

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**

Choose	Avoid
<ul style="list-style-type: none">• Omega-3 & omega-9 fatty acids:<ul style="list-style-type: none">◦ Almonds, olive oil, avocados, canola oil, extra virgin olive oil◦ Fatty fish, flax seed meal, walnuts, pumpkin seeds	<ul style="list-style-type: none">• Greasy, fried foods• Limit animal fats (butter, cheese, chicken skin)• Avoid trans-fats (aka partially hydrogenated oils)

- **Vegetables**
 - Eat cooked vegetables to help you digest.
 - Avoid raw tomatoes
- Avoid foods containing moderate or **high amounts of amines** Dietary **amines** come from protein breakdown in **foods**. Levels increase in protein **foods** (meat, fish, cheese) as they age or mature, and in **fruits** as they ripen (e.g. bananas, tomatoes).

AMINE CONTAINING FOODS

Avoid	Choose Less Often	Choose Often
<p>Aged cheeses—cheddar, stilton, camembert, etc.</p> <p>Alcohol—all types</p> <p>Smoked, salted, cured, aged, fermented, marinated or pickled fish and meats (eg. Smoked salmon, pickled herring, meat extracts, livers, salami, pepperoni, corned beef)</p> <p>Yeast extracts and “hydrolyzed” proteins: marmite/vegemite; yeasts used for flavouring processed foods; brewer’s yeast; and nutritional yeast</p> <p>Fermented foods—tofu, miso, sauerkraut, shrimp paste, fish sauce, soy sauce</p> <p>Broad beans</p> <p>Spoiled or over ripe foods</p>	<p>Caffeine—coffee, cola</p> <p>Dark chocolate, milk chocolate, cocoa powder</p> <p>Peanuts, brazil nuts, coconut</p> <p>Avocado, banana, raspberries</p> <p>Soyfoods—tempeh</p> <p>Fava beans</p> <p>Certain vegetarian meat substitutes—check the label for ingredients</p>	<p>Fresh lean meats, fresh poultry (turkey or chicken), fresh fish</p> <p>Most vegetables—but cooked may be better for you than raw</p> <p>Fruit in moderate amounts—but avoid banana, avocado, raspberries</p> <p>Grain foods, starchy foods—lower fiber or soft cooked grains may be best tolerated</p> <p>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</p> <p>Fresh soyfoods—soymilk, edamame</p>

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:

Academy of Nutrition and Dietetics (2014). Carcinoid Syndrome and Diet.

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

Carcinoid Cancer Foundation (2008). Nutritional Concerns for the Carcinoid Patient:

Developing Nutrition Guidelines for Persons with Carcinoid Disease.

