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 oil, extra virgin olive oil</td>
<td>Limit animal fats (butter, cheese, chicken skin)</td>
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<tr>
<td>o Fatty fish, flax seed meal, walnuts, pumpkin seeds</td>
<td>Avoid trans-fats (aka partially hydrogenated 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>Caffeine—coffee, cola</td>
<td>Fresh lean meats, fresh poultry (turkey or chicken), fresh fish</td>
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<tr>
<td><strong>Alcohol</strong>—all types</td>
<td>Dark chocolate, milk chocolate, cocoa powder</td>
<td>Most vegetables—but cooked may be better for you than raw</td>
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<tr>
<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>Peanuts, brazil nuts, coconut</td>
<td>Fruit in moderate amounts—but avoid banana, avocado, raspberries</td>
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<tr>
<td><strong>Yeast extracts</strong> and “hydrolyzed” proteins: marmite/vegemite; yeasts used for flavouring processed foods; brewer’s yeast; and nutritional yeast</td>
<td>Avocado, banana, raspberries</td>
<td>Grain foods, 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>Soyfoods—tempeh</td>
<td>Un-aged cheeses and dairy—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>
</tr>
<tr>
<td><strong>Broad beans</strong></td>
<td>Fava beans</td>
<td>Fresh soyfoods—soymilk, edamame</td>
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<tr>
<td><strong>Spoiled</strong> or over ripe foods</td>
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</tbody>
</table>

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.