



Canadian Celiac Association  
 5025 Orbitor Dr., Bldg 1 - Suite 400  
 Mississauga, ON, L4W 4Y5  
 1-905-507-6208

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## Nutrition Complications for Celiac Disease

| Nutritional Consideration | Comments   | Counselling Suggestions   |
|---------------------------|--|---|
| Iron Deficiency Anemia    | <ul style="list-style-type: none"> <li>• Iron deficiency anemia is common with celiac disease.</li> <li>• In the 2007 Canadian Celiac Health Survey, 49% of respondents reported that they had been diagnosed with iron deficiency anemia prior to the diagnosis of celiac disease (1).</li> <li>• Celiac disease should be considered in the differential diagnosis of unexplained iron deficiency anemia (4).</li> <li>• Iron deficiency will persist until gut morphology is restored and iron stores are replenished (5-7).</li> <li>• Long-term follow-up of serum ferritin in clients with celiac disease is helpful to determine if iron deficiency has resolved completely (8).</li> </ul> | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet, with special attention to iron rich foods should correct iron deficiency.</li> <li>• Optimize dietary sources of iron with:             <ul style="list-style-type: none"> <li>• <b>Heme iron sources:</b> meat, fish, poultry.</li> <li>• <b>Non-heme iron sources:</b> nuts, seeds, legumes, dark green vegetables dried fruits (apricots, prunes, raisins), eggs, amaranth, bean flours, quinoa, rice bran, soy flour, black-strap molasses, teff.</li> </ul> </li> <li>• Combine non-heme iron sources with foods high in vitamin C to facilitate absorption – oranges, tangerines, tomatoes, bell peppers etc.</li> <li>• Short term gluten-free iron supplementation may be required in some clients (it is essential to recognize that iron supplements can cause side effects which include stomach discomfort and constipation).</li> </ul> |
| Lactose Intolerance       | <ul style="list-style-type: none"> <li>• Lactose intolerance may occur temporarily in newly diagnosed patients as a result of damaged villi and decreased lactase production.</li> <li>• In the Canadian Celiac Health Survey, 26% of respondents reported it as symptom prior to diagnosis (1).</li> <li>• With a strict gluten-free diet, lactose intolerance symptoms should disappear within 6 months to one year (with the healing of the small intestine). If lactose intolerance persists, consider the possibility of primary lactose intolerance or hidden gluten in the diet.</li> </ul>   | <ul style="list-style-type: none"> <li>• Start with a strict gluten-free diet and if symptoms persist, a temporary restriction of dietary lactose may be necessary (in addition to the gluten-free diet).</li> <li>• If a lactose-free diet is required consider:             <ul style="list-style-type: none"> <li>○ Lactase enzyme drops or tablets as tolerated</li> <li>○ Lactose-free (and gluten-free) beverages fortified with calcium, vitamin D and other nutrients</li> </ul> </li> <li>• Once a client is asymptomatic, re-introduce lactose in small amounts to assess tolerance.</li> </ul>   |

Adapted from: Case S, Kaplan CR. Gluten-Free Guidance: Practical Tips for Dietitians and their Celiac Patients. *Today's Dietitian*. March 2003: 44-49.:



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| Osteopenia or Osteoporosis | <ul style="list-style-type: none"> <li>• Early bone disease is common in both men and women with celiac disease due to malabsorption. In the Canadian Celiac Health Survey 9 % of respondents reported osteopenia and 26 % reported osteoporosis (1).</li> <li>• The high prevalence of osteoporosis in celiac disease warrants a Bone Mineral Density (BMD) be ordered at the time of diagnosis (9).</li> <li>• Vitamin D deficiency, which is common in celiac disease, needs to be treated to maintain serum 25-dihydroxyvitamin D levels in the target range (9).</li> <li>• Osteoporosis may persist even with strict adherence to the gluten-free diet (10-12).</li> <li>• A North American study found that osteoporosis and low BMD affected adults with celiac disease whether or not they followed a gluten-free diet (13).</li> <li>• Adult celiac patients on a gluten-free diet with adequate calcium intake for four years had reduced fractional calcium absorption and BMD compared with control subjects despite the remission in their clinical symptoms (14).</li> </ul> | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet, with special attention to calcium and Vitamin D rich foods.</li> <li>• <b>Calcium rich sources:</b> milk, cheese, yogurt, gluten-free calcium fortified beverages (orange juice, gluten-free rice milk/ soy milk), broccoli, kale, turnip, mustard greens, bok choy, almonds, teff.</li> <li>• <b>Vitamin D rich sources:</b> milk, fatty fish (sardines, salmon, herring), fish oil, gluten-free vitamin D enriched beverages (soy, rice, orange juice), teff.</li> <li>• Gluten-free supplementation of vitamin D and calcium may be required with inadequate dietary intake.</li> <li>• Consider recommending yearly bone density as part of regular follow-up.</li> <li>• Encourage regular physical activity, with concentration on weight bearing exercises.</li> </ul> |
| Folate Deficiency          | <ul style="list-style-type: none"> <li>• Folate deficiency may occur in severe cases of malabsorption.</li> <li>• It is important to assess folate intake and adherence to the gluten-free diet in women with celiac disease who are planning a pregnancy or who are pregnant.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet, with special attention to folate rich foods.</li> <li>• <b>Folate rich sources:</b> legumes, green leafy vegetables, broccoli, asparagus, orange juice, liver, peanuts, walnuts, sesame seeds, sunflower seeds, bean flour, amaranth, flax.</li> <li>• Recommend enriched and whole grain gluten-free foods.</li> <li>• Gluten-free supplementation of folate is required in pregnancy. It may also be required with inadequate dietary intake.</li> </ul>  |

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| Vitamin B <sub>12</sub> Deficiency | <ul style="list-style-type: none"> <li>• Although celiac disease predominately affects the proximal bowel, vitamin B<sub>12</sub> deficiency can occur in severe cases of malabsorption. Vitamin B<sub>12</sub> nutritional status should be assessed before administering any therapies that provide additional folate / folic acid.</li> <li>• Deficiency should normalize with strict adherence to a gluten-free diet.</li> </ul> | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet, with special attention to Vitamin B<sub>12</sub> rich foods.</li> <li>• <b>B<sub>12</sub> rich sources:</b> liver, eggs, milk, meat, poultry, fish, seafood.</li> <li>• Gluten-free supplementation of B<sub>12</sub> may be required with inadequate dietary intake and strict vegan diet.</li> </ul>   |
| Diarrhea                           | <ul style="list-style-type: none"> <li>• In the Canadian Celiac Health Survey, 76% of respondents reported diarrhea as a symptom prior to diagnosis.</li> <li>• Potential causes: 1) damaged villi; 2) malabsorption; 3) lactose intolerance.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet.</li> <li>• Ensure adequate fluid and electrolyte intake.</li> <li>• Limit high simple sugar sources.</li> <li>• May need to limit gassy vegetables.</li> <li>• Lactose restriction may be beneficial in patients who have lactose intolerance (should be challenged at a later date to see if this has resolved).</li> </ul>   |
| Constipation                       | <ul style="list-style-type: none"> <li>• In the Canadian Celiac Health Survey 32 % of respondents reported constipation as a symptom prior to diagnosis.</li> <li>• The gluten-free diet tends to be low in fibre; constipation may develop once the diet has been initiated.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet, with special attention to fibre containing foods.</li> <li>• Ensure adequate fluid intake.</li> <li>• Gradually increase dietary fibre to minimize adverse gastrointestinal side effects.</li> <li>• <b>Sources of dietary fibre:</b> fruits, vegetables, raisins, nuts and seeds, legumes and beans, bean flours, flax, brown/rice/wild rice, corn bran, quinoa, amaranth, pure uncontaminated oats, teff.</li> </ul> |

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| Growth Failure in Children            | <ul style="list-style-type: none"> <li>• In a recent Canadian Survey, 70% of children had poor growth and 18% had short stature prior to diagnosis.</li> <li>• Growth problems may occur when undiagnosed celiac disease interferes with nutrient absorption.</li> <li>• If children are diagnosed and treated early enough, catch-up growth is possible.</li> <li>• In rare cases of severe malabsorption and / or weight loss, children may benefit from supplemental nutrition (oral or enteral).</li> </ul> | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet.</li> <li>• Aim for the achievement of appropriate weight for height.</li> <li>• Encourage intake of high calorie foods to promote growth and / or weight gain.</li> </ul>  |
| Calorie/Protein Deficiency            | <ul style="list-style-type: none"> <li>• Potential causes: 1) poor intake secondary to gastrointestinal symptoms (e.g. poor appetite, vomiting, diarrhea); 2) malabsorption.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet.</li> <li>• Consider energy and/or protein boosting.</li> </ul>   |
| Calorie Excess and Overweight/Obesity | <ul style="list-style-type: none"> <li>• Gluten-free prepared foods tend to be higher in fat, carbohydrates and calories and lower in fibre.</li> <li>• As the intestine heals, there is increased absorption of macronutrients.</li> <li>• Patients with celiac disease are at risk of becoming overweight.</li> </ul>   | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet.</li> <li>• Encourage general healthy eating.</li> <li>• Choose lower fat, high fibre (e.g., whole grain) gluten-free food alternatives when available.</li> <li>• Encourage appropriate serving sizes (according to Canada's Food Guide).</li> <li>• Encourage regular physical activity.</li> </ul> |
| Vitamin deficiencies                  | <ul style="list-style-type: none"> <li>• If patients with a history of steatorrhea and diarrhea, vitamin deficiencies may occur.</li> <li>• Bruising and / or hemorrhaging may be an indication of Vitamin K malabsorption.</li> </ul>  | <ul style="list-style-type: none"> <li>• Treatment with a strict gluten-free diet.</li> <li>• Encourage enriched and whole grain gluten-free products.</li> <li>• Gluten-free multi-vitamin mineral supplements may be required with inadequate dietary intake.</li> </ul>  |

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