



<https://www.dietdoctor.com/medical-students-learn-almost-nothing-nutrition-lifestyle>



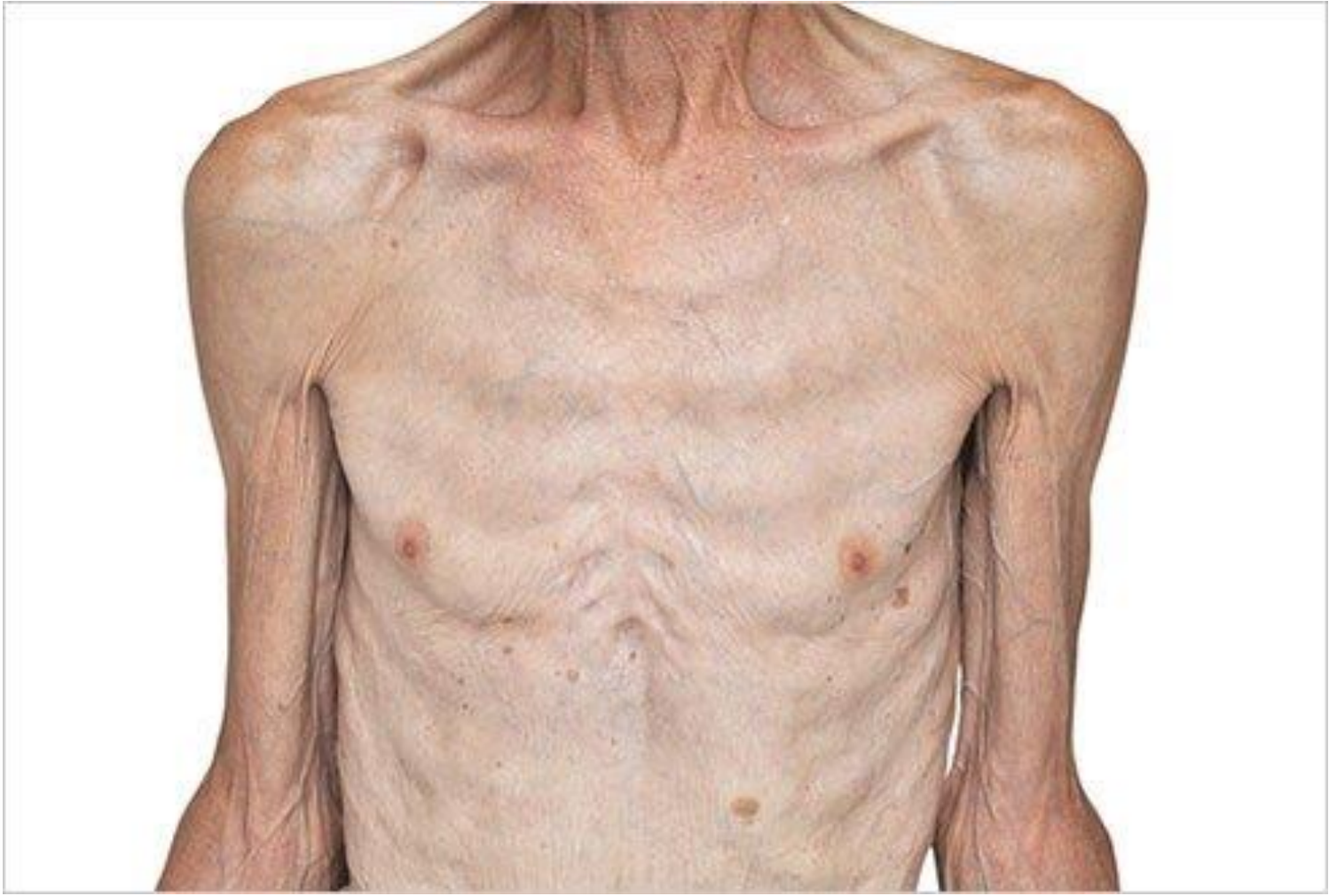
Nutrition in SCT



Pariya Phanachet

Division of Nutrition and Biochemical Medicine, Department of Medicine

Faculty of Medicine, Ramathbodi Hospital, Mahidol University





Nutrition Screening and Assessment Tools

- Malnutrition Screening Tool (MST); validated in oncology patients
- Patient-Generated Subjective Global Assessment (PG-SGA)
- Nutrition Risk Screening 2002 (NRS 2002), NUTRIC Score; validated in critically ill patients
- สมาคมผู้ให้อาหารทางหลอดเลือดดำและทางเดินอาหารแห่งประเทศไทย <http://www.spent.or.th/index.php/event/article/13>
 - แบบคัดกรองภาวะโภชนาการ
 - Nutrition Alert Form (NAF)
 - NT 2013: Nutrition Assessment





สมาคมผู้ให้อาหารทางหลอดเลือดดำและทางเดินอาหารแห่งประเทศไทย
SOCIETY OF PARENTERAL AND ENTERAL NUTRITION OF THAILAND

Email Password เข้าสู่ระบบ

Don't have the account? | Forget Password

ภาษาไทย | English

- Home
- About
- Education & Meeting
- Publication & Communication
- Grants & Funds
- Memberships & Services
- Galleries
- Nutrition Assessment Program

Event&Publication > การประชานิการณ (ร่าง) คำนะนำการดูแลทางโภชนาการในผู้ป่วยใหญ่




การประชานิการณ (ร่าง) คำนะนำการดูแลทางโภชนาการในผู้ป่วยใหญ่

การประชานิการณ
(ร่าง) คำนะนำการดูแลทางโภชนาการในผู้ป่วยใหญ่
ที่นอนในโรงพยาบาล พ.ศ. 2560



www.spent.or.th/index.php/event/article/13

การร
(ร่าง) คำ
ที่นอนใน



QR C
เพื่อลงทะเบียน


คำแนะนำการดูแลทางโภชนาการในผู้ป่วยผู้ใหญ่ที่นอนโรงพยาบาล พ.ศ.2560.pdf

แบบคัดกรองภาวะโภชนาการ new.pdf

แบบประเมินภาวะโภชนาการ NAF.pdf

แบบประเมินภาวะทุพโภชนาการ NT.pdf

Supn



คำแนะนำการดูแลทางโภชนาการในผู้ป่วยผู้ใหญ่ที่นอนโรงพยาบาล พ.ศ.2560.pdf

แบบคัดกรองภาวะโภชนาการ new.pdf

แบบประเมินภาวะโภชนาการ NAF.pdf

แบบประเมินภาวะทุพโภชนาการ NT.pdf

06:06
2561-06-07

SPENT Nutrition Screening Tool



หัวข้อการคัดกรอง	ครั้งที่ 1		ครั้งที่ 2		ครั้งที่ 3	
	วันที่.....	วันที่.....	วันที่.....	วันที่.....	วันที่.....	วันที่.....
	ใช่	ไม่ใช่	ใช่	ไม่ใช่	ใช่	ไม่ใช่
1. ผู้ป่วยมีน้ำหนักตัวลดลง โดยไม่ได้ตั้งใจในช่วง 6 เดือนที่ผ่านมาหรือไม่						
2. ผู้ป่วยได้รับอาหารน้อยกว่าที่เคยได้ (> 7 วัน)						
3. BMI < 18.5 หรือ ≥ 25.0 กก./ตร.ม. หรือไม่						
4. ผู้ป่วยมีภาวะโรควิกฤต หรือกึ่งวิกฤตร่วมด้วยหรือไม่						

2. ผู้ป่วยได้รับอาหารน้อยกว่าที่เคยได้ (> 7 วัน)						
3. BMI < 18.5 หรือ ≥ 25.0 กก./ตร.ม. หรือไม่						
4. ผู้ป่วยมีภาวะโรควิกฤต หรือกึ่งวิกฤตร่วมด้วยหรือไม่						
ผู้คัดกรอง						

ผลการคัดกรอง

- ถ้าตอบ ใช่ ≥ 2 ข้อ ทำการประเมินภาวะโภชนาการต่อ หรือปรึกษานักกำหนดอาหาร/ทีมโภชนาบำบัด
- ถ้าตอบ ใช่ ≤ 1 ข้อ ให้คัดกรองซ้ำสัปดาห์ละ 1 ครั้ง ในช่วงที่อยู่โรงพยาบาล

NUTRITION ALERT FORM แบบประเมินภาวะโภชนาการ



Better Nutrition for Better Life

ชื่อ-สกุล	ชาย	หญิง	อายุ	ปี	HN	วัน/เดือน/ปีที่รับ		
การวินิจฉัยเบื้องต้น	ข้อมูลจาก		ผู้ป่วย	ญาติ	อื่นๆ			
ทำเครื่องหมาย ✓ ในช่องโดยเลือกเพียง 1 ช่องในแต่ละหัวข้อใหญ่และหัวข้อย่อย (ยกเว้น 6,8 เลือกได้มากกว่า 1 ช่อง) และใส่คะแนนในช่อง								
1. ส่วนสูง/ ความยาวตัว/ ความยาวช่วงแขนจากปลายนิ้วกลางทั้ง 2 ข้าง (Arm span)						คะแนนครั้งที่ 1	คะแนนครั้งที่ 2	คะแนนครั้งที่ 3
วัดส่วนสูง	ชม. วัดความยาวตัว	ชม. Arm span	ชม. ญาติบอก	ชม.				
2. น้ำหนักและค่าดัชนีมวลกาย (ค่าดัชนีมวลกาย (BMI) = น้ำหนัก (กก.)/ ส่วนสูง (ม.) ²)						น้ำหนัก	น้ำหนัก	น้ำหนัก
2.1 น้ำหนัก	✗ ชั่งในท่านอน (1)	□ ชั่งในทำยืน (0)	□ ชั่งไม่ได้ (0)	□ ญาติบอก (0)	กก. คะแนน	กก. คะแนน	กก. คะแนน	
2.2 BMI	✗ BMI < 17.0 กก./ ม ² (2)	□ BMI 17.0-18.9 กก./ ม ² (1)	□ BMI 18.1-29.9 กก./ ม ² (0)	□ BMI ≥ 30.0 (1)	กก./ม ² คะแนน	กก./ม ² คะแนน	กก./ม ² คะแนน	
หากไม่ทราบน้ำหนัก ใช้ผล Albumin หรือ ผล Total Lymphocyte Count (TLC)						Albumin	Albumin	Albumin
2.1 ผล Albumin	□ ≤ 2.5 g/dl (< 25 g/l) (3)	✗ 2.6-2.9 g/dl (26-29 g/l) (2)	□ 3.0-3.5 g/dl (30-35 g/l) (1)	□ >3.5 g/dl (35 g/l) (0)	g/dl คะแนน	g/dl คะแนน	g/dl คะแนน	
2.2 ผล TLC	□ ≤ 1,000 cells/mm ³ (2)	✗ 1,001-1,200 cells/mm ³ (1)	□ 1,201-1,500 cells/mm ³ (1)	□ >1,500 cells/mm ³ (0)	cells/mm ³ คะแนน	cells/mm ³ คะแนน	cells/mm ³ คะแนน	
[TLC = (Total WBC X % Lymphocyte)/ 100] อย่างน้อยอย่างหนึ่ง								
3. รูปร่างของผู้ป่วย						1		
	□ พอมมาก (2)	✗ พอม (1)	□ อ้วนมาก (1)	□ ปกติ-อ้วนปานกลาง (0)	คะแนน	คะแนน	คะแนน	
4. น้ำหนักเปลี่ยนใน 4 สัปดาห์						2		
	✗ ลดลง/พอมลง (2)	□ เพิ่มขึ้น/อ้วนขึ้น (1)	□ ไม่ทราบ (0)	□ คงเดิม (0)	คะแนน	คะแนน	คะแนน	

5. อาหารที่กินในช่วง 2 สัปดาห์ที่ผ่านมา						
5.1 ลักษณะอาหาร	<input type="checkbox"/> อาหารน้ำๆ (2) <input type="checkbox"/> อาหารนุ่มกว่าปกติ (1)	<input type="checkbox"/> อาหารเหลวๆ (2) <input type="checkbox"/> อาหารเหมือนปกติ (0)		คะแนน	คะแนน	คะแนน
5.2 ปริมาณที่กิน	<input type="checkbox"/> กินน้อยมาก (2) <input type="checkbox"/> กินมากขึ้น (0)	<input type="checkbox"/> กินน้อยลง (1) <input type="checkbox"/> กินเท่าปกติ (0)		คะแนน	คะแนน	คะแนน
6. อาการต่อเนื่อง > 2 สัปดาห์ที่ผ่านมา (เลือกได้มากกว่า 1 ข้อ)						
6.1 ปัญหาทาง	<input type="checkbox"/> สำลัก (2) <input type="checkbox"/> กินลำบาก	<input type="checkbox"/> เคี้ยว/กลืนลำบาก/ได้อาหารทางสายยาง (2) <input type="checkbox"/> รับประทานอาหารไม่ปกติ (0)		คะแนน	คะแนน	คะแนน
	<input type="checkbox"/> อ่อนเพลีย (2)					
	<input type="checkbox"/> ท้องอืด (2)					
	<input type="checkbox"/> ท้องเสีย (2)					
	<input type="checkbox"/> ไข้ (0)					
	<input type="checkbox"/> ปัญหาอื่น					
	<input type="checkbox"/> ระดับความรุนแรงน้อยถึงปานกลาง (3 คะแนน) <input type="checkbox"/> DM (เบาหวาน) (3) <input type="checkbox"/> CKD-ESRD (ไตเรื้อรัง) (3) <input type="checkbox"/> Septicemia (ติดเชื้อในกระแสเลือด) (3) <input type="checkbox"/> Solid cancer (มะเร็งทั่วไป) (3) <input type="checkbox"/> Chronic heart failure (หัวใจล้มเหลวเรื้อรัง) (3) <input type="checkbox"/> Hip fracture (ข้อสะโพกหัก) (3) <input type="checkbox"/> COPD (ปอดอุดกั้นเรื้อรัง) (3) <input type="checkbox"/> Severe head injury (บาดเจ็บที่ศีรษะรุนแรง) (3) <input type="checkbox"/> ≥ 2° of burn (แผลไฟไหม้ระดับ 2 ขึ้นไป) (3) <input type="checkbox"/> CLD/Cirrhosis/Hepatic encephalopathy (ตับเรื้อรัง) (3) <input type="checkbox"/> อื่นๆ*_____ (3)	<input type="checkbox"/> ระดับความรุนแรงมาก (6 คะแนน) <input type="checkbox"/> Severe pneumonia (ปอดบวมขั้นรุนแรง) (6) <input type="checkbox"/> Critically ill (ผู้ป่วยวิกฤต) (6) <input type="checkbox"/> Multiple fracture (กระดูกหักหลายตำแหน่ง) (6) <input type="checkbox"/> Stroke/CVA (อัมพาต) (6) <input type="checkbox"/> Malignant hematologic disease/Bone marrow transplant (มะเร็งเม็ดเลือด/ปลูกถ่ายไขกระดูก) (6) <input type="checkbox"/> อื่นๆ*_____ (6) *หากไม่ตรงโรคที่มี ให้คะแนนตามความหนักเบา		คะแนน	คะแนน	คะแนน

0-5 คะแนน

NAF A = Normal or
Mild Malnutrition

ไม่พบความเสี่ยง หรือ
มีภาวะทุพโภชนาการน้อย

6-10 คะแนน

NAF B = Moderate
Malnutrition

มีภาวะทุพโภชนาการปานกลาง

≥ 11 คะแนน

NAF C = Severe
Malnutrition

มีภาวะทุพโภชนาการรุนแรง

Hair-Pulling Test

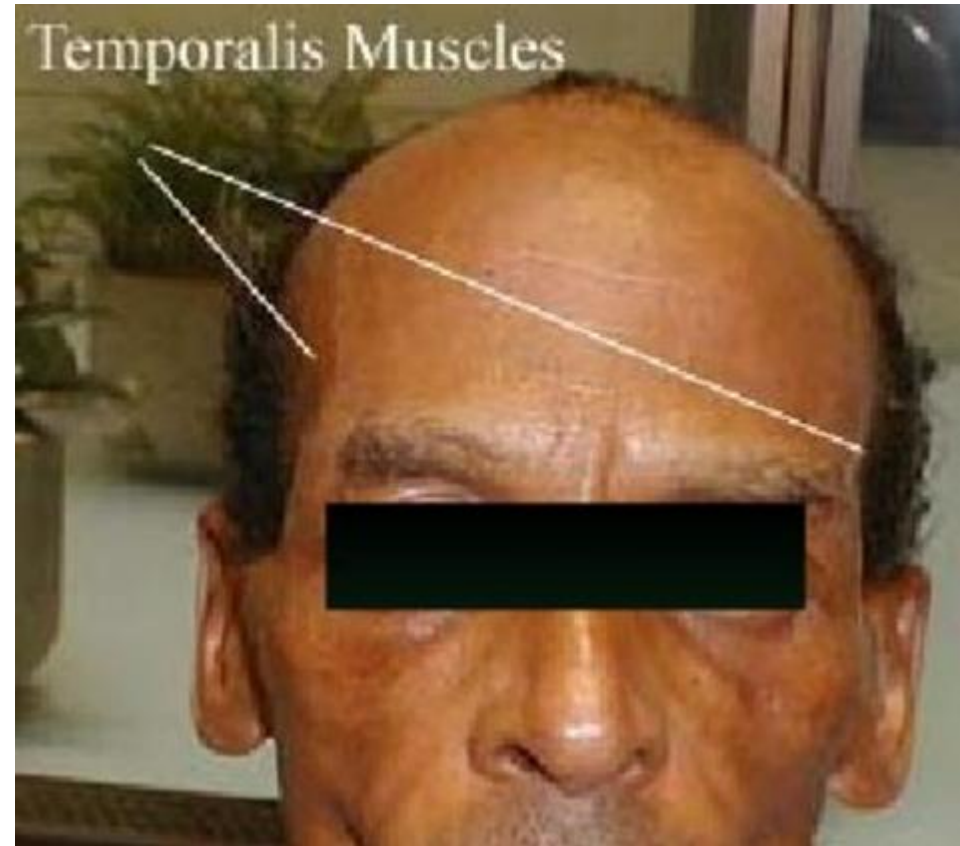
- Deficiency:
 - Protein
 - Biotin
 - Zinc



- A. Approximately 60 hairs are grasped between the thumb, index, and middle fingers near the scalp.
- B. Hair is firmly, but not forcibly, tugged away from scalp as fingers slide along the hair shaft.
- C. Positive: 6 in 10 times

Temporalis Muscle Wasting

- Deficiency:
 - Energy
 - Protein



Tongue Papillae

Normal



Decreased



- Deficiency:

- Thiamine (B1)
- Riboflavin (B2)
- Pyridoxine (B6)
- Iron
- Biotin

Glossitis
or
Strawberry
tongue



Available from: <http://emedicalhub.com/inflamed-taste-buds/>

Available from: http://www.jordi.com.br/detalhe_artigo.asp?id=18

Available from: <http://medical-dictionary.thefreedictionary.com/strawberry+tongue>



Angular Stomatitis

- Deficiency:
 - Riboflavin (B2)
 - Pyridoxine (B6)
 - Iron

White Band



- Normal nail growth 0.1 mm/day

Available from: <http://www.webmd.com/skin-problems-and-treatments/ss/slideshow-nails-and-health>

Available from: https://en.wikipedia.org/wiki/Mees%27_lines

Energy and Protein Requirement

Conditions			Energy		Protein	
Healthy people			Women	1,200-1,500 kcal/day	<input type="checkbox"/> 0.8-1.0	g/kg.IBW/day
			Men	1,800-2,000 kcal/day		
General patients (OPD, IPD)			<input type="checkbox"/> 30-35 (40)	kcal/kg.IBW/day	<input type="checkbox"/> 1.2-1.5 (2.0)	g/kg.IBW/day
Critically ill patients (ICU)			<input type="checkbox"/> Use indirect calorimetry if possible or			
Normal weight						
BMI	18.5-30	kg/m ²	<input type="checkbox"/> 20-25	kcal/kg.IBW/day	<input type="checkbox"/> 1.2-1.5 (2.0)	g/kg.IBW/day
BMI	30-40	kg/m ²	-		<input type="checkbox"/> ≥ 2.0	g/kg.IBW/day
BMI	30-50	kg/m ²	<input type="checkbox"/> 11-14	kcal/kg.ABW/day	-	
BMI	≥ 40	kg/m ²	-		<input type="checkbox"/> ≥ 2.5	g/kg.IBW/day
BMI	≥ 50	kg/m ²	<input type="checkbox"/> 22-25	kcal/kg.IBW/day	-	

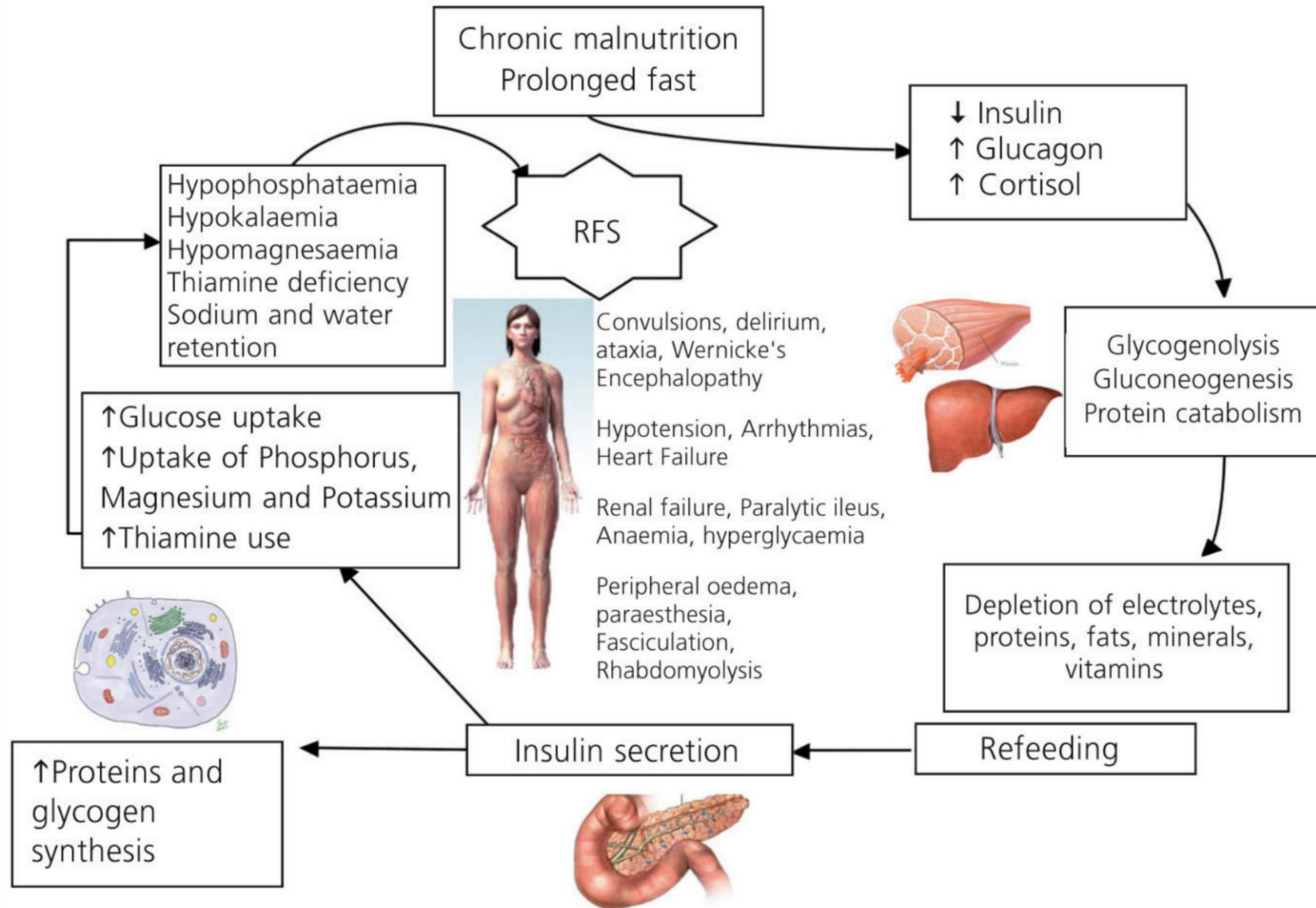


Energy and Protein Requirement

Conditions	Energy	Protein
Chronic kidney disease (CKD) patients No renal replacement therapy (RRT) <ul style="list-style-type: none"> No stress Non-catabolic AKI With RRT <ul style="list-style-type: none"> Hemodialysis (HD) Peritoneal dialysis (PD) Continuous RRT (CRRT) 	<input type="checkbox"/> 30-40 kcal/kg.IBW/day	<input type="checkbox"/> 0.8-1.3 g/kg.IBW/day in eGFR <30 mL/min <input type="checkbox"/> 0.8-1.0 g/kg.IBW/day <input type="checkbox"/> 1.0-1.5 g/kg.IBW/day <input type="checkbox"/> 1.0-1.5 g/kg.IBW/day, may need more <input type="checkbox"/> Max 1.7 g/kg.IBW/day
Patients at risk of refeeding syndrome	<input type="checkbox"/> 5-10 kcal/kg.ABW/day Monitor and correct K^+ , Mg^{2+} , PO_4^{2-} Also Na^+ and thiamine 200-300 mg/day Step energy until goals, as above	<input type="checkbox"/> As above

Refeeding Syndrome

- The clinical complications that occur as a result of fluid and electrolytes shifts during nutritional rehabilitation of malnourished patients.
- These complications are potentially fatal.



Clinical Manifestation	
↓ Phosphate (PO_4^{2-})	<p>CVS: heart failure, arrhythmia, hypotension, cardiomyopathy, shock, death</p> <p>Renal: acute tubular necrosis (ATN), metabolic acidosis</p> <p>Skeleton: rhabdomyolysis, weakness, myalgia, diaphragm weakness</p> <p>Neurology: delirium, coma, seizure, tetany</p> <p>Endocrine: hyperglycemia, insulin resistance, osteomalacia</p> <p>Hematology: hemolysis, thrombocytopenia, leukocyte dysfunction</p>
↓ Potassium (K^+)	<p>CVS: hypotension, ventricular arrhythmias, cardiac arrest, bradycardia or tachycardia</p> <p>Respiratory: hypoventilation, respiratory distress, respiratory failure</p> <p>Skeleton: weakness, fatigue, muscle twitching</p> <p>GI: diarrhea, nausea, vomiting, anorexia, paralytic ileus, constipation</p> <p>Metabolic: metabolic acidosis</p>
↓ Magnesium (Mg^{2+})	<p>CVS: Paroxysmal atrial or ventricular arrhythmias, repolarization alternans</p> <p>Respiratory: hypoventilation, respiratory distress, respiratory failure</p> <p>Neuromuscular: weakness, fatigue, muscle cramps (Trousseau and Chvostek), ataxia, vertigo, paresthesia, hallucinations, depression, convulsions</p> <p>GI: abdominal pain, diarrhea, vomiting, loss of appetite, constipation</p> <p>Other: anemia, hypocalcemia</p>
↓ Sodium (Na^+)	<p>CVS: heart failure, arrhythmia</p> <p>Respiratory: respiratory failure, pulmonary edema</p> <p>Renal: renal failure</p> <p>Skeleton: muscle cramps fatigue, fluid retention, swelling (edema)</p>
↓ Vitamin	<p>Deficiency of thiamine (especially in alcoholism)</p> <p>Neurology: Wernicke-Korsakoff syndrome, Korsakoff's psychosis</p> <p>CVS: CHF, lactic acidosis, beriberi disease</p> <p>Skeleton: muscle weakness</p>

Subjects at Risk of Refeeding Syndrome

Unintentional weight loss:

- Loss of >5% of BW in 1 month
- Loss of >7.5% of BW in 3 months
- Loss of >10% of BW in 6 months
- Undernourished children

Increased nutrient losses/decreased nutrient absorption:

- Significant vomiting and/or diarrhea
- Dysfunction or inflammation of the gastrointestinal tract (IBD)
- Chronic pancreatitis
- Chronic antacids users (these binds minerals)
- Chronic high-dose diuretics users
- After bariatric surgery, SBS

Low nutrient intake:

- Patients starved for >7 days
- Prolong hypocaloric feeding or fasting
- Chronic swallowing problems and other neurological disorders
- Anorexia nervosa
- Chronic alcoholism
- Depression in the elderly
- Chronic infectious diseases (e.g. AIDS, Tbc)
- During convalescence from catabolic illness
- Post-operative patients
- Diabetic hyperosmolar states
- Morbid obesity with prolong weight loss
- Homeless, social deprivation
- Idiosyncratic/eccentric diets
- Hunger strikers

NICE Guideline for Management of Refeeding Syndrome

Patients at risk for refeeding syndrome

ONE or more of the following: -OR-

BMI <16 kg/m²

Unintentional weight loss of >15% in the previous 3-6 months

Little or no nutritional intake for >10 days

Low levels of K⁺, PO₄²⁻, or Mg²⁺ before refeeding

TWO or more of the following

BMI <18.5 kg/m²

Unintentional weight loss of >10% in the previous 3-6 months

Little or no nutritional intake for >5 days

History of alcohol abuse or drugs including insulin, chemotherapy, antacids, or diuretics

Recommendations derived from low grade evidence (cohort, case series, consensus expert opinion).

Mehanna HM, Moledina J, Travis J. Refeeding syndrome: what it is, and how to prevent and treat it. *BMJ*2008;336:1495.



Patients at Risk

Check Na^+ , K^+ , Ca^{2+} , PO_4^{2-} , Mg^{2+}

Before feeding starts, thiamine 200-300 mg PO OD, vitamin B high potency 1-2 tab PO tid (or full dose IV vitamin B), and MTV or trace element supplement

Start feeding 5-10 kcal/kg/day

Slowly increase feeding over 4-7 days

Rehydrate carefully and supplement and/or correct levels of K^+ (2-4 mmol/kg/day), P_4^{2-} (0.3-0.6 mmol/kg/day), Ca^{2+} and Mg^{2+} (0.2 mmol/kg/day IV or 0.4 mmol/kg/day PO)

Monitor Na^+ , K^+ , Ca^{2+} , PO_4^{2-} , Mg^{2+} for the first 2 weeks and treatment as appropriate

Calculation

- Height 170 cm
- UBW 90 kg
- IBW 57.8 kg
- ABW 50 kg
- BMI 17.3 kg/m²

Energy kcal/kg/day						
	5	10	15	20	25	30
UBW	450	900	1,350	1,800	2,250	2,700
IBW	289	578	867	1,156	1,445	1,734
ABW	250	500	750	1,000	1,250	1,500

Protein 1.0-1.5 g/kg.IBW/day = 57.8-86.7 g/day

Standard of Ramathibodi Hospital diet

Types of Meal	kcal/day (avg.)	Protein g (%)	Fat g (%)	CHO g (%)
Clear Liquid Diet	240	0	0	60 (100)
Full Liquid Diet	420	15.5 (15)	5 (13)	78 (72)
Congee (Joke)	750	33 (18)	21 (25)	108 (72)
Soft Diet	1,500-1,800 avg. 1,500	50-70 (12-15) avg. 55	40-60 (25-30) avg. 50	190-270 (50-60) avg.210
Regular Diet	1,800-2,000 avg.1,800	55-75 (12-15) avg.65	50-67 (25-30) avg.60	225-300 (50-60) avg.250

For diabetic diet: Calorie can request in order of Protein: Fat: CHO = 12-15%: 25-30%: 50-55%

Causes of Poor Nutritional State during Transplantation

- Mucositis
- N/V caused by CMT/RT
- Acute or chronic GVHD
- Poor absorption of food following total body irradiation
- Dental problems
- Infection of GI tract
- Altered taste and dry mouth
- Dislike of food offered and lack of availability of favorite foods
- Anxiety or distress

Monitoring

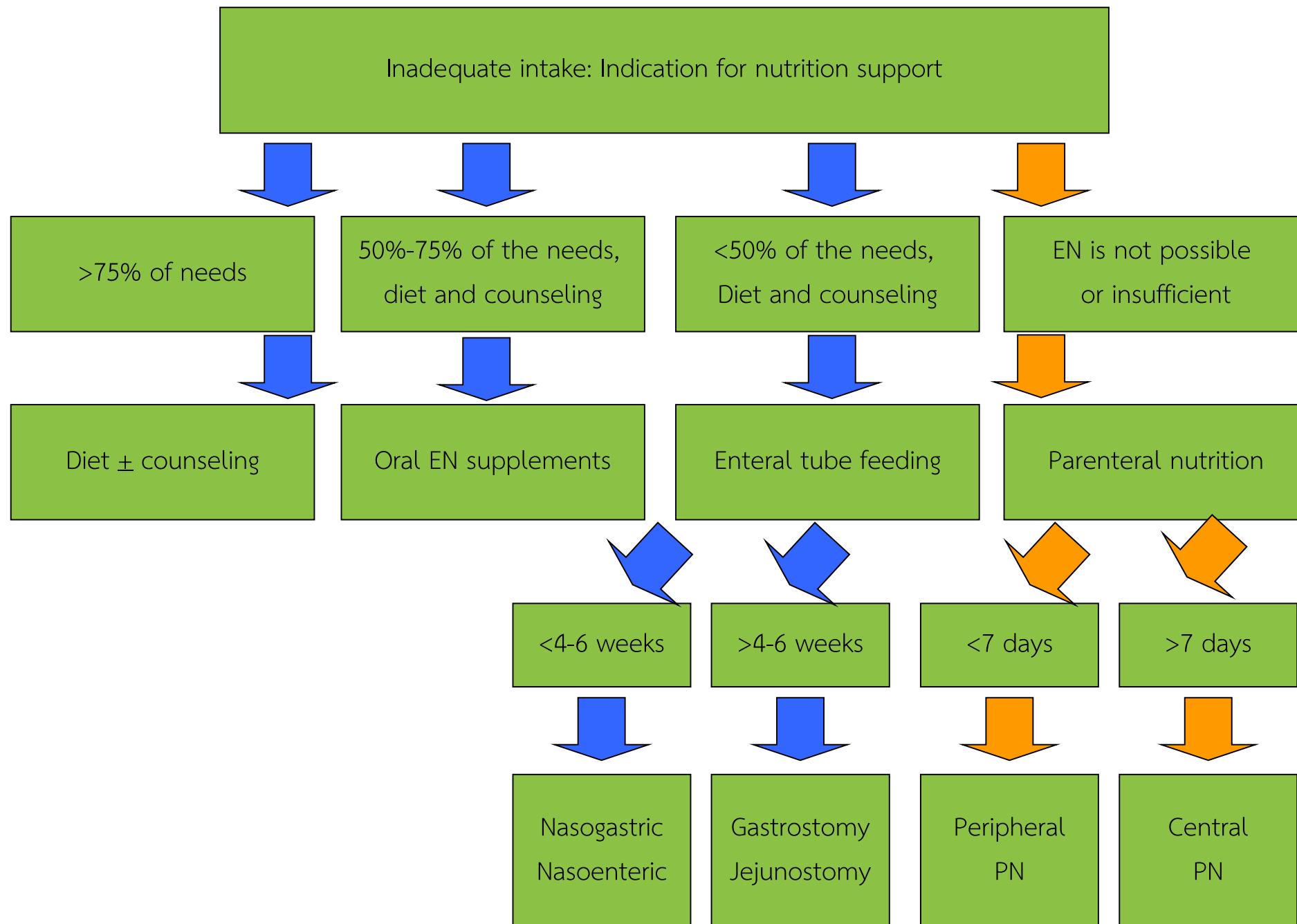
- Diet history
- Fluid and electrolytes
- Reconsider nutrients requirement
 - Energy
 - CHO:Protein:Fat
 - Vitamins
 - Minerals
 - Trace elements

Nutritional Requirements in Hematopoietic Stem Cell Transplants

Nutrients			No severe malnutrition: mild complications		Severe malnutrition: severe complications	
Protein	(g/kg/day)		1.5-1.8		1.8-2.5	
Calories	(kcal/kg/day)		25-30		35-45	
Conditions			Energy		Protein	
Healthy people			Women	1,200-1,500 kcal/day	<input type="checkbox"/>	0.8-1.0 g/kg.IBW/day
			Men	1,800-2,000 kcal/day		
General patients (OPD, IPD)			<input type="checkbox"/>	30-35 (40) kcal/kg.IBW/day	<input type="checkbox"/>	1.2-1.5 (2.0) g/kg.IBW/day
Critically ill patients (ICU)			<input type="checkbox"/>	Use indirect calorimetry if possible or		
Normal weight						
BMI	18.5-30	kg/m ²	<input type="checkbox"/>	20-25 kcal/kg.IBW/day	<input type="checkbox"/>	1.2-1.5 (2.0) g/kg.IBW/day
BMI	30-40	kg/m ²	-		<input type="checkbox"/>	≥ 2.0 g/kg.IBW/day
BMI	30-50	kg/m ²	<input type="checkbox"/>	11-14 kcal/kg.ABW/day	-	
BMI	≥ 40	kg/m ²	-		<input type="checkbox"/>	≥ 2.5 g/kg.IBW/day
BMI	≥ 50	kg/m ²	<input type="checkbox"/>	22-25 kcal/kg.IBW/day	-	

Nutrition Care Plan

- N/V
- Mucositis peak at 10-14 days posttransplant
- Crampy abdominal pain diarrhea and increased bowel permeability peak at 1-2 weeks and return to normal by 3-4 weeks after transplant



Calculation

- Height 170 cm
- UBW 90 kg
- IBW 57.8 kg
- ABW 50 kg
- BMI 17.3 kg/m²

Energy kcal/kg/day						
	5	10	15	20	25	30
UBW	450	900	1,350	1,800	2,250	2,700
IBW	289	578	867	1,156	1,445	1,734
ABW	250	500	750	1,000	1,250	1,500

Protein 1.0-1.5 g/kg.IBW/day = 57.8-86.7 g/day

	Protein/1,000 kcal	Comments	CHO:Prot:Fat	N:NPC Normal 1: 150-180 Stress 1: 100-120
Energy 1,800 kcal/day, Protein 80 g/day				
Pan-enteral	30 g	MCT 48%, Low Osm	43:12:45	1:183
Isocal	32.5 g	MCT 21.1%	50:13:37	1:167
Ensure	37.5 g		54:14:32	1:153
GenDM	38 g	DM, FOS	55:15:30	1:140
Nutren Optimum	39.8 g	MCT 26.4%	45:15:40	1:134
Jevity	40 G	MCT 6%, Fiber (FOS 7 g and Insoluble 17.6 g)	55:15:30	1:133
Peptamen	43.3 g	MCT 73.3%, Hydrolyzed protein	50:15:35	1:131
GlucernaSR	50 g	DM, fiber 8.2 g	50:19:31	1:107
Neomune	62.5 g	MCT 50%, arginine, glutamine	50:25:25	1:75
Aminoleban	64 g	BCAA	60:25:15	1:75
Prosure	66.5 g/1,000mL	EPA 1.1 g+DHA 0.48g, 1.26:1 (P16.6g/250mL)	59:21.6:18.7	-
Nepro HP	81 g/1,000mL	CKD (Low Na, K, P), 1.8:1 (P17.82g/220mL)	31.8:18:48.8	-

Glutamine

- Supports immune, muscle, gut functions
- Reduces infectious complications
- Improves tolerance to adjuvant therapy
- Enhances activity of NK lymphocytes
- Potentiates TNF-induced tumor cytotoxicity

Glutamine

- Benefits of Oral Glutamine Supplementation: Patients with Chemotherapy/ Radiation Therapy
- Systemic Review
 - Grade B recommendation for the use of oral glutamine in patients with chemotherapy/ radiation therapy induced mucositis
 - Intake of 20-30 g/day and early initiation are recommended

Glutamine

- No effect of oral or IV glutamine on overall transplant-related mortality at day +100
- PN + glutamine VS PN for reducing LOS are no longer definite
- **Not enough evidence** to recommend for or against glutamine to reduce anticancer therapy side effects especially in high dose protocols

Crowther M. et al. Systematic review and meta-analysis of studies of glutamine supplementation in HSCT. Bone Marrow Transplant. 2009;44:413-25.

Murray SM. et al. Ion support for BMT patients. Cochrane Database. Syst Rev. 2009;21:1-63.

ESPEN Guidelines: nutrition support in cancer

J. Arends(DE)

ESPEN Congress Geneva 2014

Other Issues

Types	Intensity	Time	Frequency
Aerobic	60-80% of MHR	>300 min/wk	Most days of the week
	80-90% of MHR	>150 min/wk >75 min/wk	
Resistance	70-80% of RM	8-15 times/set	3-5 sets/muscle
Balance/LOM	-	-	-

- Exercise
 - Recommend maintenance or increased level of physical activity during and after treatment to support muscle mass, physical function, and metabolic pattern
 - Suggest resistance exercise to maintain muscle strength and muscle mass during treatment
- Medication to increase appetite
 - Suggest using **corticosteroid** for **restricted period of time** but to be **aware of potential side effects** (e.g. muscle wasting)
 - Suggest using **progestin** for a **limited period of time** but to be **aware of potential serious side effects**
 - Suggest to consider **cannabinoids** to attempt to improve taste disorders and anorexia

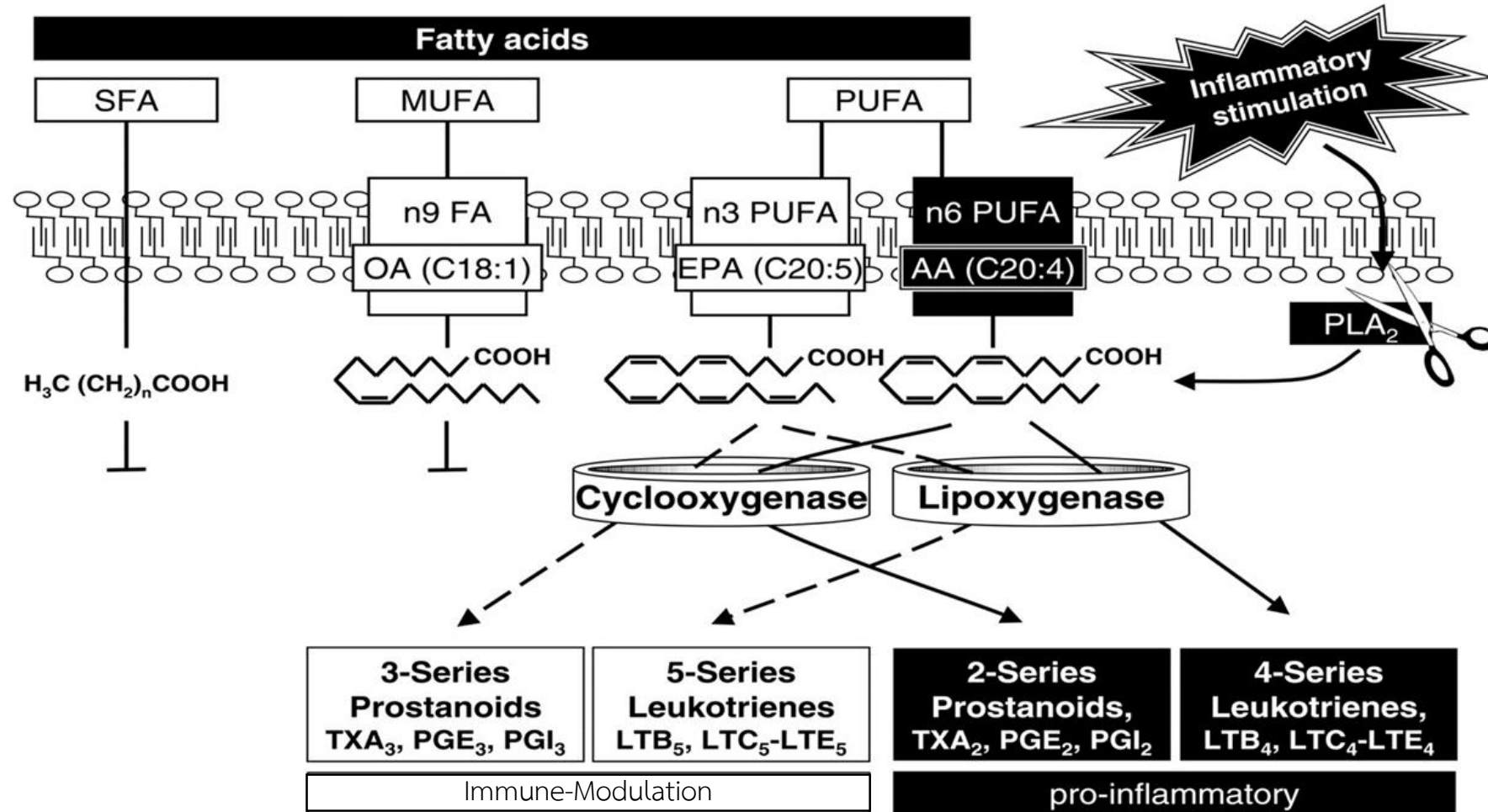
Other Issue 02

- **Androgens** to increase muscle mass: insufficient data
- **BCAA** to improve fat free mass: **not enough clinical data**
- **NSAIDs** to improve BW in weight losing patients: **not enough data**
- **Omega-3 FA** to **improved appetite and body weight**: in patient undergoing CMT at risk of weight loss, suggest to use the supplementation with LC n-3 fatty acid or fish oil to stabilize/improve appetite, food intake, lean body mass and body weight
- Enhanced recovery after surgery (**ERAS**) care: **we recommend for all cancer patients undergoing either curative resectional or palliative surgery**
- Oral/enteral **immunonutrition** (glutamine): **we recommend in upper GI cancer patients undergoing surgical resection**

Catabolic Response Mediators

- Tumor-derived
 - Proteolysis-inducing factor (PIF)
 - Lipid mobilizing factor (LMF)
- Host-derived
 - Cytokines
 - Eicosanoids
 - Neuroendocrine

Metabolisms of fatty acids after inflammatory activation of phospholipase A₂



Beneficial Effects of EPA

- Clinical studies have shown that the supplementation with fish oil fatty acid could affect the progress of cachexia in cancer patients
- The supply of EPA at daily dosages of 3, 4, and 6 g has stopped and partly reversed weight loss of patients

Swails, W; JPEN 21(5), 266-274, 1997

Barber, M.D; J Nutr. 129, 1120-1125, 1999

Wigmore, S.J; Nutrition and Cancer 36(2), 177-184, 2000

EPA (n-3 Fatty Acid) and Cancer Types

- Pancreatic tumor^{1,2,3}
- Lung cancer^{1,4,5}
- Head and neck tumor⁶
- Leukemia and solid tumor⁷ (in children)
- Colorectal cancer⁸
- Esophageal cancer⁹

Effective doses
EPA \geq 2 g/day

1. Bauer and Capra. Support Care Cancer. 2005;13:270-4.

2. Moses, et al. Br J Can. 2004;90:996-1002.

3. Moses, et al. Clin Nutr. 2001;20:21(abstract).

4. Guarcello, et al. Nutr Ther & Metab. 2006;24:168-75.

5. der Meij V, et al. Clin Nutr. 2008;3:111(P193b).

6. De Luis, et al. Ann Nutr Metab. 2005;49:95-9.

7. Bayram, et al. Pediatr Blood Cancer, in press. 2009.

8. Read, et al. Support care Cancer. 2007;15:301-7.

9. Ryan, et al. Ann Surg, in press. 2009

Commercial Products

- Omacor[®] (1 g/ cap = 51 ₺)
 - EPA 0.465 g + DHA 0.375 g + Vit E 4 mg
 - EPA 2 g = 4.3 tab x 51 ₺ = 255 ₺
- Neomune[®] (1668 kcal/ 400 g/ bottle = 399 ₺)
 - EPA 0.96 g + DHA 0.1.04 g
 - EPA 2 g = 2 bottle x 399 ₺ = 798 ₺
- Prosure[®] (315 kcal/ 250 mL/ can = 151 ₺)
 - EPA 1.1 g + DHA?
 - EPA 2 g = 2 cans x 151 ₺ = 302 ₺
- Impact[®] (303 kcal/ pack = 150 ₺)
 - EPA 1.8 g + DHA 1.2 g
 - EPA 2 g = 2 pack x 150 ₺ = 300 ₺

Fat and Fatty Acid in Thai Fish

Fish	Fat g/ 100g	Fatty Acid mg/100g				
		SFA	MUFA	PUFA	n-6	n-3
ปลาสาวย	13.69	4,254	5,256	3,285	1,174	2,111
ปลาหู	5.2	1,695	953	1,978	342	1,636
ปลาช่อน	4.33	1,324	859	1,608	556	1,052
ปลาอินทรี	4.05	1,615	864	1,079	197	882
ปลากะพงแดง	1.61	563	378	553	65	459
ปลาจาระเม็ด ขาว	2.58	1,174	585	539	110	430

“Low-Microbial” “Clean”
“Neutropenic” “Low-Bacteria” Diet

Food groups	Allowed	Not allowed
Dairy	All pasteurized milk and milk products, and yoghurt, commercially packaged cheese and cheese products made with pasteurized milk, pasteurized ice cream, commercial nutritional supplements and baby formulas	Unpasteurized or raw milk, cheese and yoghurt and other milk products, soft cheeses, cheeses from delicatessens; cheeses containing chili peppers or other uncooked vegetables; cheeses with molds
Meat and meat products	All well-cooked or canned meats, well-cooked eggs (boiled for 10 minutes), (white cooked firm with thickened yolk is acceptable); pasteurized egg substitutes, commercially packaged salami, bologna, and other luncheon meats, shellfish	Raw or uncooked meat, tofu, precooked cold meats, hard dured salami in natural wrap, pickled fish, tempeh, products containing raw egg
Bread and cereal products	All wrapped breads, bagels, rolls, muffins, pancakes, sweet rolls, waffles, potato chips, corn chips, pretzels, popcorn, cooked pasta, rice, and other grains (all must either be used 24 hours, or frozen and used as required)	Raw grain products, unwrapped bread and rolls, cakes, pastries, cakes with cream, dried fruits, nuts or coconut
Entrees, soups	Freshly prepared all cooked entrees, soups	All miso products, reheated canned or home-made soup
Fruits and nuts	Canned and frozen fruit (except for berry fruits), fruit juices; well-washed and peeled fresh fruit*; canned or bottled roasted nuts, commercially packaged peanut butter	Unwashed and unpeeled raw fruits, damaged fruit, berry fruits (strawberries, raspberries, blackberries), grapes (unless peeled), unroasted raw nuts, roasted nuts in the shell, unpasteurized fruit juice dried fruits,
Vegetables	All cooked, frozen, canned, or fresh vegetables and potatoes., well washed raw vegetables*, dried herbs and spices (packaged) (if added before; not after cooking)	Unwashed raw vegetables or herbs, salad from delicatessens; commercial salsas stored in refrigerated case, dried pulses (e.g. beans, chick peas and lentils), herbs and spices should not be sprinkled on food after cooking
Beverages	Tap water, cooled boiled water, commercial bottled distilled, spring, and natural water; all canned, bottled, powdered beverages, instant and brewed coffee, tea; brewed herbal teas using commercially packaged	Well water (unless tested yearly and found safe), cold-brewed tea made with warm or cold water; unpasteurized fruit and vegetable juices,
Desserts	Refrigerated commercial and homemade cakes, pies, pastries, cookies, and pudding	Unrefrigerated, cream-filled pastry products (not shelf stable)
Fats	Oil, shortening; refrigerated lard, margarine, butter; commercial shelf-stable mayonnaise and salad dressings (including cheese based salad dressings; refrigerated after opening); cooked gavy and sauces	Unwrapped or communally used butter, margarine, spreads or ghee, fresh salad dressings containing aged cheese or raw eggs, stored in refrigerated case
Other	Salt (packaged), granulated sugar, brown sugar, jam, jelly, syrups (refrigerated after opening); pasteurized honey (commercially packaged), catsup, mustard, pickles, olives (refrigerated after opening), candy, gum (in the hospital setting, individual portions of sugar; jam, marmalade, or honey) (pepper: in the hospital setting this should be irradiated)	Raw or unpasteurized honey; herbal and nontraditional nutrient supplements, brewers's yeast if eaten uncooked,

* If neutrophil count is <1500 mm³: consumption of raw vegetables is not allowed.

** Shelf-stable refers to unopened canned, bottled, or packaged food products that can be stored before opening at room temperature; container may require refrigeration after opening.



Food groups	Allowed	Not allowed
Dairy	All pasteurized milk and milk products, and yoghurt, commercially packaged cheese and cheese products made with pasteurized milk, pasteurized ice cream, commercial nutritional supplements and baby formulas	Unpasteurized or raw milk, cheese and yoghurt and other milk products, soft cheeses, cheeses from delicatessens; cheeses containing chili peppers or other uncooked vegetables; cheeses with molds
Meat and meat products	All well-cooked or canned meats, well-cooked eggs (boiled for 10 minutes), (white cooked firm with thickened yolk is acceptable); pasteurized egg substitutes, commercially packaged salami, bologna, and other luncheon meats, shellfish	Raw or uncooked meat, tofu, precooked cold meats, hard dured salami in natural wrap, pickled fish, tempeh, products containing raw egg
Bread and cereal products	All wrapped breads, bagels, rolls, muffins, pancakes, sweet rolls, waffles, potato chips, corn chips, pretzels, popcorn, cooked pasta, rice, and other grains (all must either be used 24 hours, or frozen and used as required)	Raw grain products, unwrapped bread and rolls, cakes, pastries, cakes with cream, dried fruits, nuts or coconut
Entrees, soups	Freshly prepared all cooked entrees, soups	All miso products, reheated canned or home-made soup

Fruits and nuts Canned and frozen fruit (except for berry fruits), fruit juices; well-washed and peeled fresh fruit*; canned or bottled roasted nuts, commercially packaged peanut butter

Vegetables All cooked, frozen, canned, or fresh vegetables and potatoes,, well washed raw vegetables*, dried herbs and spices (packaged) (if added before; not after cooking)

Beverages Tap water, cooled boiled water, commercial bottled distilled, spring, and natural water; all canned, bottled, powdered beverages, instant and brewed coffee, tea; brewed herbal teas using commercially packaged

Unwashed and unpeeled raw fruits, damaged fruit, berry fruits (strawberries, raspberries, blackberries), grapes (unless peeled), unroasted raw nuts, roasted nuts in the shell, unpasteurized fruit juice dried fruits,

Unwashed raw vegetables or herbs, salad from delicatessens; commercial salsas stored in refrigerated case, dried pulses (e.g. beans, chick peas and lentils), herbs and spices should not be sprinkled on food after cooking

Well water (unless tested yearly and found safe), cold-brewed tea made with warm or cold water; unpasteurized fruit and vegetable juices,

Desserts	Refrigerated commercial and homemade cakes, pies, pastries, cookies, and pudding	Unrefrigerated, cream-filled pastry products (not shelf stable)
Fats	Oil, shortening; refrigerated lard, margarine, butter; commercial shelf-stable mayonnaise and salad dressings (including cheese based salad dressings; refrigerated after opening); cooked gravy and sauces	Unwrapped or communally used butter, margarine, spreads or ghee, fresh salad dressings containing aged cheese or raw eggs, stored in refrigerated case
Other	Salt (packaged), granulated sugar, brown sugar, jam, jelly, syrups (refrigerated after opening); pasteurized honey (commercially packaged), catsup, mustard, pickles, olives (refrigerated after opening), candy, gum (in the hospital setting, individual portions of sugar; jam, marmalade, or honey) (pepper: in the hospital setting this should be irradiated)	Raw or unpasteurized honey; herbal and nontraditional nutrient supplements, brewers's yeast if eaten uncooked,

Evidence

Bone Marrow Transplantation (2017) **52**, 506–513

© 2017 Macmillan Publishers Limited, part of Springer Nature. All rights reserved 0268-3369/17

www.nature.com/bmt

REVIEW

Revisiting nutritional support for allogeneic hematologic stem

transplant-related mortality and relapse risk. Some trials found enteral nutrition (EN) to be as effective as parenteral nutrition (PN) with lower complication rates. In addition, EN was associated with better survival, less acute GvHD and faster neutrophil recovery. A neutropenic diet was not superior regarding overall survival, but in contrast resulted in higher infection risk. Current moderate quality studies show negative associations of malnutrition and clinical outcomes, with EN being superior to PN. There was no benefit of neutropenic diets. Large, randomized controlled studies are needed to better understand optimal nutritional support in this patient population.

based on a predefined case report form and assessed bias. Out of 459 potential abstracts, 13 studies of mostly moderate quality with a total of 18 167 patients were included. Two very large trials reported negative associations of malnutrition and survival, transplant-related mortality and relapse risk. Some trials found enteral nutrition (EN) to be as effective as parenteral nutrition (PN) with lower complication rates. In addition, EN was associated with better survival, less acute GvHD and faster neutrophil recovery. A neutropenic diet was not superior regarding overall survival, but in contrast resulted in higher infection risk. Current moderate quality studies show negative associations of malnutrition and clinical outcomes, with EN being superior to PN. There was no benefit of neutropenic diets. Large, randomized controlled studies are needed to better understand optimal nutritional support in this patient population.

Bone Marrow Transplantation (2017) **52**, 506–513; doi:10.1038/bmt.2016.310; published online 9 January 2017

Safe Cooking Methods

- The cooking time should be sufficient to achieve a core temperature of 70°C
- Pressure cooker

Special Food Service

- Food can be provided as needed

Buying Food: Always check “use by” dates. Avoid buying food near its “use by” date and never consume it after this date.

Do not buy foods in damaged packaging, e.g. dented cans or torn/crushed packets

Storing Food Store raw and cooked food separately Keep raw meat, fish and eggs in containers at the bottom of the fridge.

Check fridge and freezer are at the correct temperature. The fridge should be below 5°C, the freezer below 18°C.

Preparing and Cooking Food: Wash hands thoroughly in hot, soapy water before and after handling food. It is also important to wash hands between handling raw food and cooked food.

Keep kitchen surfaces and equipment scrupulously clean. Make sure that any item which comes into contact with food (knives, spoons, chopping boards, etc.) is as clean as possible and free from cracks or food encrustation. Metal spoons and ceramic chopping boards are preferable to wooden ones.

Ensure that canned food is clean. Wash cans before opening and also wash the can opener in hot, soapy water before use. Ring-pull cans are suitable but do not use cans which have to be opened with a key.

Do not use a microwave oven for cooking food. It can be used for heating food or defrosting frozen food.

Keep cold foods cold and hot foods hot. Cold foods should be kept in a fridge until needed. Hot foods should be served as soon as they are cooked.

Never reheat food which has already been heated.

Never refreeze thawed frozen food.

Avoid using food used communally, e.g. tubs of butter or spread, large cartons of ice-cream, or jars of jam or marmalade. Keep small supplies separately for your own use.

Eating Out: It is safer to avoid eating and drinking outside the home while on a “clean” food diet, as there is always a risk that strict food hygiene measures may not have been observed.

If eating out is unavoidable ensure that you: never eat foods listed as unsuitable, e.g. salads, shellfish. Note that some types of fast foods, e.g. burger buns with seeds, are not suitable.

Only consume foods from reputable restaurants or outlets, not street traders.

Never eat barbecued food.

American Cancer Society Nutrition Guidelines

- Eat variety of healthy foods with an emphasis on plant sources
- Eat > 5 serving of a variety of vegetables and fruits everyday
- Eat whole grain rather than refined (processed) grains and sugars. ½ of grain intake should be whole grains
- Limit consumption of red meats, especially those high in fat, and processed meats
- Consume 3 cups a day of fat-free or low-fat or equivalent milk products
- Limit exposure to the aflatoxins in foods
- Limit or avoid salt and salt-preserved foods
- Avoid very hot drinks. Avoid foods that are very hot in temperature
- Maintain a healthy weight throughout life

Summary

- Screening and Assessment Nutritional Status
- Calculation, Order, and Monitors
- Immunonutrients: glutamine, omega-3 etc.
- Food safety

Thank You

Any Questions?