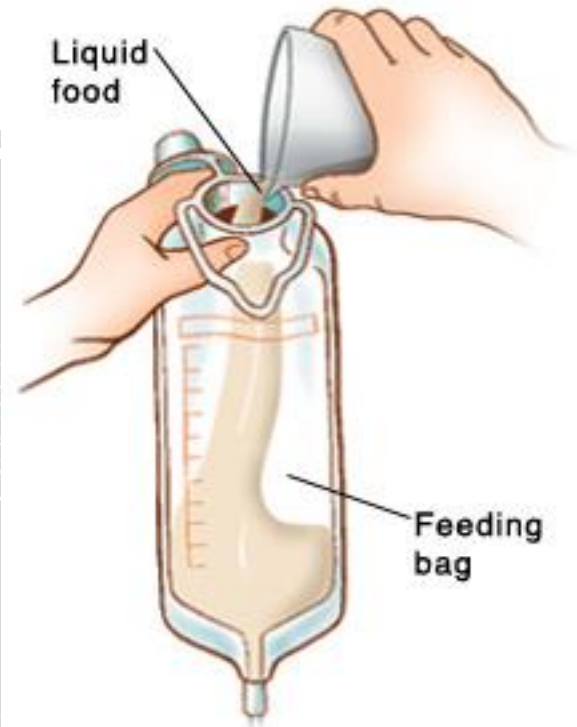


Nutrition in surgery



**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

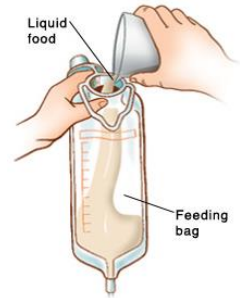


Nutrition care for patient undergoing surgery is vary, in related to:

- 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

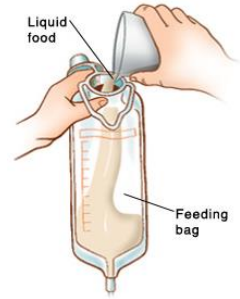


- Malnutrition is a broad term that can be used to describe any imbalance in nutrition; from over-nutrition to under-nutrition.
- Observed up to 40-60% of surgical patient on admission/remains under-diagnosed in 70% of patient in hospital settings.
- malnutrition seen in hospitalized patients is often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

▪

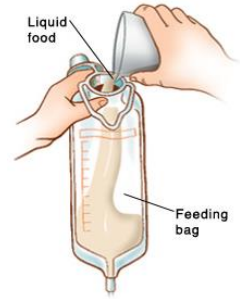


HOW TO DETECT PATIENT AT RISK



- Nutritional risk screening in all patients on hospital admission or first contact:
 - ❖ BMI $< 18\text{kg}/\text{m}^2$
 - ❖ Combined: weight loss $> 10\%$ or $> 5\%$ over 3 months and reduced BMI or a low fat free mass index (FFMI)
 - ❖ Preoperative serum albumin $< 30\text{ g}/\text{l}$ (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



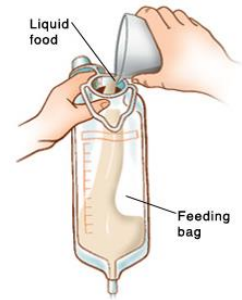
- **Enhanced recovery of patients after surgery (“ERAS”) has become an important focus of perioperative management.**
- **From a metabolic and nutritional point of view, the key aspects of perioperative care include:**
 - **Avoidance of long periods of pre-operative fasting**
 - **Re-establishment of 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

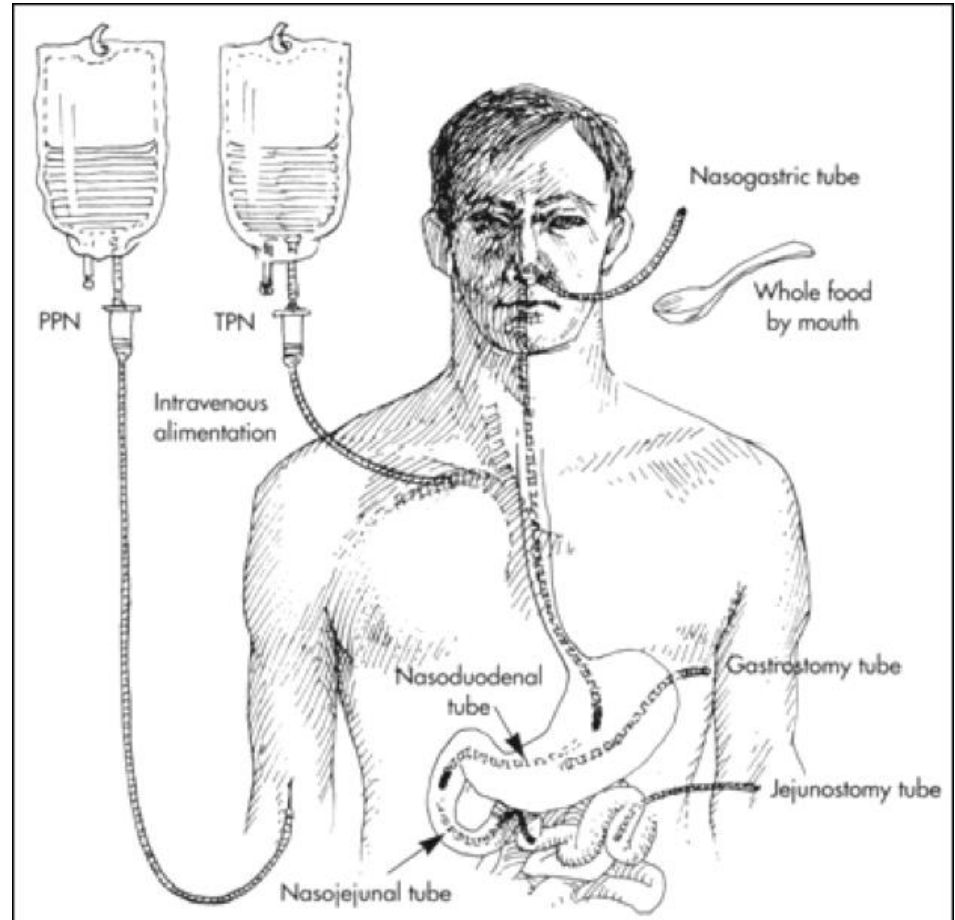
POST-op

- 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>



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)**



SELECT FORMULA

■



<p>Branched-Chain Amino Acid 1.5kcal/1ml</p>	<p>Nutrihep</p>	<p>Hepatic Encephalopathy, Nutrition support for hepatic disease with elevated ammonia level</p>
<p>Low carbohydrate 1.5kcal/ml</p>	<p>Oxepa Pulmocare</p>	<p>modulate the inflammatory response in critically ill, mechanically ventilated patients, especially those with SIRS (systemic inflammatory response syndrome, eg, sepsis, trauma, burns), ALI (acute lung injury) or ARDS (acute respiratory distress syndrome)</p>
<p>Nutrient Dense/ Immunonutrients 1.2-1.6kcal/ml</p>	<p>IMPACT RECOVERY FORTICARE</p>	<p>For faster recovery (before and after surgery),Severe trauma/injury, support colonic health, Pressure ulcer/wound, Dietary mgt of Cachexia in cancer , pancreatic cancer, lung cancer undergoing chemotherapy</p>
<p>Clear Liquids with Protein/ Fat-Free 1.5kcal/ml</p>	<p>Resource Breeze Fortijuice</p>	<p>Clear Liquid High Protein, bowel prep, fat malabsorptive/fat restricted, pre or post-surgical , nausea/vomiting/oncology</p>

<p>Standard 1kcal/1ml</p>	<p>Ensure Nutren 1.0 Osmolite RTF Energy zip 1.0 Jevity Trophic with fiber</p>	<p>Standard formula can be used via ENETRAL FEEDING OR orally - Can be used for all cases</p>
<p>Dens-calories 1.5g/ml</p>	<p>Ensure Plus Fortisip Resource Plus Ensure Two-Cal</p>	<p>for stressed patients and those requiring low-volume feedings</p>
<p>Modified carbohydrate 1kcal/1ml</p>	<p>Glucerna Resource Diabetic Diamax</p>	<p>Diabetes Mellitus, Hyperglycemia, Glucose Intolerance</p>
<p>Low electrolytes 1.5-2kcal/1ml</p>	<p>Novasource Renal HD Max</p>	<p>Dialysis / Renal Failure / Renal Disease, Electrolyte and Fluid restriction</p>

Semi-Elemental	Perative 1.3 Pivot 1.5 Peptamen Complete Alitraq	Malabsorption syndrome, impaired gastrointestinal function, short bowel syndrome, inflammatory bowel disease, pancreatic insufficiency, chronic diarrhea, radiation enteritis, HIV/AIDS-related malabsorption, transition diet from TPN
Protein 6g per scoop	Beneprotein Prosource	Protein-calorie malnutrition, wound healing e.g. burns, pressure ulcers
Prebiotics	Banatrol	Diarrhea and loose stool associated with tube feeding, antibiotics , oncology treatment and Clostridium difficile

THE END

