Nutritional Considerations in ALS

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Nutritional Considerations in ALS

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Happy National Nutrition Month!
Why is Food so Important?

- Social
- Emotional
- Culture
- Religion
- Physical
Why is Nutrition Important in ALS?

• **Nutrition**: independent risk factor for disease progression
  – Calories are needed to maintain weight. Resting energy expenditure known to be higher in ALS.
  – Association between body mass index (BMI) and ALS survival, with BMI < 18.5 associated with shorter survival
  – BMI 30-35 associated with slower progression, longer survival
Why is Nutrition Important in ALS?

– Adequate nutrition necessary to maintain highest possible level of function
– Improved endurance
– Protect body from infection and illness
– Preserve enjoyment of food and maintain socialization
ALS COSMOS Study

• Amyotrophic Lateral Sclerosis Multicenter Cohort Study of Oxidative Stress
• 302 patients
• Modified Block Food Frequency Questionnaire,
• Function was measured using the ALS Functional Rating Scale–Revised (ALSFRS-R)
• Respiratory function was measured using percentage of predicted forced vital capacity (FVC).
Macronutrient intake did not impact ALSFRS-R score or percent FVC.

Milk was negatively associated with ALSFRS-R and FVC. BUT milk-based supplements slowed functional decline/stabilized weight in another study.

Regression analysis of “good food groups” showed that eggs, fish, poultry, nuts and seeds, beneficial oils, fruits and vegetables in general were positively associated with ALSFRS-R scores and percent FVC.

ALS COSMOS

• Good micronutrient intake was positively associated with ALSFRS-R scores and percent FVC.

• Key micronutrients:
  – Carotenes- carrots, pumpkin, sweet potato, broccoli, spinach
  – Lycopene-strong antioxidant properties. It’s the pigment in red and pink fruits, such as tomatoes, watermelons and pink grapefruit.
  – Fiber from vegetables and grains.

ALS COSMOS

- Omega-3 fatty acids-oily fish, tuna, mackerel, herring, nuts and seeds (walnuts, chia seeds, flaxseeds), oils (flaxseed oil, canola oil) and fortified eggs, milk, soy milks.
- Omega-6 fatty acids-soybean, corn, safflower, sunflower oil, nuts, seeds, meat poultry, fish, eggs.
- Isoflavones- **Soy** and its products, and legume seeds (lentils, beans, peas) are the richest sources. Exhibit antioxidant, anticancer, antimicrobial, anti-inflammatory properties.
High Calorie Diet

- Resting energy expenditure known to be higher in ALS.
- A randomized multicenter trial of pALS with feeding tubes found that high carb, high calorie diet was better tolerated/better outcomes than standard calorie diet (control) or high fat, high calorie diet.

Fat calories can be Fab calories

- Protein – 4 kcal/g. Important to help maintain muscle mass.
- Carbohydrate – 4 kcal/g. Major source of energy in the average diet.
- Fat-9 kcal/g. Most calorie-dense nutrient. Increased circulating cholesterol may have neuro-protective benefits.
- Kasarskis equation [Maintaining Adequate Nutrition: A Continuing Challenge in ALS | The ALS Association](https://www.als.org/als/research/nutrition/maintaining-adequate-nutrition)
- My Data Helps app, search for ALS Nutrition

[Logo: Froedtert & Medical College of Wisconsin]
Calorie-Dense Foods

• Add calories without volume with butter, cheese, gravy, cream, mayo, peanut butter, dressing, dips
• Whole fat dairy
• Ice-cream –yum!
• Casseroles
• Calorie containing beverages
• “Healthy”- olive oil, olives, nuts, nut butters, seeds, avocado, dried fruit
Fatigue and Poor Appetite

- Six small meals - reduce fatigue at meals and fuel body throughout the day
- Select foods that are easy to chew and swallow
- Drink supplements between meals
- Eat your favorite foods
- Cook aromatic foods/presentation/company
- Select calorie-dense foods
Food Preparation

- Occupational therapist recommends assistive devices/feeding assistance for those with UE weakness.
- Convenience meals
- Batch cook meals and freeze single serving portions
- Caregivers setting up snacks/beverages where they are accessible
- Meals on wheels
Protein Foods

- Protein is an important component of muscle and other body tissues.
- Protein requirements 1.2-1.5 g/kg
  - Meat
  - Fish
  - Eggs
  - Dairy (cottage cheese, greek yogurt, milk)
  - Nuts and nut butters
  - Seeds
  - Beans
  - Protein powder/shakes
Oral Nutrition supplements

- Ensure / Equate / Boost PLUS has 100 extra calories per serving
- Carnation Instant Breakfast
- Kate Farms / Orgain
- Ensure Clear (juice)
- Lutrish shakes
- Benecalorie
- Homemade shakes
Brain Power Smoothie

• Ingredients:
  • 2 cups blueberries
  • 1 cup pomegranate juice (or any berry juice)
  • 1 cup ice cubes
  • 1 Tbsp. chia seeds
  • 1 ripe banana, peeled
  • half of an avocado, peeled and pitted
  • http://www.gimmesomeoven.com/brain-power-smoothie-blueberry-avocado-smoothie-recipe/

• Nutrition: 620 calories, 8 g protein, 20 g fat, 117 g carbohydrate, 22 g fiber
Dysphagia

- Coughing and/or choking on food or liquid while swallowing
- A wet or gurgling-sounding voice immediately after swallowing food or liquid
- Difficulty chewing
- Food escaping out of the mouth during chewing or liquid spilling from the lips
- Prolonged mealtimes
- The need for smaller bites and/or sips
- Difficulty managing saliva
- Shortness of breath during meals
Ways to Manage Dysphagia

- Swallow strategies under guidance of the Speech Therapist, Video Swallow Study
- Diet modification
- Dietary supplements
- Feeding tube placement
## Diet Modification

<table>
<thead>
<tr>
<th>Diet Level</th>
<th>Examples of Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: Pureed</td>
<td>Pudding, pureed oatmeal, bread, meats, hummus, pureed fruit and vegetables</td>
</tr>
<tr>
<td>Level 2: Mechanical Soft</td>
<td>Scrambled eggs, meatloaf, well-cooked vegetables, pancakes, mashed potatoes, canned/cooked fruit</td>
</tr>
<tr>
<td>Level 3: Advanced</td>
<td>Bread slices, muffins, pasta, casseroles, baked potatoes, soft/ripe fruits, fish</td>
</tr>
<tr>
<td>Level 4: Regular</td>
<td>No food avoidances or restrictions</td>
</tr>
<tr>
<td>Nectar Thickened Liquids</td>
<td>Slightly thicker than water</td>
</tr>
<tr>
<td>Honey Thickened Liquids</td>
<td>Consistency of honey at room temperature</td>
</tr>
</tbody>
</table>
Diet Modification

IDDSI - Patient Handouts
Diet Modification

Copyright: The International Dysphagia Diet Standardisation Initiative 2016 @ https://iddsi.org/framework/
Regular Diet

- Sample Menu provides:
  - 1700 calories, 82 g protein, 25 g fiber
  - 20% of calories as protein
  - 53% of calories as carbohydrate
  - 27% of calories as fat

Breakfast
- 1 egg
- 1 cup bran cereal
- 1 cup skim milk
- 5 prunes

Lunch
- 4 oz salmon
- 1 cup brown rice
- 1 cup broccoli

Dinner
- 2 oz deli turkey
- 1 oz cheddar cheese
- 1 slice wholegrain bread
- Side garden salad (1.5 cups)
- 1 T Italian dressing
- 1 cup grapes

Snacks
- 1 medium apple
- 1 low fat yogurt

Beverages
- 34 oz Water
- 8 oz coffee with 2 oz skim milk
Pureed Diet

- Sample Menu provides:
  - 1750 calories, 85 g protein, 15 g fiber
  - 20% of calories as protein
  - 53% of calories as carbohydrate
  - 27% of calories as fat
- Note ↓dietary fiber and ↑saturated fat intake increased in order to meet calorie needs

### Breakfast
- 1 egg pureed with 0.5 oz cheese
- 1 cup cream of wheat with 8 oz whole milk and cinnamon
- 6 oz prune juice

### Lunch
- 3 oz salmon pureed
- 1/2 cup pureed rice with ¼ cup chicken broth
- 1/2 cup broccoli pureed with 1 tsp olive oil

### Dinner
- 1 cup canned mashed sweet potato with 2 T butter and 1 T brown sugar

### Snacks
- 1 cup Cottage cheese with ½ cup peaches and ½ cup fruit juice pureed

### Beverages
- 34 oz Thickened (Nectar Thick) Water
- 6 oz coffee with 2 oz whole milk (Nectar thick)
- Ensure Plus (350 kcal, 13 g protein)
Feeding Tube

- Indications for feeding tube placement:
  - Weight loss
  - Chewing/swallowing difficulties – Eating has become a burden
  - Prolonged mealtimes
  - Fatigue after meals
  - No appetite/no interest in food
  - Decline in respiratory function
- Maintain/supplement nutrition, hydration, alternate route for medications.
Benefits

• Promotes adequate intake of:
  – Calories, protein & fluid
  – Weight stabilization
  – It does not prevent eating by mouth

• Decreased risk of aspiration
  – No choking, chewing & swallowing problems

• Improve quality of life

• Easy medication administration

• Feeding times=simple, shorter
  – Energy saved for other activities
Things to Consider….

- **Placement**
  - Sedation necessary
  - Infection risk

- **After placement**
  - Clogging may occur
  - Infection at feeding tube site
  - Replacement of tube
  - Daily care
  - Intolerance to tube feeding formula—work with your Dietitian!
How is it used?

• Syringe feeding
• Gravity feeding (IV pole and bags)
• Pump assisted feedings.

• Orders generally through DME provider.
• Insurance coverage varies.
Tell Your Patients About

The Oley Foundation

• FREE information and support for patients on home tube or IV feedings
  • www.oley.org
  • (800) 776-OLEY
  • www.feedingtubeawareness.org
  • FYI: Information About Feeding Tubes | The ALS Association
Hydration

• Multicenter trial (Sgagnelli et al, 2018) assessing hydration found that survival was two-fold longer in the group above the median for estimated water intake. Regardless of nutrition, hydration is an independent risk factor for survival.

• Increased risk -dysphagia, limited mobility, female

• Monitor urine concentration, bowel function

• Eat foods with a high water content e.g. canned and fresh fruit/vegetables, drinkable yogurt, pudding, juice, purees, cream soups, smoothies, nectars

• Straw, long straw, nosey cup

Full article: Hydration measured by doubly labeled water in ALS and its effects on survival (tandfonline.com)
Constipation

• Dehydration, inactivity, weakened abdominal muscles, insufficient fiber intake
• Increase fiber — fruit, vegetables, whole grains
• Increase fluids
• Prune Juice
• Laxatives and stool softeners
Move It!

- 1 Cup Unprocessed Bran (Store in freezer)
- 1 Cup Apple Sauce
- ½ Cup Prune Juice
- Mix together well-store in refrigerator (1-2 tablespoons per day – adjust as necessary)
Vitamin Supplements

- Vitamin D – study showed association between low levels and ALS. Screening for deficiency*.
- Multi-vitamin with minerals for general health. Should have the approval of US Pharmacopeial Convention
- Coconut Oil
- [www.ALSuntangled.com](http://www.ALSuntangled.com)


Resources
