Nutritional Management in Solid Organ Transplantation

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Objectives

- State the importance of nutritional evaluation for the organ transplant recipient and donor
- Relate transplant medications and dietary interactions
- Explain the importance of maintaining a healthy weight pre- and post- transplant
- Explain post-transplant dietary recommendations

Outline

Pre-Transplant:

- Renal +/- CHO-controlled diet
- Weight management

Post-Transplant:

- Protein for healing
- Liberal diet

Long-Term:

- Diet
- Immunosuppression/food safety
- Food/drug interaction

Sodium (<2,000 mg/day)

Causes the body to retain fluid, causes swelling (edema), and increases thirst

Common sources:

- Table salt (Kosher AND sea salt)
- Deli meats (ham, turkey, roast beef, salami, etc.)
- Other cured animal products (anchovies, sardines, hot dogs)
- Cheese
- Pickles, olives, anything in brine
- Packaged chips/snacks (crackers, Cheez-Its, potato chips, pretzels)
- Canned vegetables including tomato sauce
- Condiments (ketchup, mayo, gravy, BBQ sauce)

Potassium (<2,000 mg/day)

Dairy:

- milk, yogurt

Fruit:

- avocado, bananas, cantaloupe, coconut, figs, guava, honeydew, jackfruit, kiwi, mango, nectarine, oranges, papaya, Anjou pears, persimmons, plantains, pomegranate, prunes, raisins, starfruit, tomatoes, uglifruit

Vegetables:

- artichokes, bamboo shoots, baked beans, dried beans/peas, beet greens, bok choy, Brussel sprouts, cassava, chicory, collard greens, fennel, kohlrabi, lentils, lima beans, okra, parsnips, potatoes, pumpkin, rutabaga, sauerkraut, spinach, succotash, winter squash, sweet potato, swiss chard

Nuts/seeds:

- almonds, pumpkin seeds, sunflower seeds
- beans, soybeans/soy milk

Protein:

- turkey (250mg/3oz), canned tuna (200mg/3oz)

Phosphorus (<1,000 mg/day)

Dairy

- milk/condensed milk, yogurt, cheese, cottage cheese, ricotta cheese, cream, yogurt

Protein:

- Nuts, dried beans/peas, lentils, nut butters, tofu/soybeans/soy milk
- beef/veal/pork/turkey (170-200mg/3oz)
- Fish (pollock, walleye, swordfish, cod, halibut, salmon, tuna – 200-280mg/3oz), oysters (180mg/3 medium), sardines, shrimp, crab

Whole grains

- brown rice, wheat pasta, wheat/raisin bread, quinoa
- cereals including bran flakes, granola, oatmeal, cream of wheat, shredd wheat

Protein

Sources:

Eggs

Meat

Fish

Eggs

Beans

Tofu

Dairy

Nuts/nut butter

Needs:

- Pre-dialysis: 0.8 gram/kg
- HD needs:1.2-1.5 grams/kg
- PD needs:1.3 grams/kg

  - **Serving sizes:**
  - 1 egg = 6 grams
  - 1 oz meat = 7 grams

Fluid

Limit yourself to amount recommended by your doctor

1 cup = 8 oz = 240mL

Fluid

- water, coffee/tea, juice, soda, etc.
- soup
- gelatin
- fruit ice
- ice

Tips

Choose salt substitutes like Mrs. Dash (avoid those containing potassium like “Nu-Salt”)

Soak potatoes in water to leach out potassium

Chew on hard/sour candies to help manage thirst

Carbohydrate-controlled diet

"Diabetic diet"

- Consistent carbohydrate intake
- Do not skip meals
- Favor high fiber sources
- Limit intake of concentrated sweets & caloric beverages

Many principles conflict with "renal" diet: high fiber foods & whole grains are often high in phosphorus

Maintain high fiber diet by choosing low potassium fruits &vegetables

Weight Maintenance

BMI <40 to qualify, **<35 desirable for kidney transplant**

BMI <30 to qualify for pancreas transplant with type 1 DM & undetectable C peptide level

BMI <30 to qualify for pancreas transplant with type 2 DM & detectible C peptide level; "moving" BMI guideline

BMI Chart

WEIGHT lbs	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
kgs	45.5	47.7	50.0	52.3	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7
HEIGHT in/cm	Underweight					Healthy						Overweight				Obese							Extremely obese	
5'0" - 152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1" - 154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	36	37	38	39	40
5'2" - 157.4	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	33	34	35	36	37	38	39
5'3" - 160.0	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38
5'4" - 162.5	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	31	32	33	34	35	36	37
5'5" - 165.1	16	17	18	19	20	20	21	22	23	24	25	25	26	27	28	29	30	30	31	32	33	34	35	35
5'6" - 167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7" - 170.1	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8" - 172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	32	32
5'9" - 175.2	14	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31
5'10" - 177.8	14	15	15	16	17	18	18	19	20	20	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11" - 180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0" - 182.8	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1" - 185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2" - 187.9	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3" - 190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4" - 193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26

Post Transplant

Adequate fluid intake encouraged

Increased protein for healing (for 1-2 months); 1.3-1.5 gm pro/kg

Potassium restriction may be liberalized

Phosphorus restriction may be liberalized / may need to consume extra phosphorus for "hungry bones"

Follow a "heart healthy" diet low in saturated fat, sodium, & sugar and high in fiber

Pancreas transplant

- Liberalization of carbohydrate-controlled diet

Long-term Post-Transplant

Maintain a low sodium diet for blood pressure control

- Choose foods with 140 mg sodium per serving or less
- Choose foods 5% daily value for sodium or less

Maintain a carbohydrate-controlled diet for diabetes control unless s/p pancreas transplant

- NODAT (New Onset Diabetes After Transplant)

Weight maintenance

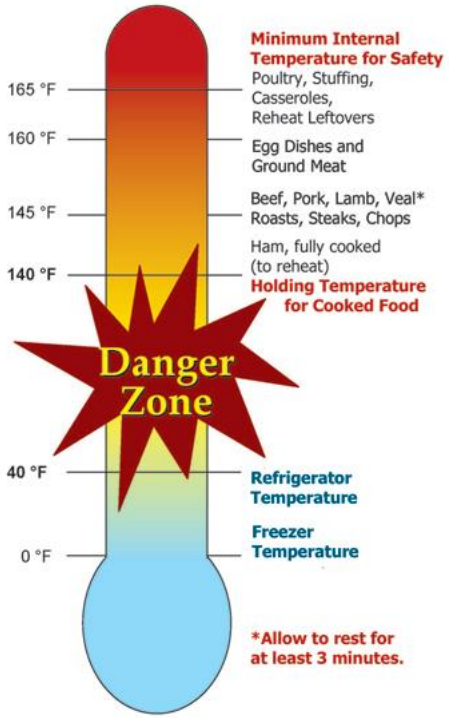
- Medications may cause fluid retention, increased hunger, weight gain
- Long-term improvement in appetite and freedom from renal diet may lead to weight gain

The transplant dietitian is available for ongoing nutrition counseling

Foods to Avoid

Grapefruit or grapefruit juice (interact with medic
Starfruit (toxic to kidneys)
Raw, rare, or undercooked fish, poultry, pork, be
Unpasteurized milk or cheese
Unpasteurized juice or cider
Fresh sprouts (bean sprouts, alfalfa sprouts)
Food that is moldy or spoiled; food past its “use by” date
Pomegranate/pomegranate juice (interact with medications)
Echinacea (strengthens the immune system)

Food Safety
“Keep Hot Foods Hot & Cold Foods Cold”



Hackensack Meridian *Health*

Cooking food to the proper temperature

Tips

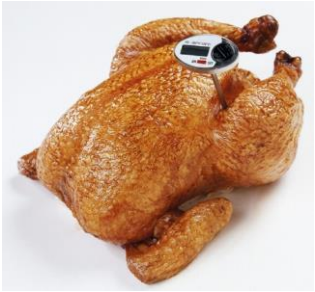
Wash fruits and vegetables well and use a separate cutting board for produce to prevent cross-contamination

Refrigerate leftovers within 2 hours

Avoid salad bars and buffets

Be mindful at a picnic or barbeque of how long food is out and avoid leaving it in the sun

Choose foods freshly served at parties



Drug Reactions

Cyclosporine (Sandimmune, Neoral) & Tacrolimus (Prograf)

- avoid grapefruit (increases the drug's bloodstream concentration, activity, potential side effects)
- can increase potassium levels and decrease magnesium levels

Steroids

- increase appetite and blood sugar
- cause sodium and fluid retention

Mycophenolate mofetil (Cellcept)

- nausea, vomiting, diarrhea

Sirolimus (Rapamune, Rapamycin)

- possible hyperglycemia, possible GI symptoms

Medications can also increase cholesterol and triglyceride levels

- heart-healthy diet important

Call Arielle Greenbaum, Transplant dietitian:

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