

## **Cardiac Care Outcomes Assessment Program (COAP) Enhanced Recovery After Surgery (ERAS) Nutrition Protocol for Cardiac Surgery**

Malnourished surgical patients have significantly higher postoperative morbidity, mortality, length of hospital stay, readmission rates, and increased costs associated with their inpatient episodes

We have integrated the Guidelines for Perioperative Care in Cardiac Surgery Enhanced Recovery After Surgery Society Recommendations as well as recommendations by the COAP surgical subcommittee and key stakeholders from cardiac surgical programs across the State.

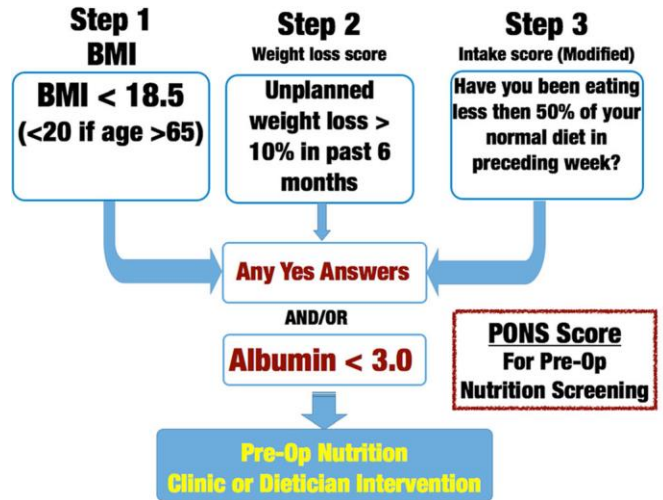
Regarding nutrition, the Guideline recommendations include:

- Preoperative Correction of Nutritional Deficiency
- For patients who are malnourished, oral nutritional supplementation has the greatest effect if started 7 to 10 days preoperatively and has been associated with a reduction in the prevalence of infectious complications in colorectal patients.
- In patients undergoing cardiac surgery who had a serum albumin level less than 3.0 g/dL, supplementation with 7 to 10 days' worth of intensive nutrition therapy may improve outcomes.
- Currently, however, no adequately powered trials of nutritional therapy initiated early in patients undergoing CS who are considered high risk are available.
- This may not be feasible in urgent or emergency settings. Further studies are needed to determine when to delay surgery to correct nutritional deficits.
- Based on these data, correction of nutritional deficiency is recommended when feasible (class IIa, level C-LD).
- Encouraging clear liquids until 2 to 4 hours preoperatively is an important component of all ERAS protocols outside of cardiac surgery. However, no large studies have been performed in populations undergoing cardiac surgery. Based on the data available on cardiac surgery, clear liquids may be continued up to 2 to 4 hours before general anesthesia (class IIb, level C-LD).

## Preoperative nutritional screening and care:

All elective patients should be screened preoperatively for malnutrition.

Use of a standardized screening tool such as the Perioperative Nutrition Screening (PONS) assessment tool is advised.



Other screening tools and interventions:

<b>Have you noticed a decrease in your ability to perform daily activities?</b>	Yes	No
Is it difficult to shower and/or get dressed?	Yes	No
Is it difficult to walk to your car or your mailbox?	Yes	No
Is it difficult to climb stairs?	Yes	No

	0 points	1 point	2 points
Weight loss unintentional	<3 lbs	5-10 lbs	>10 lbs
Meals/day	3-4 meals	1-2 meals or freq snacks	Very little
Functional status	0 Yes Answers	1-2 Yes Answers	3-4 Yes Answers

Scoring:

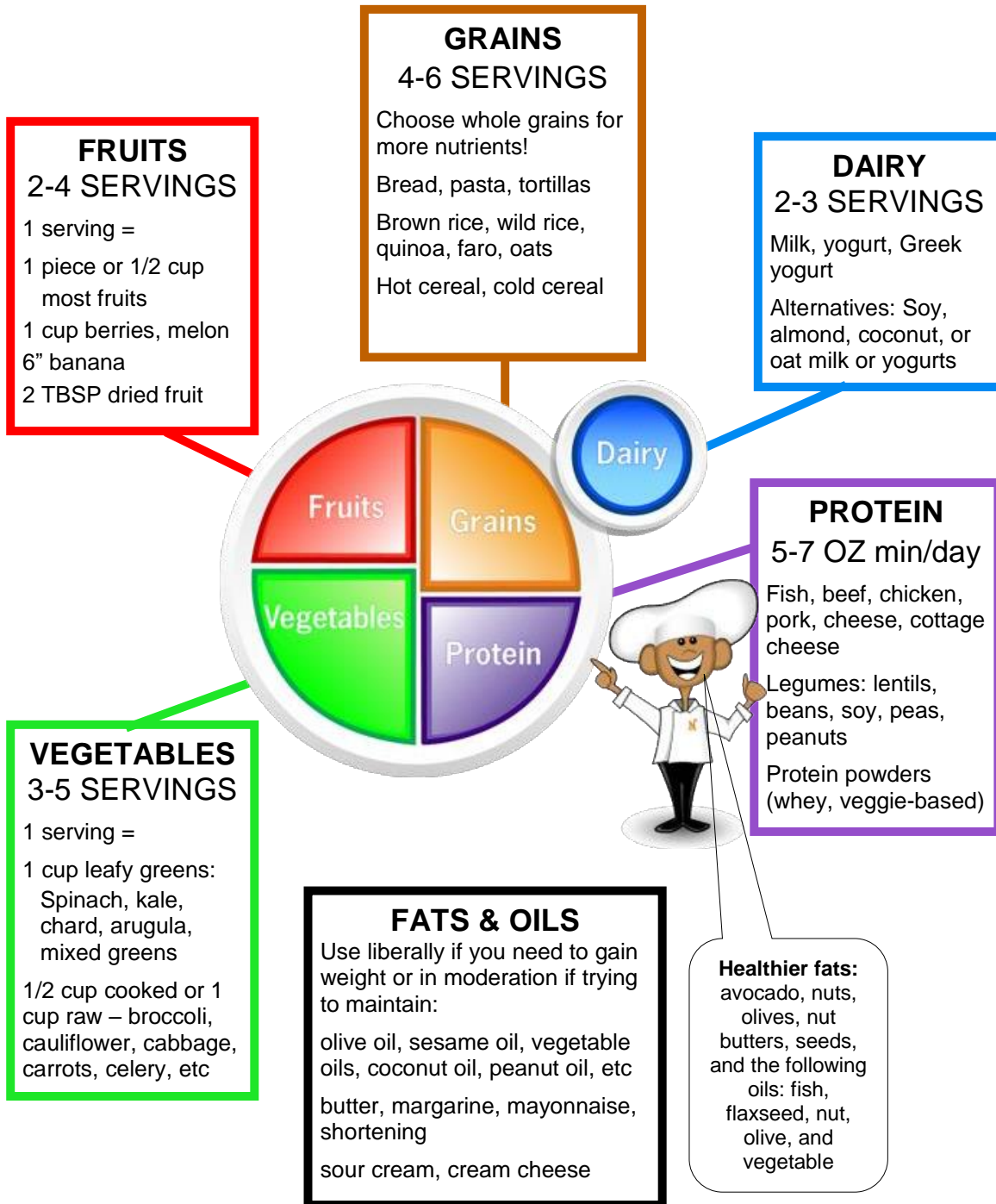
SCORE	Nutritional Risk	Enhanced Recovery overview	Pre-Surgical Nutrition Tips	Increasing Calories & Protein for Surgery	Refer to Dietitian
0 points	Low	X	X		
1-2 points	Moderate	X	X	X	
3-6 points	High	X	X	X	X

Nursing/clinic staff perform an assessment in surgical/preoperative clinics using tools and the results can be uploaded into EMR and trigger a nutrition intervention as appropriate.

Patients at high nutrition risk should be considered for referral to a registered dietitian nutritionist (RDN) for a complete nutrition assessment and intervention.

For diabetic patients, check Hemoglobin A1C and consider referral to diabetes clinic if A1C > 7%.

# ENHANCED RECOVERY Pre-Surgical Nutrition Tips



# ENHANCED RECOVERY

## Tips for Increasing Calories and Protein

Eat small meals or snacks throughout the day

### Make Drinks Count

Choose higher-calorie, protein-rich beverages such as: milk, shakes, smoothies, eggnog, nectars, and juice

- Switch to 2% or whole milk
- Try half & half or evaporated milk in place of milk or water in recipes for pudding, hot chocolate, shakes, soups, or casseroles
- Use less water when reconstituting juices
- If you do not tolerate cow's milk try soy milk, soy yogurt, lactose-free milk or a milk-free supplement, such as Boost or Ensure, on cereal and in recipes



### Push Protein

Increase protein intake with dairy, meat, eggs, nuts, beans, and soy products

#### Dairy:

- Sprinkle powdered milk into scrambled eggs, yogurt, bread mix, casseroles, sauce, and gravy
- Add cheese to casseroles, meat, sandwiches, potatoes, salads, vegetables, rice, and pasta
- Try cottage cheese as a dip, in salad or with vegetables or pasta
- Mix yogurt with cereal, granola, or fruit



#### Meat and Eggs:

- Eat dishes made with eggs: French toast, pancakes, custards, cooked pudding, omelets, quiche, hard-boiled eggs, and cakes
- Add small pieces cooked beef, pork, fish, poultry, or eggs to salads, casseroles, vegetables, soups, omelets, and noodles
- Serve meat with extra gravy or sauce
- Enjoy simple fried foods like chicken or fish





### Nuts, Legumes and Soy:

These foods add protein and healthy fats

- Slather peanut butter or other nut butters on bread, crackers, apples or celery.
- Blend peanut or sesame butter into drinks, yogurt smoothies, or ice cream
- Sprinkle nuts on desserts, salads, ice cream, vegetables, stir-fry, or fruit
- Add soy or legumes to salads, casseroles, soups, stir-fry, or ground meat
- Enjoy hummus on bread, crackers, or vegetables



### Grains:

Grains add calories and fiber plus other important nutrients

- Use high-protein noodles and grains in casseroles and soups
- Make hot cereal with whole milk
- Dredge meat in bread crumbs or flour before cooking
- Top muffins, toast, crackers, pancakes, or waffles with butter, margarine, cream cheese, syrup, jam, peanut butter, cheese, or honey
- Sprinkle granola on ice cream, yogurt, or fruit

These tips provide calories, important nutrients and fiber

- Add mashed fruit to milk, yogurt, shakes, ice cream, and pudding
- Include dried fruit, in breads and cereals, or mix with nuts
- Make Jell-O with juice in place of water and add fruit
- Serve vegetables with dip, butter, or sour cream
- Add sliced olives or avocado to casseroles or salads
- Use guacamole as a dip or topping



### 2000 Calorie High Protein

#### Breakfast:

1/3 cup granola  
1 cup Greek yogurt  
1 Tbsp. honey  
1 cup sliced berries



#### Snack:

2 oz. whole grain crackers  
1 oz. cheese

#### Lunch:

Sandwich (2 slices whole grain bread,  
2 oz. meat + 1 Tbsp. mayonnaise)  
1/2 cup baby carrots + cucumbers  
1 cup whole milk

#### Snack:

1/2 cup 4% cottage cheese  
1/2 cup sliced peaches

#### Dinner:

1 cup cooked rice + 1 Tbsp. butter  
4 oz. teriyaki chicken grilled  
1 cup green salad + 1 Tbsp. dressing

**For Diabetic patients: Recommend modified diet to decrease carbohydrate intake.**

**For patient with Heart Failure: Recommend modified diet for volume and sodium.**

## **Preoperative Carbohydrate Loading:**

Carbohydrate drink 2-3 hour prior to surgery (no modification for diabetic patients).

The Guidelines recommend:

- A carbohydrate drink (a 12-ounce clear beverage or a 24-g complex carbohydrate beverage) 2 hours preoperatively to reduce insulin resistance and tissue glycosylation, and improve postoperative glucose control, and enhance return of gut function.
- In a 2003 Cochrane review of patients undergoing cardiac surgery, carbohydrate loading reduced postoperative insulin resistance and hospital length of stay.
- In a large randomized clinical trial in patients undergoing cardiac surgery, preoperative carbohydrate administration was found to be safe and improved cardiac function immediately after cardiopulmonary bypass. However, it did not affect postoperative insulin resistance.
- Given the current minimal supportive data in patients undergoing cardiac surgery, carbohydrate loading is given a weak recommendation at this time (class IIb, level C-LD).

## **Postoperative Oral and Enteral feeding:**

In absence of any concerns for aspiration, advance diet as soon as tolerated.

Consideration of parenteral nutrition if enteral nutrition is not feasible after 48 hours.

Liberalize postoperative diet instead of cardiac diet while in-hospital with a focus on high protein and healthy fat consumption to aid in malnutrition correction and recovery while in the inflammatory phase for up to 2 weeks post-operative.

Nutrition consultation and education for all patients within 24-48 hours for long term dietary recommendations.

The Guidelines include other important, ungraded ERAS elements as below:

- Early postoperative enteral feeding and mobilization after surgery are considered other essential components of ERAS surgical protocols.
- Programs tailor recommendations to achieve these goals working with staff with expertise in nutrition, early cardiac rehabilitation, and physical therapy.

**Recommended team constitution:**

Surgeons

Anesthesiologists

Nurse Practitioners

Physician Assistants

Dietitians

Nurses

Caregivers

Patients