NEUROENDOCRINE TUMOURS, CARCINOID SYNDROME AND DIET

If you have been diagnosed with a neuroendocrine tumour or carcinoid syndrome, you may be experiencing symptoms like:

- Flushing (redness of the skin)
- Diarrhea
- Gas
- Bloating (feeling overly full and uncomfortable in your stomach area)
- Abdominal/stomach pain

The following foods and/or eating habits are often triggers and may make these symptoms worse:

- Large meals
- High fat meals
- Alcohol
- Spicy foods
- Raw tomatoes
- Foods containing moderate or high amounts of amines (please see the list on page # 3)

Everyone is unique and you may be able to tolerate nearly all or very few of the trigger foods.

**TIP:** Keeping a food and symptom diary may be helpful. Record your daily food and drink intake and any symptoms that you experience. You may start to notice a pattern.
WHAT CAN I EAT?

If you are not having any symptoms, follow healthy eating guidelines.

If you have symptoms, you should follow the suggestions below. Remember, you only need to avoid foods that bother you.

GENERAL GUIDELINES

- Eat 4 to 6 small meals daily, instead of 3 large meals
- Choose a diet high in protein. Include meat and alternatives such as nuts, beans, lentils and legumes at each meal and snack
- Follow a low fat diet

<table>
<thead>
<tr>
<th>Choose</th>
<th>Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Omega-3 &amp; omega-9 fatty acids:</td>
<td>• Greasy, fried foods</td>
</tr>
<tr>
<td>o Almonds, olive oil, avocados, canola</td>
<td>• Limit animal fats (butter, cheese, chicken</td>
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<td>oil, extra virgin olive oil</td>
<td>skin)</td>
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<tr>
<td>o Fatty fish, flax seed meal, walnuts,</td>
<td>• Avoid trans-fats (aka partially hydrogenated</td>
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<td>pumpkin seeds</td>
<td>oils)</td>
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- Vegetables
  - Eat cooked vegetables to help you digest.
  - Avoid raw tomatoes

- Avoid foods containing moderate or high amounts of amines
# AMINE CONTAINING FOODS

<table>
<thead>
<tr>
<th>Avoid</th>
<th>Choose Less Often</th>
<th>Choose Often</th>
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<tbody>
<tr>
<td><strong>Aged cheeses</strong>—cheddar, stilton, camembert, etc.</td>
<td><strong>Caffeine</strong>—coffee, cola</td>
<td><strong>Fresh lean meats</strong>, fresh poultry (turkey or chicken), fresh fish</td>
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<td><strong>Alcohol</strong>—all types</td>
<td><strong>Dark chocolate</strong>, milk chocolate, cocoa powder</td>
<td><strong>Most vegetables</strong>—but cooked may be better for you than raw</td>
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<td><strong>Smoked</strong>, salted, cured, aged, fermented, marinated or pickled fish and meats (eg. Smoked salmon, pickled herring, meat extracts, livers, salami, pepperoni, corned beef)</td>
<td><strong>Peanuts</strong>, brazil nuts, coconut</td>
<td><strong>Fruit</strong> in moderate amounts—but avoid banana, avocado, raspberries</td>
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<td><strong>Yeast extracts</strong> and “hydrolyzed” proteins: marmite/vegemite; yeasts used for flavouring processed foods; brewer’s yeast; and nutritional yeast</td>
<td><strong>Avocado</strong>, banana, raspberries</td>
<td><strong>Grain foods</strong>, starchy foods—lower fiber or soft cooked grains may be best tolerated</td>
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<tr>
<td><strong>Fermented foods</strong>—tofu, miso, sauerkraut, shrimp paste, fish sauce, soy sauce</td>
<td><strong>Soyfoods</strong>—tempeh</td>
<td><strong>Un-aged cheeses and dairy</strong>—low fat cottage cheese, ricotta cheese, mozzarella cheese; low fat yogurt or kefir; low fat cream cheese; low fat milk or low fat lactose-free milk</td>
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<tr>
<td><strong>Broad beans</strong></td>
<td><strong>Fava beans</strong></td>
<td><strong>Fresh soyfoods</strong>—soymilk, edamame</td>
</tr>
<tr>
<td><strong>Spoiled</strong> or over ripe foods</td>
<td>Certain vegetarian meat substitutes—check the label for ingredients</td>
<td></td>
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*Please note that amines do not influence tumour growth.*
**NIACIN**

Carcinoid syndrome can happen from low levels of tryptophan.

Niacin is a vitamin that is made from tryptophan.

Niacin deficiency can happen from:

- Low levels of tryptophan;
- Low food intake;
- Weight loss;
- Excess serotonin secretion from tumors.

To prevent niacin deficiency, **include** in your diet:
- **Protein-rich foods** at every meal and snack: meat, poultry, fish, eggs, milk, peanut butter, beans, lentils, tofu;
- Grain products: breads and cereals.

Your doctor may also prescribe a niacin supplement.
TIPS TO MINIMIZE DIARRHEA

- Eat smaller, more frequent meals and snacks throughout the day.

- Drink plenty of non-carbonated (no bubbles or fizz), caffeine free drinks such as water, diluted juice, sports drinks, and clear broth.

- Limit greasy, fried, spicy, or very sweet foods.

- Avoid simple sugars such as sweets/desserts, fruit juices and sodas: add water to juice to make less sweet.

- Limit or avoid stimulants such as alcohol and caffeine.

- Include binding foods: applesauce, bananas, tapioca, barley, oats, white rice, noodles, peanut butter, baked potato without the skin.

- Avoid foods that are natural laxatives, such as prunes, prune juice, rhubarb, and papaya.

- Rehydration solutions can be used to keep you hydrated:
  - Gatorade base: 2 cups Gatorade, 2 cups water, and ½ teaspoon salt;
  - Juice base: ½ cup juice, 3 ½ cups water, and ½ teaspoon salt.
HELPFUL RESOURCES

- Canadian Cancer Society (www.cancer.ca)
- BC Cancer Agency (www.bccancer.bc.ca)
- Carcinoid Cancer Foundation (http://www.carcinoid.org)
- Eat Right Ontario (www.eatrightontario.ca or 1-877-510-5102)

Please contact: ________________________, RD for any questions at 416-480-6100 Ext._________

Odette Cancer Centre patients are welcome to drop by the Nutrition Resource Centre (T wing, Ground Floor) or call (416) 480-5000 ext. 3438

Adapted from:
Cancer Care Ontario (2016). How to Manage your Diarrhea.