td>1.36</td>
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<tr>
<td>dl-alpha-tocopherol (synthetic)</td>
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<tr>
<td>d-alpha-tocopherol (natural, Elevate W.S.)</td>
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<tr>
<td>dl-alpha-tocopherol acid succinate (synthetic)</td>
<td>0.89</td>
</tr>
<tr>
<td>d-alpha-tocopherol acid succinate (natural)</td>
<td>1.21</td>
</tr>
</tbody>
</table>