



Nutrition and Carcinoid

Miles Hassell MD

Medical Director, Department of Integrative
Medicine, Providence Cancer Center

With assistance from:

Monica E Warner, M.S., R.D., C.D.N.

Carcinoid Cancer Foundation



Good Food + Exercise Are The Most Important Steps To Good Health

- 60-90% reductions in risk of heart disease, cancer, diabetes with Mediterranean or 'prudent Western' diets
- May reduce cancer progression (WINS)
- 40%+ reduction in dementia, significantly improved lifespan
- Daily exercise appears additive
- Nurses Health, Lyon Heart, HALE, Greek EPIC...



Whole Food Mediterranean Diet

For most people, most of the time

- ‘Healthy fat’, not necessarily ‘low fat’
 - Nuts, fish, avocado, extra virgin olive oil, whole oilseeds such as sesame, sunflower and flax
 - Extra virgin olive oil as main vegetable fat;
 - sesame, soy, canola are second- choices
 - Not hydrogenated oils
- 5-10 servings of fruit and vegetables daily
- Whole grains and beans
- Dairy mostly in cultured form: yogurt, cheese
- Other animal proteins in modest amounts
- Modest alcohol, caffeine, dark chocolate (70%)

Foods to avoid

- Hydrogenated oils: Often contain significant amounts of *trans* fat, even if the label says ‘NO TRANS FAT’. For practical purposes these are nutritionally worthless and probably harmful
- Refined carbohydrates: ‘enriched’ flour (white flour), refined sugar, high fructose corn syrup: Empty calories
 - Think twice about fruit juice
- Fake foods, particularly sugar substitutes: Oddball chemicals with no nutritional benefit, potential harm, and maintain your ‘sweet tooth’





Useful Food Axiom

- In general, in our society of over-manipulated food: All food is guilty until proven innocent. Particularly in hospitals



Nutritional supplements

Only use supplements if you have a good reason:
They are associated with both benefit and harm

“Nutrients and other nonnutritive substances relevant to health are readily available in familiar packages called fruits, vegetables, legumes, grains and animal products and they come in concentrations and combinations with which humans have had a long cultural familiarity”

Joan Gussow



Nutrition and Carcinoid

- Every individual must weigh general advice against their own experience
- Advice may not apply to a given patient
- The widest variety of reasonable food choices is generally preferable
- Avoid unnecessary rules
- Solid evidence for many recommendations is lacking...so decide for yourself by cautious experimentation




Key Nutritional Issues For Carcinoid

- Amines in food may cause symptoms
- Increased protein and niacin requirements due to increased serotonin synthesis
- Moderate fat, depending on tolerance, typically 20-30% of dietary calories
 - Emphasize ‘good fat’
- Possible solutions for diarrhea

Carcinoid Nutrition Survey

Signs and symptoms with possible
nutritional implications



	<u>Before Dx</u>	<u>Current</u>
• No Symptoms	4%	14%
• Flushing	52%	45%
• Diarrhea	56%	51%
• Abdominal pain	54%	33%
• Gas and bloating	45%	51%
• Weight loss	36%	21%
• Skin rash	8%	8%
• Fatigue and weakness	48%	60%
• Nausea		20%

n=97 Personal communication, M. Warner 2006

AMINES

Particularly high in aged, fermented and spoiled foods, and can vary widely between batches.

AMINES IN FOODS (VERY HIGH)

TYRAMINE, DOPAMINE

- Aged cheeses (cheddar, Camembert, Stilton)
- Alcoholic beverages
- Smoked, salted or pickled fish or meat (herring, salami, sausage, corned beef, bologna, pepperoni)
- Any spoiled protein foods (chicken liver)
- Yeast extracts and Brewers yeast, hydrolyzed proteins
- Broad beans, sauerkraut, shrimp paste, some soybean products, miso soup, soy sauce, tofu

AMINES IN FOODS (MODERATELY HIGH)

TYRAMINE, DOPAMINE, XANTHENES,
THEOBROMINE

- Caffeine containing drinks, coffee (in large amounts), soda
- Chocolate (in large amounts)
- Some nuts (peanuts, coconuts, brazil nuts)
- Some pizzas, raspberries, banana , avocado





Which Foods cause Most Problems?

2004 study (n=83)

Reaction to:

Main Complaints/Symptoms

- Amine containing foods (n=61)
 - 80% Diarrhea
 - 75% Gas & Bloating
 - 45% Flushing
- Fatty Foods (n=41)
 - 75% Diarrhea
 - 60% Gas & Bloating
- Vegetables (n=35)
 - 33% Gas & Bloating
 - 30% Diarrhea



Conclusions 2004 (n=83) #2

Reaction to:

- Alcohol (n= 40)
- Fruits (n= 25)
- Spicy Foods (n=20)
- Large meals (n=16)

Main Symptoms

- 83 % Flushing
35% Diarrhea
- 76% Diarrhea
15% Gas & Bloating
- 88% Diarrhea
75% Gas & Bloating
- 16% Diarrhea



Top Offending Foods (2005)

- Amine containing foods (caffeine drinks, chocolate, some cheeses etc.)
- Fatty Foods
- Raw vegetables
- Alcohol
- Fruits
- Spicy Foods with pepper, cayenne, mustard. Cinnamon and nutmeg seem OK
- Large meals



SEROTONIN CONTAINING FOODS

To Avoid prior to 24hr Urine 5-HIAA test

HIGH

Walnut Family:
Black/ English Walnuts


Hickory Family:
Shagbark, Pecans

Pineapple, plantains,
Kiwi fruit, plums,
tomatoes

MEDIUM HIGH


Avocado, dates,
grapefruit, cantaloupe,
honeydew, olives,
eggplant

NOTE: Serotonin in food will not aggravate symptoms or tumor growth



Dietary Guidelines For Carcinoid and other Neuro-endocrine Tumors

- If no symptoms or other medical problems:
 - Follow whole food Mediterranean diet or American Institute Cancer Research (AICR) guidelines
 - Portion and weight control
 - Daily exercise habit
 - Adequate sleep



If One Or More Symptoms Of Carcinoid Syndrome

- Mediterranean or AICR diet, avoiding foods that aggravate symptoms
 - High protein
 - Emphasis ‘good’ fat when making choices, may need fat content to be moderate or low
 - 5-10 servings of vegetables and fruit daily if tolerated, steamed may work better
 - Variety helps, and everyone is an individual
 - Broad variations in amines between batches of a given food



If One Or More Carcinoid Symptoms

- Foods most likely to provoke symptoms are large meals, high-amine foods, excessive fat, alcohol, spices
 - Smaller servings or different brands may not cause symptoms
- Niacin or nicotinamide e.g. 25-50 mg twice daily
- Maybe a multivitamin
- Consider fish oil 2 x 1000mg daily with largest meal as source of omega 3 fatty acids
- Consultation with Registered Dietician



Food Sources Of Niacin

- Meat, poultry and fish have the most. Lesser amounts in:
 - Legumes, nuts and soy
 - Whole and enriched grains and cereals
 - Vegetables



Diarrhea

- Benefiber or other fiber supplements works in some cases, pectins (FOS), rice bran
- Banana flakes 15g 1-3 times daily. Also provides lots of potassium. Not fried sweetened banana chips
- Glutamine powder: 1tsp-1 TBSP 1-3 times per day, eg in a little bit of juice
- Fresh ground nutmeg 3 tsp once or twice a day. Potent flavor: Mixed with a nut butter on a cracker
- Probiotic eg lactobacillus or *S. boulardi* (Florastor) 1-2 day
- Coconut if tolerated. Macaroons?



Diarrhea

- Consider:
 - Eliminating lactose (dairy) sources
 - Pancreatic enzymes
 - Other food culprits, including sugars, juices
 - ½ strength juices may work better
 - Small frequent meals often help
 - Medication side effects may be the culprit
 - Non-carcinoid causes
 - Dietician





Books

- The New American Plate (American Institute for Cancer Research)
- The Omega Diet (Simopoulos & Robinson)
- Mediterranean Diet Cookbook (Harmon-Jenkins)
- Eat, Drink and Be Healthy (Walter Willett)

