

Chyle Leak Guidelines

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<p>General</p>	<ul style="list-style-type: none"> • The lymph system is comprised of the thoracic duct, lymph vessels, capillaries and nodes, the spleen, thymus, bone marrow, and GALT tissue. • Lymph system functions include: <ul style="list-style-type: none"> ○ Transportation of long chain fatty acids (LCFA) and fat-soluble vitamins ○ Regulation of interstitial fluid ○ Immunological functions. • Lymph has two main components: white blood cells and chyle from the GI tract (which is made up primarily of fat, protein, electrolytes, and lymphocytes). • Chyle leaks can occur in different spots, but most commonly occur in the thoracic cavity, which is also known as a chylothorax or chylous effusion. • The cause can be primary (from lymphangiectasia which is a condition that causes dilation of lymph vessels) or secondary (from surgery, malignancies, or trauma). • Chyle leak treatment options: drainage, medication, surgery and/or dietary modifications that include a fat-free or low-fat oral diet, enteral and/or parenteral nutrition support. <p>There are three main goals of nutrition management for a chylothorax:</p> <ol style="list-style-type: none"> 1. Decrease production of chyle to promote closure of the leak 2. Replenish fluids and micronutrients 3. Prevent malnutrition
<p>Diet Intervention</p>	<p>A dietary approach to close chyle leaks can be very effective with up to 80% closing after nutrition interventions. Currently there is no consensus on which feeding route is optimal: oral, enteral or parenteral. The appropriate feeding route is dependent on the severity of the chyle leak (measured by daily output). For < 500 mL/day of output, oral or enteral feedings may be indicated, while parenteral nutrition may be indicated when output is >1000 mL/day.</p> <p>Oral nutrition - Indicated when patients are willing to adhere to a fat-free/low-fat diet, can take in large volumes to meet their calorie needs and were not already high nutrition risk.</p> <ul style="list-style-type: none"> • Adequate amounts fat-free or low-fat protein needs to be included. Source of fat-free protein include: egg beaters, fat-free dairy, non-fat dry milk powder, and Beneprotein®. • Medium chain triglycerides (MCT) are frequently used in the treatment of chyle leaks as they by-pass the lymph system, still allowing the leak to heal. MCT can cause GI distress, however, for most individuals 4-6 tablespoons spread throughout the day is generally tolerated. • Fat-soluble vitamins and essential fatty acids (EFA) will need to be supplemented. • A nocturnal of a low-fat or fat-free enteral formula may be appropriate to supplements PO intake feeding.
<p>Nutrition Support</p>	<p>Enteral nutrition - Indicated when patients are non-compliant with oral dietary restrictions or are not able to meet nutrient needs via PO intake alone.</p> <ul style="list-style-type: none"> • Enteral formulas low in fat and with a high MCT:LCT ratio would be indicated. Examples of these formulas include Portagen®, Nutren 2.0®, or Peptamen®. <p>Parenteral nutrition - Indicated when oral and/or enteral nutrition interventions have not closed the leak.</p> <ul style="list-style-type: none"> • Lipids can be included with TPN as they are absorbed directly into the bloodstream by-passing the lymph system.

Assessment	<p>It can be difficult to diagnose a chyle leak, but one sign includes white or milky drainage through a chest tube. This indicates the presence of lymphocytes. Chyle can range in color from clear (if there has been no fat intake) to red (if blood cells are also present).</p> <p>If a chyle leak is suspected, the fluid that is being lost or drained can be analyzed. Indications of a chyle leak include >100 mg/dl of triglycerides, >4% chylomicrons or >50% lymphocytes.</p>
Energy and macronutrients	<p>1 liter of chyle contains approximately:</p> <ul style="list-style-type: none"> ○ 200 kcals ○ 20-30 g of protein ○ 5-30 g fat <p>The calories, protein and fat lost through chyle leaks should be taken into account when calculating energy needs, especially with cases of high chyle output.</p>
Essential Fatty Acids (EFA)	<ul style="list-style-type: none"> • Essential fatty acids (EFA) include linoleic acid and α-linolenic acid. • Dietary interventions to close a chyle leak can lead to EFA deficiency. • Signs of deficiency include eczema and poor wound healing and can begin in as little as 2-4 weeks. • MCT oil does not contain EFA, and therefore patients will need to be supplemented with 2-5% of calories coming from EFA. A potential source includes canola oil.
Fluids	<p>Patients with chyle leaks are at increased risk for hypovolemia due to fluid losses. Fluid balance should be tightly maintained to prevent dehydration, but trying inhibit increased lymph flow that can occur from taking in extra water.</p>
Micronutrients	<p>Fat-soluble vitamins A, E, D, and K may need to be supplemented, ideally in the form of water-soluble supplements.</p> <p>Electrolytes such as Na, K, and Cl may be low due to losses in chyle output.</p>
Labs	<ul style="list-style-type: none"> • Electrolyte losses: Na, K, Cl • Nutritional status: total protein and albumin • Fat soluble vitamins: A, D, E, and K
Medications	<p>Octreotide is often used in conjunction with dietary treatment to accelerate healing.</p>

References

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