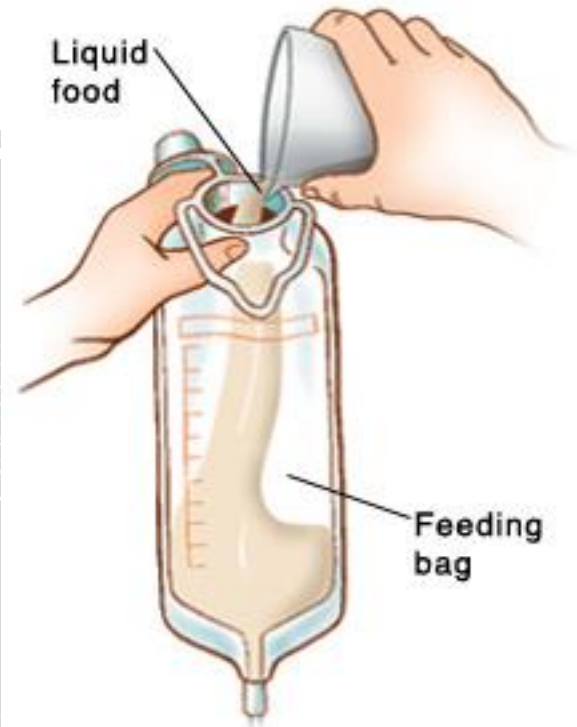


Nutrition in surgery



**DIETITIAN: RASHED ALNAFA
KKUH**

AIMS OF NUTRITION IN SURGERY

= PREPARE/ENHANCE RECOVERY

= PREVENT MALNUTRITION OR DIET-RELATED CONSEQUENCES, (eg, nausea, vomiting, diarrhea, dumping syndrome and dehydration)

= DEFINE PATIENT WHO AT RISK AND WHO NEEDS FOR NUTRITION SUPPORT

= DEFINE SPECIAL NUTRITION NEEDS FOR PATIENTS UNDERGOING MAJOR SURGERYS e.g. for cancer

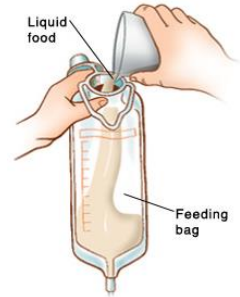


Nutrition care for patient undergoing surgery is vary, in related to:

- The type of surgery (Minor, Major, Elective, urgent)
- THE require OF extensive nutrition support.
- Route of Nutrition, orally or via TF
- Postoperative complications such as obstruction, fistula, or anastomotic leaks, delayed recovery.



MALNUTRITION

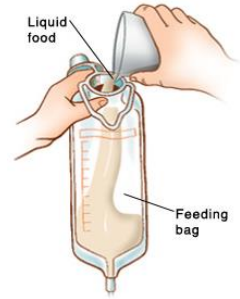


- Malnutrition is a broad term that can be used to describe any imbalance in nutrition; from over-nutrition to under-nutrition.
- Observed up to 40-60% of surgical patient on admission/remains under-diagnosed in 70% of patient in hospital settings.
- malnutrition seen in hospitalized patients is often a combination of cachexia (disease-related) and malnutrition (inadequate consumption of nutrients) as opposed to malnutrition alone.

▪

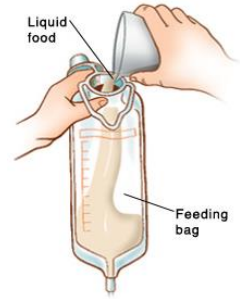


HOW TO DETECT PATIENT AT RISK



- Nutritional risk screening in all patients on hospital admission or first contact:
 - ❖ BMI $< 18 \text{ kg/m}^2$
 - ❖ Combined: weight loss $> 10\%$ or $> 5\%$ over 3 months and reduced BMI or a low fat free mass index (FFMI)
 - ❖ Preoperative serum albumin $< 30 \text{ g/l}$ (with no evidence of hepatic or renal dysfunction)





▪ **LABORATORY MEASURES**

- **Serum proteins such as albumin and prealbumin**
- **Transferrin,**
- **Nitrogen balance**
- **Electrolytes**
- **Total cholesterol**
- **Indicators of inflammation such as C-reactive protein (CRP) and total lymphocyte count (TLC),**



ENHANCE RECOVERY AFTER SURGERY

ERAS



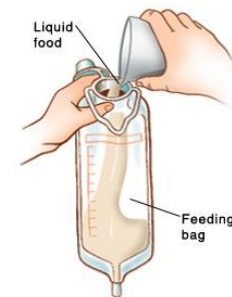
- **Enhanced recovery of patients after surgery (“ERAS”) has become an important focus of perioperative management.**
- **From a metabolic and nutritional point of view, the key aspects of perioperative care include:**
 - **Avoidance of long periods of pre-operative fasting**
 - **Re-establishment of oral feeding as early as possible after surgery**
 - **Integration of nutrition into the overall management of the patient metabolic control, e.g. of blood glucose;**
 - **Reduction of factors which exacerbate stress-related catabolism or impair gastrointestinal function;**
 - **Early mobilization**



NUTRITION SUPPORT



WHO NEEDS



- **Patient at Nutrition risk/or Malnourished**
- **Postoperative complications:**
 - – Ileus more than 4 days
 - Sepsis
 - Fistula formation
 - Massive bowel resection
- **Intractable vomiting;**
- OTHER CONDITIONS :**
- **Maxillofacial and esophageal surgery**



Pre-op:

- Fasting from midnight is unnecessary in most patients
- ALLOW clear fluids until two hours before anaesthesia
- Nutritional Support prior to major surgery, appropriate period of (7-14)days, For patient with sever nutrition risk

POST-op

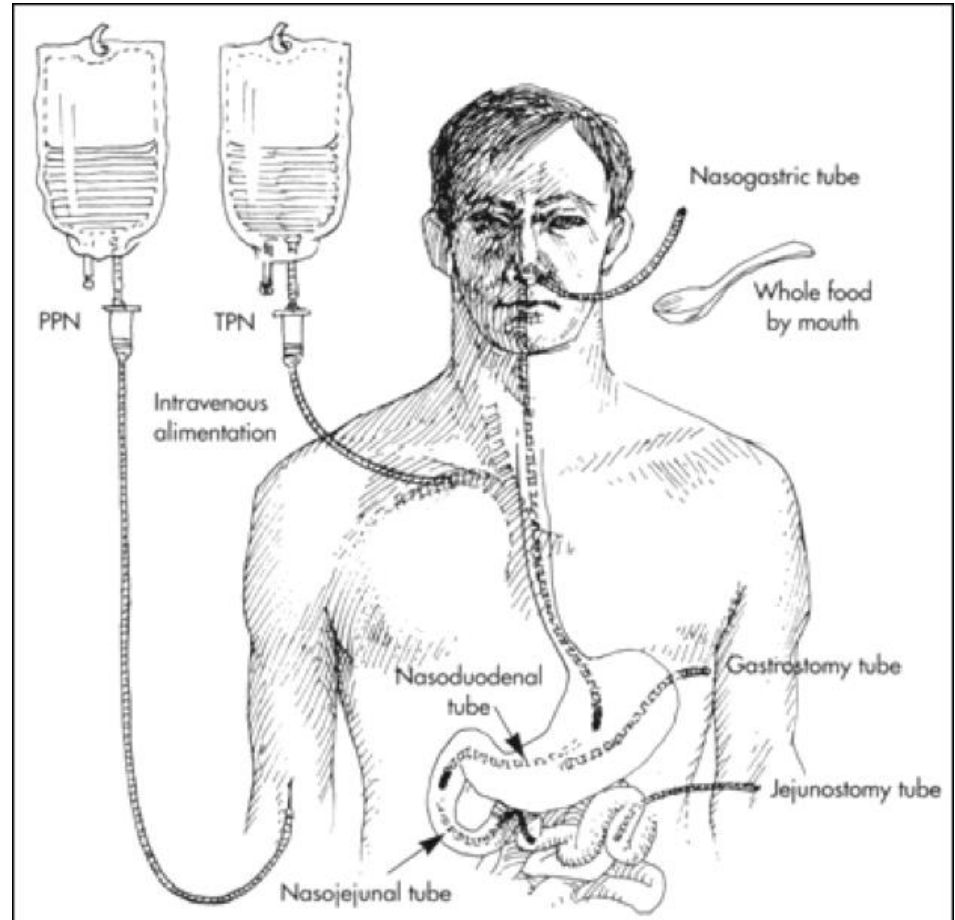
- Oral intake, including clear liquids, can be initiated within hours after surgery in most patients.
- Early tube feeding (within 24 h) shall be initiated in patients in whom early oral nutrition cannot be started, and in whom oral intake will be inadequate

(patients undergoing major head and neck surgery or gastrointestinal surgery for cancer, patients with obvious malnutrition at the time of surgery)



MODES OF ADMINISTRATION

- **What Route should be used**
EN vs PN



ENTERAL FEEDING

Indications:

- **Malnourished patient expected to be unable to eat adequately for > 5-7 days**
- **Adequately nourished patient expected to be unable to eat > 7-9 days**

(Maxillofacial and esophageal surgery)

- **Adaptive phase of short bowel syndrome**

▪ **Contraindications:**

- **Intestinal obstructions or ileus,**
- **Severe shock**
- **Intestinal ischemia**
- **High output fistula**
- **Severe GI bleeding**



PARENTERAL NUTRITION

- **For the surgical patient PN is beneficial in the following ;**
- Ileus
- Intestinal fistula (high-output)
- Initial phase in case of short bowel or after small bowel transplant or during periods of rejection
- **PN should only be initiated if the duration of therapy is anticipated to be >7 days.**
- IN some cases, Combined EN/PN showed clinical benefits when compared with EN or PN alone.



ASSESS NUTRITION NEEDS



ENERGY AND PROTEIN NEEDS

BMI (kg/m ²)	Weight (kg)	Kcal/kg	Protein* (gm/kg)
< 30	Actual	20-25 (minor)	1g/kg/day (minor)
		25-30 (major)	1.5-2.0 (major)
30-50	Actual	11-14	1.9-2.0 (IBW)
	Ideal	22-25	
> 50	Ideal	22-25	2.5 (IBW)

Protein Needs for Adults based on Albumin level and special conditions:

Condition	Albumin level	Protein requirement
Normal nutrition (Healthy adults)	3.5 gm/dL	0.8 to 1 gm/kg/day
Normal nutrition (Elderly adults)	>3.5 gm/dL	0.8 to 1 gm/kg/day
Mild depletion	2.8-3.5 gm/dL	1 -1.2 gm/kg/day
Moderate depletion	2.1-2.7 gm/dL	1.2-1.5 gm/kg/day
Severe depletion	2.1 gm/dl	1.5-2 gm/kg/day



FLUIDS NEEDS

Age (years)	ml/kg	
18-65	30-35	Increased Fluid needs (30-35 ml/kg actual BW): short gut syndrome, high output ileostomy or fistula, excessive diarrhea, high NGT output, large draining wounds, chest tube and JP drain losses.
65+	25 -30	

Reference: <http://health.qld.gov.au/masters/copyright.asp>



Calculating Fluid Needs for Obese (BMI \geq 30)

Adjusted Weight	Fluid per day	OR 30-35 ml/kg Adjusted body weight with allowances for extra losses via drains (draining wounds, chest tube and JP drain losses)
40-60 kg	1500 - 2000 ml	
60-80 kg	2000 - 2500 ml	
> 80 kg	2500 - 3000 ml	

Reference: <http://health.qld.gov.au/masters/copyright.asp>



Major surgery nutrition-related challenges



Surgery	Nutrition Sequelae	Nutrition Management
Partial colon resection	Loose bowel movements	Initially low-residue nutrition therapy with patient self-determining foods not well tolerated; progress to regular diet as tolerated
Total colectomy	Diarrhea, dehydration, electrolyte imbalance	Low-residue nutrition therapy; adaptation takes place over time and patient can slowly increase fiber as tolerated, increased fluid and electrolyte intake
Rectal with colostomy	Psychosocial issues caused by fear of expelling gas, odor-producing foods	Avoidance of potentially gas- and odor-producing foods
Small bowel resection	Varies depending on length of small bowel resected, potential malabsorption	Determine length and area of bowel resected. If more than 100 cm ileum is resected, increased fluid and electrolyte balance problems; TPN- fluid/electrolyte replacement until patient is able to maintain nutrition orally; slowly increase diet as tolerated to lactose free, complex carbohydrate, moderate fat, six small feedings, long-term vitamin (magnesium, B-12) supplementation
Liver resection	Hypoglycemia	Small, frequent, high-protein meals



OSTOMY (COLOSTOMY/ILESTOMY)

- Replace Fluid losses via the ostomy.

(200ml-600ml/day, normal output stoma)

- Post Ostomy, low fiber diet for the first 2 weeks, gradually progress to balance diet (avoid beans, peas, corn)
- Chew food completely
- Small frequent meals
- High protein diet, low simple carbohydrate, high sodium.
- low fat and/or oxalate for the absence of the terminal ileum.



OSTOMY (COLOSTOMY/ILESTOMY)

High output stoma;

- Limit fluids with meals/30min before or after.
- Restrict ORAL FLUIDS to 500ml daily (Meet fluid /electrolyte needs intravenously), low osmolality fluids.
- Oral Glucose-electrolyte solution/ORS
- Slowing intestinal transit time via loperamide, pectin, and fibers may promote improved absorption
- Losses of 2 L to 3 L ostomy output per day can also contribute to losses of magnesium, zinc, bicarbonate, potassium, and sodium.



IMMUNONUTRITION

- **In the preoperative phase, formulas enriched with arginine, omega-3 fatty acids have been shown to improve postoperative immune response, gut oxygenation and enhance recovery.**
- **Antioxidants, including vitamins C and E, betacarotene, and selenium are often added in an effort to reduce oxidative stress among patients with acute metabolic stress. (wound healing)**



THE END

