**LETTER OF MEDICAL NECESSITY: PDCD**

**Date:**

**Patient:**

**D.O.B:**

**Policy Number:**

Attention Case Manager:

This letter of medical necessity is regarding the nutrition management of **[PATIENT NAME]**. This patientis a **[AGE] [GENDER]** with a diagnosis **Pyruvate Dehydrogenase Deficiency or Pyruvate Dehydrogenase Complex Deficiency (PDCD) (ICD 10: E74.4)**.PDCD is one of the most common neurodegenerative disease of mitochondrial metabolism. PDCD is classified as an inborn error of metabolism (IEM), but currently there is not a test to identify it with newborn screening.

There are 2 major presentations of PDH deficiency, metabolic and neurologic, which occur at equal frequency. The metabolic form presents as severe lactic acidosis in the newborn period, usually leading to death. Patients with the neurologic presentation are hypotonic and lethargic, develop seizures, mental retardation, and spasticity. They often have structural abnormalities in the central nervous system with minimal or absent metabolic abnormalities. Between these two extremes, there is a continuous spectrum of intermediate forms characterized by intermittent episodes of lactic acidosis associated with cerebellar ataxia.

The ketogenic diet is a high fat, adequate protein, low carbohydrate treatment that is individually calculated and prescribed to produce adequate ketosis to avoid build-up of lactic acid and worsening of symptoms. The evidence for utilizing ketogenic treatment for the management of PDCD is well documented (see clinical references in Appendix A).

Ketogenic therapy severely restricts the intake of dairy products, fruit, vegetables, cereals and grains. As such, the potential for nutrient deficiency is a significant risk. KetoVie 4:1 is a medical food specifically designed to provide the necessary nutrients to support ketogenic diet therapy. Nutrient deficiencies such as carnitine, selenium, calcium, vitamin D and protein, are common with ketogenic therapies. In order to help prevent these deficiencies, KetoVie provides 50mg carnitine, 22mcg selenium, 260mg calcium, 250IU vitamin D and 8.5g protein per 250mL serving, with a 4:1 (fat to carbohydrate and protein) ketogenic ratio. This ratio is effective in achieving the desired level of ketosis which can provide alternative fuel in the presence of metabolic derangements seen in PDCD. KetoVie 4:1 additionally contains medium chain triglycerides (MCTs) which aid in reaching the desired level of ketosis for maximum benefit. KetoVie can be offered orally to support optimal levels of ketosis or as a sole source tube feeding.

The term medical food/formula, is defined in section 5(b) of the Orphan Drug Act {21 U.S.C. 360ee (b) (3)}: a “food which is formulated to be consumed or administered enterally under the supervision of a physician and which is intended for the specific dietary management of a disease or condition for which distinctive nutritional requirements, based on recognized scientific principles, are established by medical evaluation.”

In order to meet **[PATIENT NAME]** nutritional needs, he/she will require **[# OF CALORIES**] calories per day from KetoVie 4:1 medical food (see monthly volume prescription chart below for corresponding amount of product). KetoVie 4:1 is only available by prescription through a pharmacy, durable medical equipment (DME) company or directly from the manufacturer Cambrooke Therapeutics, Inc.

We are requesting that, because ketogenic treatment comprises the primary treatment for the individual suffering from PDCD, the KetoVie 4:1 prescribed for **[PATIENT NAME]** be covered under your policies similar to other inborn errors of metabolism. If correction of lactic acidosis and minimizing recurrent acute episodes of metabolic decompensation can be achieved with a ketogenic treatment, more costly and invasive treatments and level of care may be avoided.

We appreciate your attention to this request for **[PATIENT NAME]** medical food/formula, **KetoVie 4:1**, to be covered by their current medical insurance. Please do not hesitate to contact us if you have any questions.

Sincerely,

**[Physician name, M.D. other credentials, contact info, clinic name]**

**[Dietitian name, RD, LDN other credentials Center/Hospital/Institution/Practice]**

Cc: **[Parents’ names] and Medical Records**

Attachments: Prescription, Medical Records, Growth Records (if indicated), and Clinical References for PDCD and the Ketogenic Diet

**Monthly Volume Prescription:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Calories/day** | **Calories/month** | **Tetras of KetoVie/month** | **Cases/month** |
| **Vanilla** |
| 360 or less | 10,800 | 30 | 1 |
| 361 - 720 | 21,600 | 60 | 2 |
| 721 – 1,080 | 32,400 | 90 | 3 |
| 1,081 – 1,440 | 43,200 | 120 | 4 |
| 1,441 – 1,800 | 54,000 | 150 | 5 |
| **Chocolate** |
| 390 or less | 11,700 | 30 | 1 |
| 391 - 780 | 23,400 | 60 | 2 |
| 781 - 1,170 | 35,100 | 90 | 3 |
| 1,171 - 1,560 | 46,800 | 120 | 4 |
| 1,561 - 1,950 | 58,500 | 150 | 5 |

**Appendix A: References**

1. Sofou, K., Dahlin, M., Hallböök, T., Lindefeldt, M., Viggedal, G., & Darin, N. (2017). Ketogenic diet in pyruvate dehydrogenase complex deficiency: short- and long-term outcomes. Journal of Inherited Metabolic Disease, 40(2), 237–245.
2. Patel, K. P., O’Brien, T. W., Subramony, S. H., Shuster, J., & Stacpoole, P. W. (2012). The Spectrum of Pyruvate Dehydrogenase Complex Deficiency: Clinical, Biochemical and Genetic Features in 371 Patients. Molecular Genetics and Metabolism, 105(1), 34–43.
3. El-Gharbawy, A.H., Boney, A., Young, S.P., & Kishnani, P.S. (2011). Follow-up of a child with pyruvate dehydrogenase deficiency on a less restrictive ketogenic diet. Molecular Genetics and Metabolism, 102(2), 214 – 215.
4. Frye, R.E. (2010) Pyruvate dehydrogenase complex deficiency. National Organization for Rare Disorders. Retrieved 5/2/2017 from https://rarediseases.org/rare-diseases/pyruvate-dehydrogenase-complex-deficiency/.
5. Rogovik, A. L., & Goldman, R. D. (2010). Ketogenic diet for treatment of epilepsy. Canadian Family Physician, 56(6), 540–542.
6. Wexler, I.D., Hemalatha, S.G., McConnell, J., Bruist, N.R., Dahl, H.H., Berry, S.A., et al. (1997) Outcomes of pyruvate dehydrogenase deficiency treated with ketogenic diets. Studies in patients with identical mutations. Neurology, 49(6):1655-61.
7. Brown, G. K., Otero, L. J., LeGris, M., Brown, R. M. (1994) Pyruvate dehydrogenase deficiency. J. Med. Genet. 31: 875-879.
8. Falk, R. E., Cederbaum, S. D., Blass, J. P., Gibson, G. E., Kark, R. A. P., Carrel, R. E. (1976) Ketogenic diet in the management of pyruvate dehydrogenase deficiency. Pediatrics 58: 713-721.