



Standards for Specialized Nutrition Support (Parenteral Nutrition)

彰化基督教醫院營養部
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Introduction

- ✿ In critically ill patients, **malnutrition** is associated with impaired immune function, impaired ventilatory drive, and weakened respiratory muscles, leading to prolonged ventilatory dependence and **increased infectious morbidity and mortality**.
- ✿ **Malnutrition** is prevalent in intensive care unit (ICU) patients, has been reported as being as high as **40%**, and is associated with increased morbidity and mortality.

Introduction

- ✿ The **benefits of nutrition support** in the critically ill include improved wound healing, a decreased catabolic response to injury, improved gastrointestinal (GI) structure and function, and improved clinical outcomes, including a reduction in complication rates and length of stay, with accompanying cost savings. *However, nutrition support is not without adverse effects or risks.*
- ✿ The use of nutrition support in ICUs has been shown to vary from 14% to 67% of all patients in the ICU. Recent surveys report the **use of PN ranging from 12% to 71%** and the use of EN ranging between 33% and **92% of patients receiving nutrition support in the ICU.**



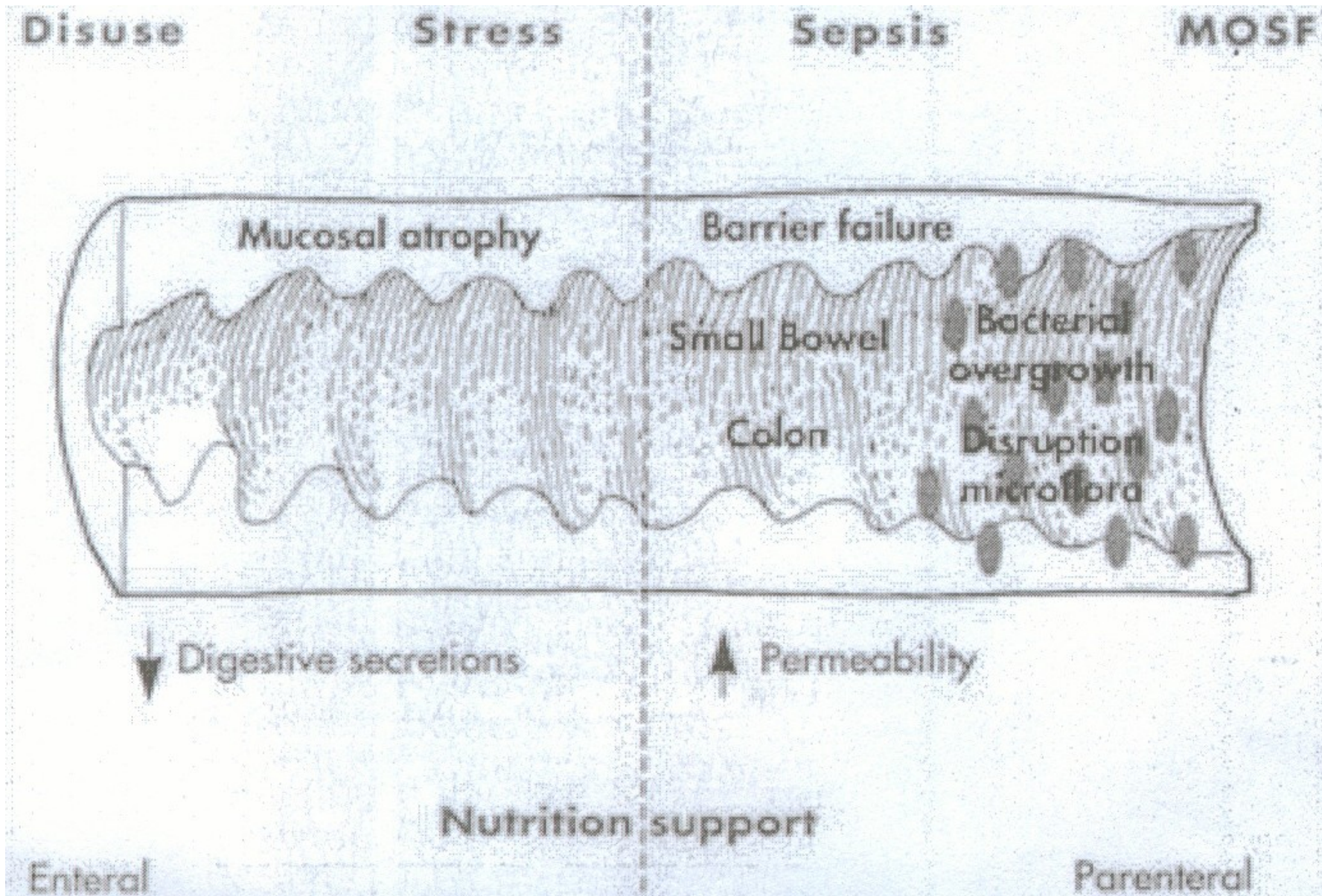
Nutrition Support Service

- ⚡ Function to assess and manage patients determined to be nutritionally at risk.
 - Improved patient outcomes.
 - Decreased length of hospitalization
 - Improved cost effectiveness

ASPEN 2002

Specialized Nutrition Support Administration

- ☀ Enteral nutrition or Parenteral nutrition
 - Khursheed N Jeejeebhoy. Total parenteral nutrition: potion or poison? American Journal of Clinical Nutrition 74(2): 160-163, 2001
 - Woodcock NP, Enteral v.s. parenteral nutrition: a pragmatic study. Nutrition 17(1): 1-12, 2001



Theory of the benefits of enteral nutrition

⚡ Prevents mucosal atrophy ?

Table TPN and intestinal atrophy in humans

Human studies have not shown any intestinal atrophy with complete bowel rest and TPN, even 1 mo after the withdrawal of food by mouth.

Groos et al, 1996

enteral nutrition for ≥ 10 d

Atrophy after 7-12 wk of TPN



Theory of the benefits of enteral nutrition

Prevents bacterial translocation ?

Bacterial translocation was identified by culturing the same organism in the blood as in the intestine and the mesenteric lymph nodes.

There is little evidence in humans that TPN causes atrophy of the intestinal mucosa and that EN prevents bacterial translocation.

TPN or EN

Moore et al, 1992

only 2 of 132 p'ts had translocation

Enteral Versus Parenteral Nutrition: A Pragmatic Study

Nicholas P. Woodcock, FRCS, Dietmar Zeigler, FRCS, M. Diane Palmer, BSc, RGN,
Paul Buckley, FRCA, Charles J. Mitchell, FRCP,
and John MacFie, MD, FRCS

From the Combined Gastroenterology Unit, Scarborough Hospital, Scarborough, UK

Controversy persists as to the optimal means of providing adjuvant nutritional support. The aim of this study was to compare enteral nutrition (EN) and parenteral nutrition (TPN) in terms of adequacy of nutritional intake, septic and nonseptic morbidity, and mortality. This was a prospective pragmatic study, whereby the route of delivery of nutritional support was determined by the attending clinician's assessment of gastrointestinal function. Patients considered to have inadequate gastrointestinal function were given TPN (group 1), while those deemed to have a functioning gastrointestinal tract received EN (group 2). Patients in whom there was reasonable doubt as to the adequacy of intestinal function were randomized to receive either TPN (group 3) or EN (group 4). The trial setting was a large district general hospital with a dedicated nutrition team. A total of 562 patients were included in the study (331 males; median age 67 y). Gastrointestinal function on entry into the study was considered inadequate in 267 patients who were given TPN (group 1) and adequate in 231 whom received EN (group 2). There was clinical uncertainty about the adequacy of gut function in 64 patients (11.4%) who were randomized to receive either TPN (group 3, 32 patients) or EN (group 4, 32 patients). The incidence of inadequate nutritional intake was significantly higher in group 4 compared with group 3 (78.1% versus 25%, $P < 0.001$). Complications related to the delivery system and other feed-related morbidity were significantly more frequent in both EN groups compared with the respective TPN groups. EN was associated with a higher overall mortality in both nonrandomized and randomized patients. There were no significant differences observed in the incidences of septic morbidity between patients receiving TPN and those given EN. EN is associated with a higher incidence of inadequate nutritional intake, complications related to the delivery system, and other feed-related morbidity than TPN. There is no evidence from this study to support a difference between the two modalities in terms of septic morbidity. Patients in whom there is reasonable doubt as to the adequacy of gastrointestinal function should be fed by the parenteral route. *Nutrition* 2001;17:1-12. ©Elsevier Science Inc. 2001

Key words: enteral nutrition, parenteral nutrition, morbidity, nutritional support, gut function

Adjuvant nutritional support indicated
Inadequate oral intake for 7 days

562 patients

Assessment of GI function

Clinically certain
498 patients
(88.6%)

Clinically uncertain
64 patients
(11.4%)

Inadequate
GI function

Adequate
GI function

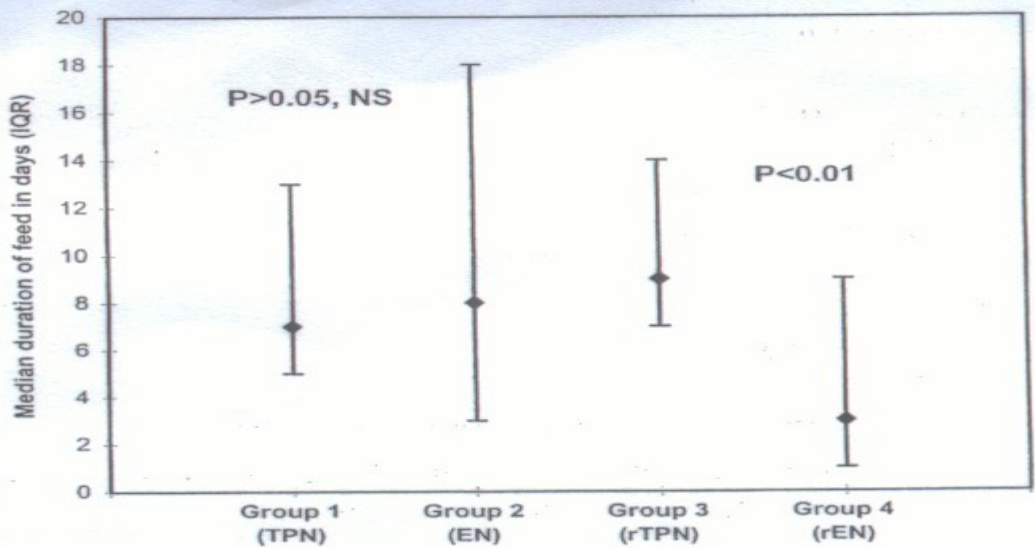
Randomised

TPN (Group 1)
267 patients

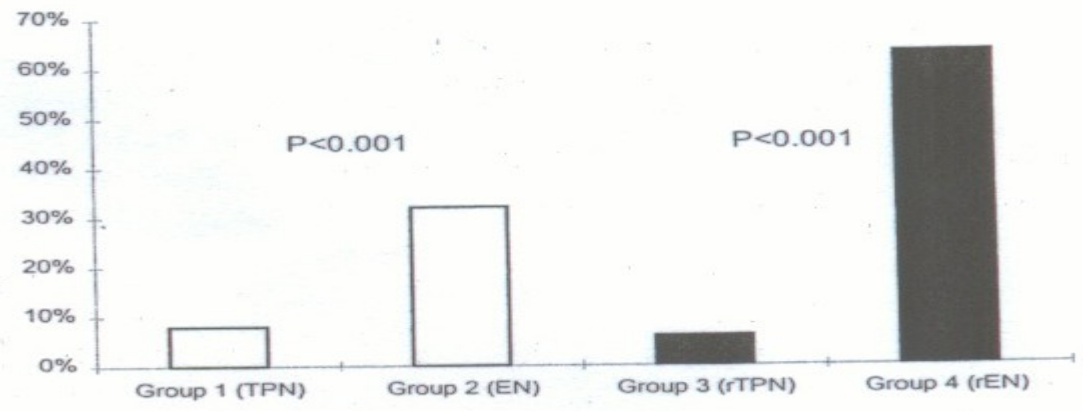
EN (Group 2)
231 patients

rTPN (Group 3)
32 patients

rEN (Group 4)
32 patients



A



B

FIG. 3. Adequacy of nutritional intake. (A) Duration of feeding by designated route; (B) percentage of patients receiving less than 80% of target intake.

TABLE IV.

| INCIDENCE OF SEPTIC MORBIDITY | | | |
|-------------------------------------------------------------|------------------------|-------------------|-------------------|
| | Nonrandomized patients | | |
| | Group 1 (TPN) | Group 2 (EN) | <i>P</i> value |
| Incidence of septic complications | 84/267 (31.5%) | 81/231 (35.1%) | 0.48, NS |
| Mean no. of complications per patient (\pm SEM) | 0.44 \pm 0.05 | 0.45 \pm 0.05 | >0.05, NS |
| Mean no. of complications per infected patient (\pm SEM) | 1.40 \pm 0.07 | 1.30 \pm 0.07 | >0.05, NS |
| | Randomized patients | | |
| | Group 3 (rTPN) | Group 4 (rEN) | <i>P</i> value |
| Incidence of septic complications | 16/32 (50%) | 10/32 (31.3%) | 0.13, NS |
| Mean no. of complications per patient (\pm SEM) | 0.75 \pm 0.16 | 0.41 \pm 0.12 | >0.05, NS |
| Mean no. of complications per infected patient (\pm SEM) | 1.50 \pm 0.16 | 1.30 \pm 0.15 | >0.05, NS |

EN, enteral nutrition; rEN, randomized EN; TPN, parenteral nutrition; rTPN, randomized TPN.

TABLE V.

| SEPTIC MORBIDITY IN RELATION TO NUTRITIONAL STATUS | | | |
|-------------------------------------------------------------------------|------------------------|-------------------|-------------------|
| | Nonrandomized patients | | |
| | Group 1 (TPN) | Group 2 (EN) | <i>P</i> value |
| Well nourished or mild/ moderately malnourished (NRI \geq 83.5) | 31/108 (28.7%) | 54/134 (40.2%) | 0.06, NS |
| Severely malnourished (NRI <83.5) | 41/124 (33.1%) | 20/64 (31.3%) | >0.5, NS |
| | Randomized patients | | |
| | Group 3 (rTPN) | Group 4 (rEN) | <i>P</i> value |
| Well nourished or mild/ moderately malnourished (NRI \geq 83.5) | 6/16 (37.5%) | 4/14 (28.6%) | >0.5, NS |
| Severely malnourished (NRI <83.5) | 10/15 (66.7%) | 5/15 (33.3%) | 0.07, NS |

EN, enteral nutrition, NRI, nutritional risk index; rEN, randomized EN; TPN, parenteral nutrition; rTPN, randomized TPN.

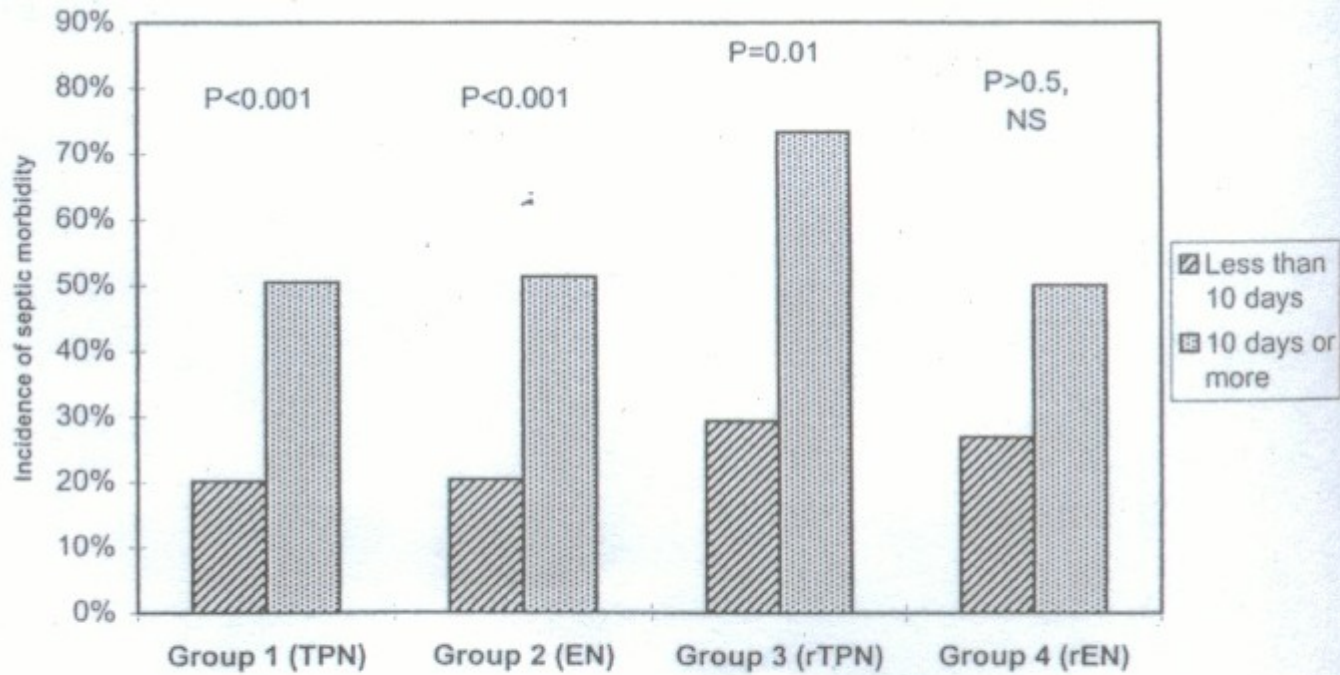


FIG. 4. Septic morbidity in relation to duration of feeding.

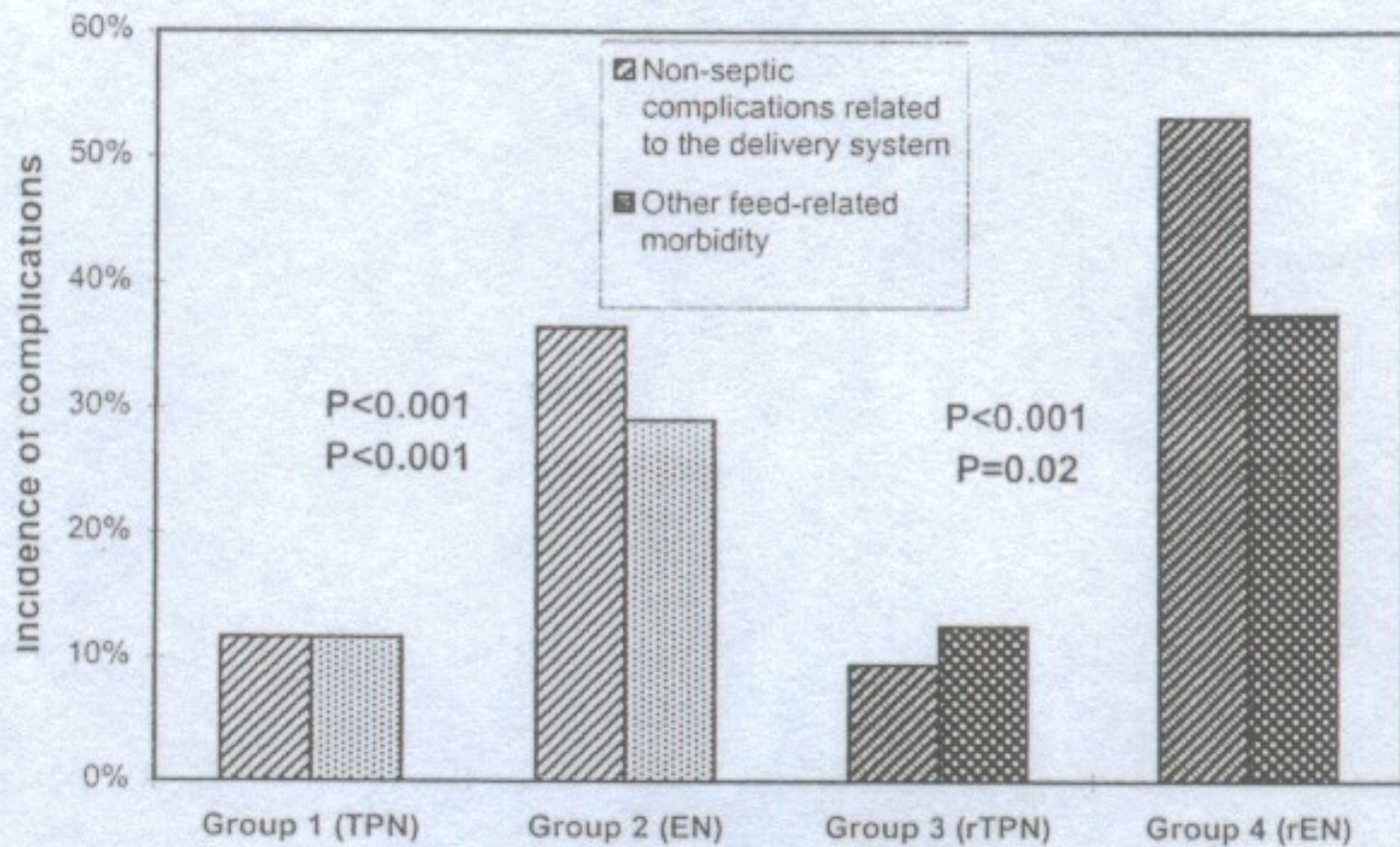


FIG. 6. Other complications.

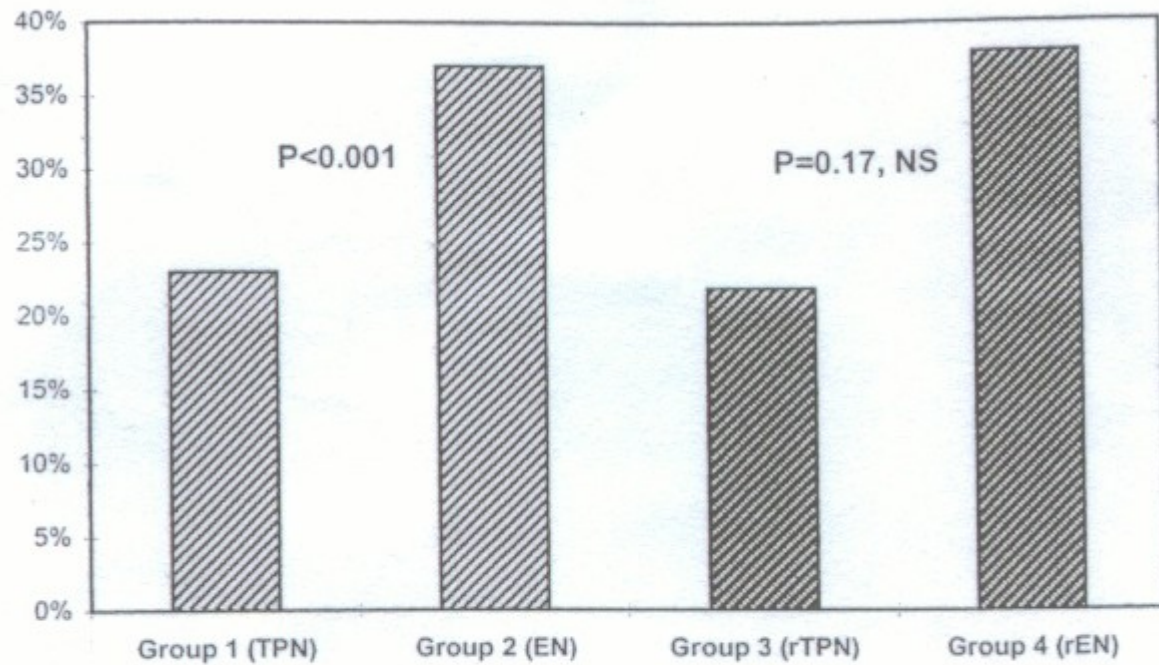


FIG. 7. Overall mortality rates.



Conclusion

- ✿ TPN undertaken by experienced teams does not cause more complications than does EN.
- ✿ When indicated because of the inability to give EN, TPN is beneficial in the treatment of malnutrition but is not a cure for all illnesses.

Specialized Nutrition Support Administration

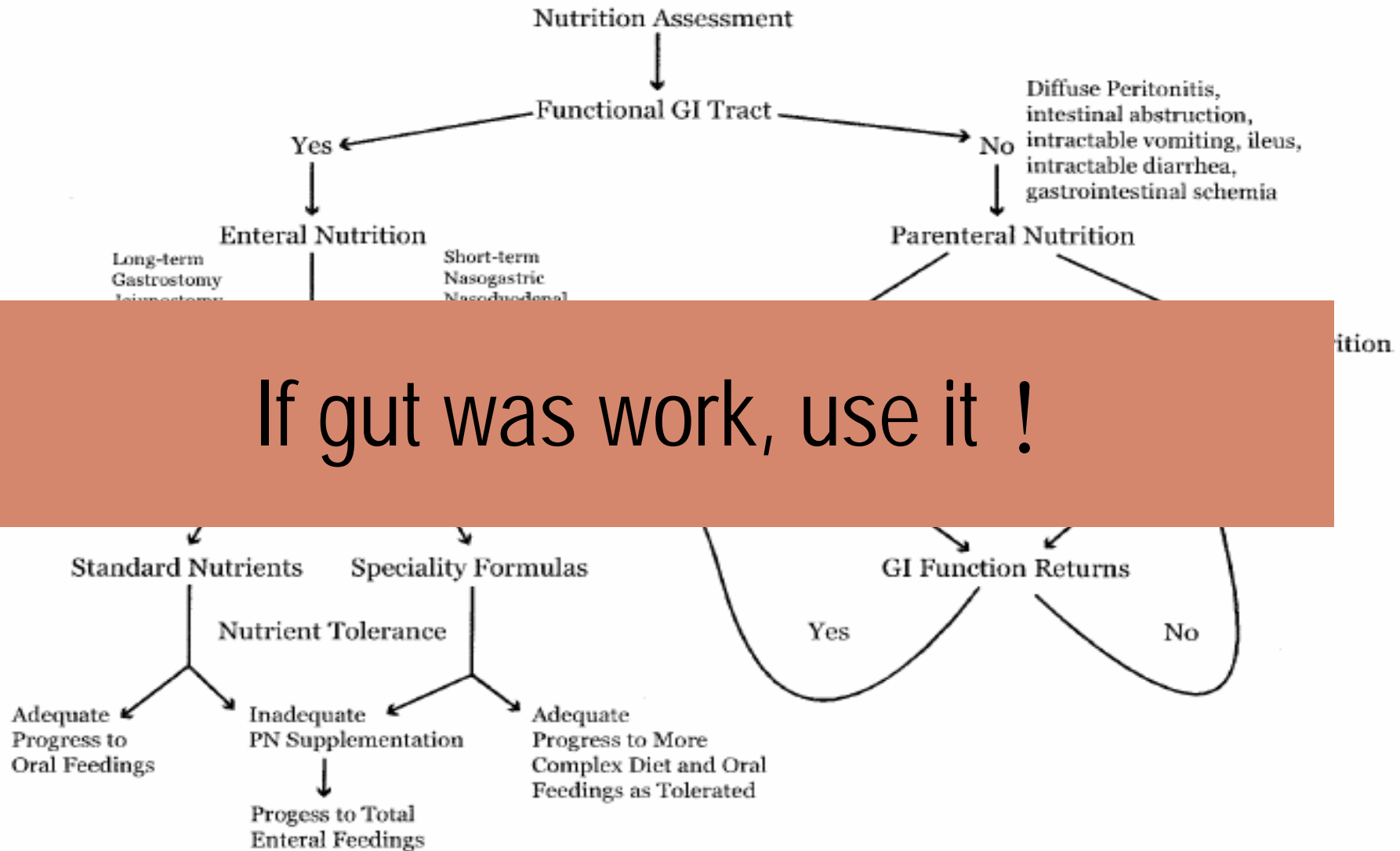


FIG. 2. Route of Administration of Specialized Nutrition Support² (Taken from the A.S.P.E.N. Clinical Pathways and Algorithms for Delivery of Parenteral and Enteral Nutrition Support in Adults).



Relative Contraindications to Early Enteral Feeding

- ⚠ Small bowel ileus
- ⚠ Bowel obstruction
- ⚠ Intra-abdominal sepsis
- ⚠ Necrotizing pancreatitis
- ⚠ High-output gastrointestinal fistulas
- ⚠ Short-bowel syndrome

Table 16. Recommendations for the Use of Parenteral Nutrition or Protein-Sparing Therapy in Various Clinical Conditions

| Type of nutritional support ^a | Nutritional status of patient ^b | Expected resumption of oral/enteral nutrition ^c | Clinical condition | Evidence from RCTs ^d | | | | | Recommendation ^e | |
|------------------------------------------|--------------------------------------------|------------------------------------------------------------|---------------------------|---------------------------------|-------------------|--------------------------------|----------------|----------------|-----------------------------|----------------|
| | | | | Benefit | Effect not likely | Effect may/ may not be present | Harm | No RCTs | | |
| IPN | Not severe malnutrition | ≤14 days | Perioperative: | | | | | | | |
| | | | Prop UGI cancer | + | | | | | B ^f | |
| | | | Other | | | | | | D | |
| | | | Oncologic: | | | | | | | |
| | | | Chemo/radiation therapy | | | | + | | E | |
| | | | BMT | | | + | | | C ^g | |
| | | | Liver disease: | | | | | | | |
| | | | Alcoholic hepatitis | | + | | | | D | |
| | | | Other | | | | | + | C ^g | |
| | | | Pancreatitis: | | | | | | | |
| | | | Ranson < 2 | | | | + | | E | |
| | | | Ranson ≥ 2 | | | | | + | C ^g | |
| | | | IBD: | | | | | | | |
| | | | UC | | + | | | | D | |
| | | | Crohn's disease | | + | | | | D | |
| | | | Pediatric: | | | | | | | |
| | | | LBW infants with IEF | | + | | | | D | |
| | | | LBW infants without IEF | | | | | | + | A ^f |
| | | | Other | | | | | | + | C |
| | | | AIDS | | + | | | | | D |
| | | | Chronic pulmonary disease | | + | | | | | D |
| | | | Renal failure: | | | | | | | |
| | | | Acute | | | | | | + | C ^g |
| Chronic | | | | | | + | C ^g | | | |
| Critically ill: | | | | | | | | | | |
| Burn injury | | | | | ++ | | E | | | |
| Trauma | | + | | | | | D | | | |
| Respirator-bound | | + | | | | | D | | | |
| Other | | | | | | + | C ^g | | | |
| Other conditions | | | | | | + | C ^g | | | |
| Short/insufficient bowel: | | | | | | | | | | |
| <1 months life expectancy | | | | | | | + | A ^f | | |
| <3 months life expectancy | | | | | | | + | E | | |
| Other | | | | | | + | C ^g | | | |
| Preoperative | | | | | | ++ | B | | | |
| Other | | | | | | + | C ^g | | | |
| Perioperative | | | | + | | | D | | | |
| Alcoholic hepatitis | | | | + | | | D | | | |
| Hepatic encephalopathy | | | | ++ | | | B ^f | | | |
| LBW infants with IEF | | | | + | | | D | | | |
| Pancreatitis—Ranson < 2 | | | | + | | | D | | | |
| Other | | | | | | + | C ^g | | | |

Not severe malnutrition
Expected resumption of enteral nutrition ≤ 14days

Prop UGI cancer → B

LBW infants without IEF → A

Not severe malnutrition
Expected resumption of enteral nutrition > 14days

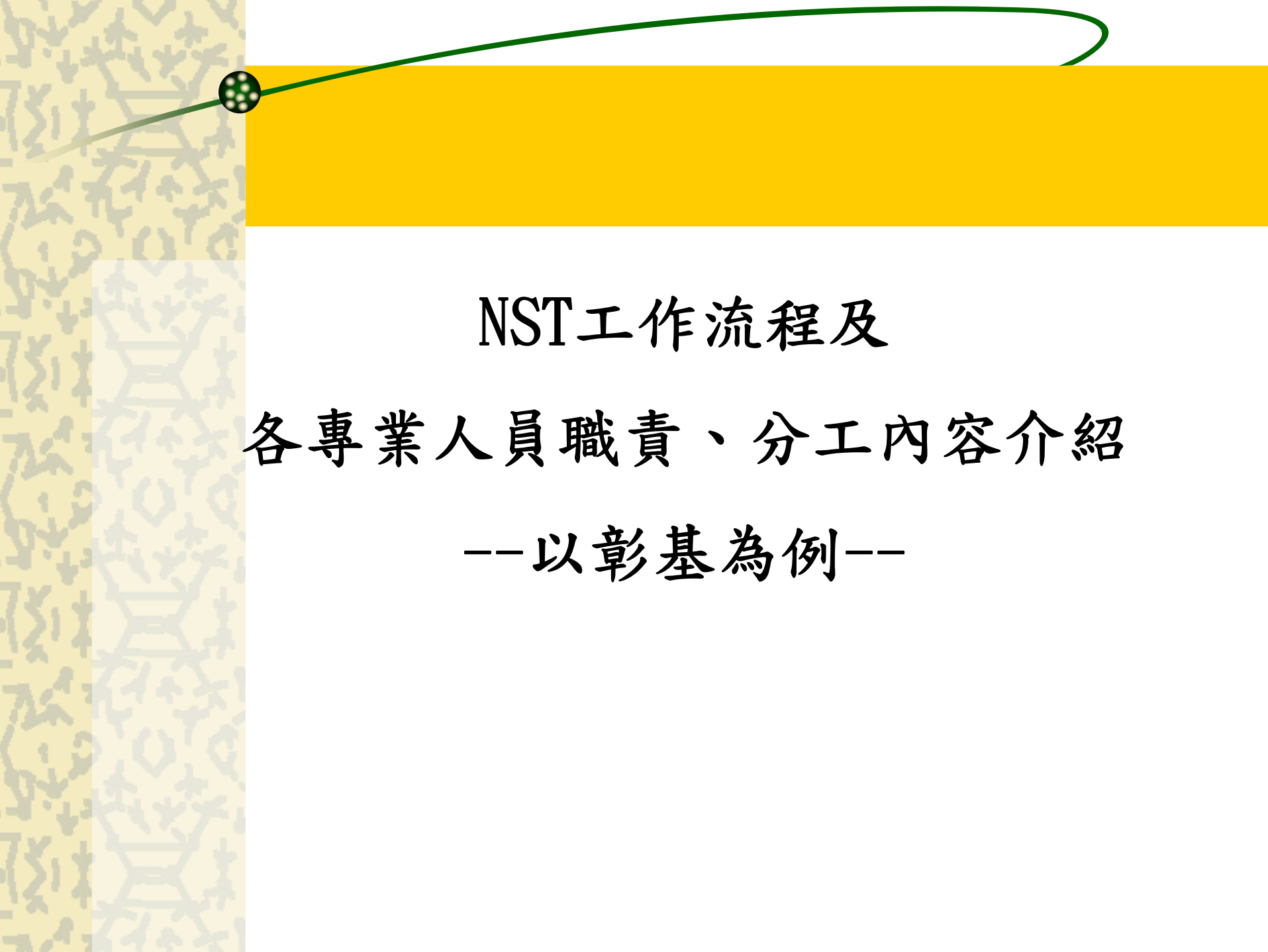
Short bowel > 3 mo life expectancy → A

Severe malnutrition
Expected resumption of enteral nutrition: not applicable

preoperative → B

Reducing Mortality and Morbidity Rates with Parenteral Nutrition

- ☀ PN can improve the clinical outcome **in some conditions** in which malnutrition and inflammatory stress coexist, especially **p't with anorexia, malabsorption, or bowel dysfunction**.
 - Major trauma
 - Major burns
 - Head injury
 - Sepsis syndrome
 - Major general surgical procedures in moderately to severely malnourished p't
 - Major abdominal or thoracic surgery in moderately to severely malnourished p't
 - Major abdominal or thoracic surgery for cancer in moderately to severely malnourished p't
 - Acute hepatic encephalopathy
 - ARF
 - BMT
 - AIDS



NST工作流程及
各專業人員職責、分工內容介紹
--以彰基為例--

靜脈營養支持小組工作流程

臨床醫師經由電腦彰基2000會診系統進入—TPN 會診

電腦連線通知靜脈營養支持小組及營養部並列印會診單

營養評估

靜脈營養支持小組護理師及營養師

與臨床醫師、CNSS醫師溝通了解病情及營養需求

靜脈營養支持

腸道營養支持


CNSS醫師根據營養評估開立醫囑

給予腸道營養並追蹤評估

專職藥師調配處方

完成會診

定期追蹤訪視並作營養評估與監測



靜脈營養支持小組會診系統

| | | | | | |
|----------------|-------------|--------------------------|-------|---------|-------|
| 病歷號：10771898 | 姓名： | 性別：M | 年齡：51 | 選取患者(Q) | 離開(E) |
| 住院帳號：700212193 | 床號：K SIC 03 | 入院日期：93/1/19 上午 11:07:21 | | | |
| 主治醫師：62980 鄭清源 | | 診 斷：1 578.91 上胃腸道出血 | | 編輯狀態：新建 | |

確認

會診資料 | 歷史資料

| | | |
|------------------|-------------|----------|
| CNSS Dr. : 24744 | 許格豪 | 主述內容： |
| 會診醫師：62980 | 鄭清源 | |
| 會診日期：93/ 2/12 | 下午 05:38:53 | |
| 身 高： | 公分 | |
| 實際體重： | 公斤 | 理想體重： 公斤 |

主述內容：

急項檢驗：(照會前需開立)

| 檢驗名稱 | 結果值 | 單位 | 開立日期 | 收費碼 | 檢序 |
|---------------------------------------------------|-----|-------|------|--------|----|
| <input checked="" type="checkbox"/> Glucose: AC | | mg/dL | | FBIGAC | 6 |
| <input checked="" type="checkbox"/> Total Protein | | 群項 | | FBIAG | 6 |
| <input checked="" type="checkbox"/> Prealbumin | | mg/dL | | FBIPAB | 6 |
| <input checked="" type="checkbox"/> Transferrin | | mg/dL | | FBITRA | 6 |
| <input checked="" type="checkbox"/> Bilirubin D | | mg/dL | | FBIBID | 6 |
| <input checked="" type="checkbox"/> Bilirubin T | | mg/dL | | FBIBIT | 6 |
| <input checked="" type="checkbox"/> GOT(AST) | | U/L | | FBIGOT | 6 |
| <input checked="" type="checkbox"/> GPT(ALT) | | U/L | | FBIGPT | 6 |
| <input checked="" type="checkbox"/> Alk-P-tase | | U/L | | FBIALK | 6 |

財團法人彰化基督教醫院
臨床營養醫療支援小組
會診單(成人)
CONSULTATION SHEET(ADULT)

病歷號碼: 16006581 性別: 女
姓名: XXXXXXXXXX
床號: K-650 年齡: 64

病情摘要:

Request 臨床營養醫療支援小組 Consultation

Diagnosis: 2 518.81 呼吸衰竭 3 686 皮膚及皮下組織之其他局部感染
6 401.9 自發性高血壓, 未明示為惡性或良性 8 599.0 泌尿道感染, 未明示位置者
10 996.62 其他血管裝置物、種植及移植所致之感染及發炎反應 11 569.83 腸穿孔
13 558.9 其他及未明示之非傳染性胃腸炎及大腸炎 14 709.2 疤痕病態及皮膚纖維化

Clinical Summary:

The 64 y/o female patient is a case of enterocutaneous fistula, ischemia bowel post op, DM with medical control. This time she admitted to our ward due to wound poorly care due to a lot of discharge from endtrocutaneous fistula, and we need your excellent experience for further nutrition suport due to NPO, thanks a lot!!

Nutrition Assessment Required Data:

Height (Cm) Dept. 201 一般外科 Referred by Dr. 楊力衡
Actual wt. (Kg) IBW (Kg) or AdjBW 0(Kg) Date: 2004/2/13 上午 09:43:55

Role of Nutrition Support Team Members

🌟 Nurse

1. Be a **resource person** for patients, staff and local health care providers regarding parenteral nutrition therapy and central venous catheters.
2. **Monitor** quality care for parenteral nutrition therapy and central venous catheters.
3. Participate in the discharge planning and patient education of home parenteral nutrition therapy patients.
4. Follow-up with home parenteral nutrition therapy patients after discharge from the hospital.



Role of Nutrition Support Team Members

Dietitian

1. **Assess the nutritional status** of the patient and **determine nutritional needs.**
2. **Develop and implement a plan** of nutritional care based on assessment of needs.
3. Monitor and evaluate nutritional status on an ongoing basis and recommend changes as needed.
4. Educate patients, physicians, and other health professionals on types and methods of nutritional support for hospital and home use.

Management of Total Parenteral Nutrition

Indication for TPN

- Nonfunctional gastrointestinal tract
 - Small-bowel syndrome
 - Inflammatory bowel disease
 - Enterocutaneous fistula
 - Chronic intestinal Pseudo-Obstruction
 - Severe diarrhea
 - Severe malnutrition or severe catabolism
 - Severe GI toxicities associated with chemotherapy and radiation

Management of Total Parenteral Nutrition

☀ Indication for TPN

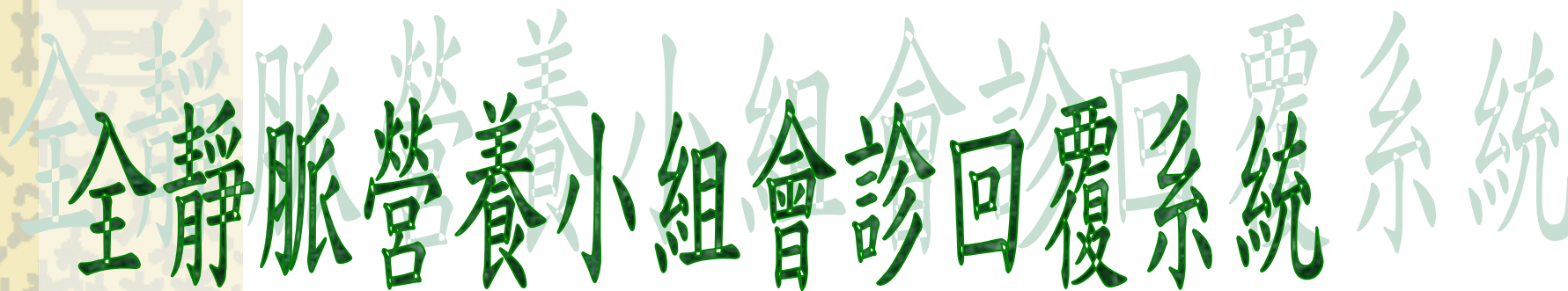


- Organ failure
 - Pancreatitis
 - Hepatic failure
 - Renal failure
 - Multiple organ failure
- Perioperation patient
- Anorexia nervosa
- Neonatal conditions
- Hyperemesis gravidarum



Role of Nutrition Support Team Members

Physician

1. **Indicate** whether the patient needs to have parenteral nutrition therapy.
2. **Assess** the patient and **order** appropriate nutrition and electrolytes needed for the patient after evaluating lab values.
3. Evaluate the patient for potential line infections.



全靜脈營養小組會診回覆系統



Nutritional Assessment

Registered dietitians will provide a nutritional assessment upon request. An assessment may include the following parameters:

1. Diet history includes information about weight change, food intake (if applicable), and nutritional support history.
2. Calculation of calories, protein, fat, and carbohydrate from all sources of nutrition support are made.



Nutritional Assessment

Registered dietitians will provide a nutritional assessment upon request. An assessment may include the following parameters:

3. Nutritional needs

- a. Basal energy needs are calculated from patient's weight, height, and age. Additional energy needs are based on an assessment of activity and metabolic needs.
- b. Protein needs are determined by the patient weight and metabolic state (e.g., burn, sepsis, renal disease)
- c. Fluid requirements are 30 — 35 cc/kg (average sized adults), or 25 cc/kg (65 years of age or older)

| | | | | | |
|-----------------|-----------------|---------------------------|-----------|---------|-------|
| 病歷號: 3845243 | 姓名: [REDACTED] | 性別: M | 年齡: 71 成人 | 選取患者(Q) | 離開(E) |
| 住院帳號: 700218002 | 床號: K 651 A | 入院日期: 93/2/10 下午 04:24:10 | | | |
| 主治醫師: 21591 張宏基 | 診斷: 1 151 胃惡性腫瘤 | | | | |

確定(Y)

評估資料1 | 評估資料2 | 配方及添加物 | 歷史資料 | FOCUS值

身高: 161 公分 理想體重: 57.07 公斤
 實際體重: 55 公斤 調整體重: 55 公斤

CNSS Dietitian: 31464 高振渾

由 CNSS 營養師填寫:

Triceps Skinfold 三頭肌皮下脂肪厚度 (TSF) 19 mm
 Midarm Circumference 上臂圍 (MAC) 26 cm
 肌肉臂圍 (MAMC) 20 cm
 Total Lymphocytes Count 淋巴球總數 (TLC) 1534 /mm³
 Creatinine Height Index (CHI) 0 %

Muscle Wasting 肌肉耗損 NONE

Fat Tissue Wasting 皮下脂肪耗損 NONE

Edema 水腫 NONE

Weight Change 24.6 % for 2 month year

Dietary History Caloric Intake 500 kcal/day for 2 week month

| | | | | | | | | | | |
|-------|-----------|-----|---------|-------------|---------------------|-----|----|----|---------|-------|
| 病歷號: | 3845243 | 姓名: | | 性別: | M | 年齡: | 71 | 成人 | 選取患者(Q) | 離開(E) |
| 住院帳號: | 700218002 | 床號: | K 651 A | 入院日期: | 93/2/10 下午 04:24:10 | | | | | |
| 主治醫師: | 21591 | 張宏基 | 診斷: | 1 151 胃惡性腫瘤 | | | | | | |

確定(Y)

評估資料1 | 評估資料2 | 配方及添加物 | 歷史資料 | FOCUS值

Consultant's Notes:

Daily Nutrient Requirement:

BEE 基礎能量需要量 kcal (Stress factor 壓力因子 Activity factor 活動因子)Total Calorie Requirement 總熱量需要量 kcalProtein Requirement 蛋白質需要量 g = * N: non-Protein Calorie 氮:非氮熱量: 1:

營養師建議:

patient has severe weight loss for >1.5 months and poor oral intake, we use TPN for preoperative nutrition support.



病歷號: 26155365 姓名: 性別: M 年齡: 56 成人
 住院帳號: 700332431 床號: K 613 C 入院日期: 2005/4/14 13:12:10
 主治醫師: 37599 陳自諒 診斷: 1 153.0 結腸右曲惡性

評估資料1 | 評估資料2 | 配方及添加物 | 歷史資料 | FOCUS值

配方

一般 第一天 第二天 cc數

配方別: TPN-H

TCR(總熱量需要量) 1960 kcal 1958 kcal

AMINOACID(氨基酸含量) 3.846 %

Dextrose(Dextrose含量) 18.1 %

糖: G/W-TPN 50%;500cc 50 %

脂肪: Lipovenoes MCT-TPN 20%;250ml 250 cc

蛋白質: AminoPLASMAL-TPN INJ 10%;500 10 %

醫師輸入:

INTRAFAT_QTY(脂肪輸液) 1 瓶

PROTEIN_QTY(蛋白質量) 80 g 73 g

建議糖需求 mg/kg/min

建議氮與非氮熱量比 1:

添加物

| CH | 名稱 | 劑量 | 劑單 | 上限值 | ▲ |
|----|--------------------------------|----|----|-----|---|
| | CALCIUM GLUCONATE-TPN 10%;10cc | | cc | 20 | |
| | 10cc INFUVITA-TPN | | cc | 0 | |
| | KCL-TPN 10cc | | cc | 40 | |
| | MGS04-TPN 2gm/20cc | | cc | 14 | |
| ▼ | MULTIVITA-TPN 2cc | 2 | cc | 0 | |
| | POTASSIUM PHOSPHATE-TPN 20cc | | cc | 6 | |
| | NACL-TPN 3%;500cc | | cc | 200 | |
| ▼ | TRACE ELEMENT-TPN 10cc | 2 | cc | 0 | |
| ▶ | VIT K1 10mg/cc | 10 | mg | 0 | |





Solutions and Additives



Lipids

- a. Used as a calorie source and to prevent fatty acid deficiency (4-10% of the total daily calories as linoleic acid is necessary to provide essential fatty acid supplementation) .
- b. Fat emulsions are available as a 10%LCT product which is 1.1 Kcal/cc and a 20% product which is 2.0 Kcal/cc (MCT/LCT=50:50) .
- c. Fat emulsions should not more than 60% of the total calorie input of the patient (even in the most immune compromised patients) .

病歷號: 26155365 姓名: 鄭明火 性別: M 年齡: 56 成人
 住院帳號: 700332431 床號: K 613 C 入院日期: 2005/4/14 13:12:10
 主治醫師: 37599 陳自諒 診斷: 1 153.0 結腸右曲惡性

選取患者(Q) 離開(E)

確定(Y)

評估資料1 | 評估資料2 | 配方及添加物 | 歷史資料 | FOCUS值

配方

一般 第一天 第二天 cc數

配方別: TPN-H
 TCR(總熱) Aminomix 1 INJ-TPN 1000cc 1958 kcal
 AMINOAC TPN-A
 Dextrose TPN-E
 糖: TPNF 1300ml/bot
 TPN-G 0 %
 脂肪: OTHERS
 Lipovenoes MCT-TPN 20%;250ml 250 cc
 蛋白質: AminoPLASMAL-TPN INJ 10%;500 10 %

醫師輸入: PPN

INTRAFAT_QTY(脂肪輸液) 1 瓶

PROTEIN_QTY(蛋白質量) 80 g 73 g

建議糖需求 mg/kg/min

建議氮與非氮熱量比 1:

添加物

計算

| CH | 名稱 | 劑量 | 劑單 | 上限值 |
|----|--------------------------------|----|----|-----|
| | CALCIUM GLUCONATE-TPN 10%;10cc | | cc | 20 |
| | 10cc INFUVITA-TPN | | cc | 0 |
| | KCL-TPN 10cc | | cc | 40 |
| | MGS04-TPN 2gm/20cc | | cc | 14 |
| √ | MULTIVITA-TPN 2cc | 2 | cc | 0 |
| | POTASSIUM PHOSPHATE-TPN 20cc | | cc | 6 |
| | NACL-TPN 3%;500cc | | cc | 200 |
| √ | TRACE ELEMENT-TPN 10cc | 2 | cc | 0 |
| ▶√ | VIT K1 10mg/cc | 10 | mg | 0 |

病歷號: 26155365 姓名: 鄭明火 性別: M 年齡: 56 成人
 住院帳號: 700332431 床號: K 613 C 入院日期: 2005/4/14 13:12:10
 主治醫師: 37599 陳自諒 診斷: 1 153.0 結腸右曲惡性

一般
 第一天
 第二天
 cc數

配方別: TPN-A

TCR(總熱量需要量) 1960 kcal 1958 kcal
 AMINOACID(氨基酸含量) 2.73 %
 Dextrose(Dextrose含量) 21.39 %

糖: G/W-TPN 50%;500cc 50 %
 脂肪: Lipovenoes MCT-TPN 20%;250ml 250 cc
 蛋白質: AminoPLASMAL-TPN INJ 10%;500 10 %
 醫師輸入: AminoPLASMAL-TPN INJ 10%;500cc
 AMINOPOLY-H-TPN INJ 7%;500cc PPN

INTRAFAT_QTY(脂肪輸液) 1 瓶
 PROTEIN_QTY(蛋白質量) 80 g 73 g

建議糖需求 mg/kg/min
 建議氮與非氮熱量比 1:

| CH | 名稱 | 劑量 | 劑單 | 上限值 |
|----|--------------------------------|----|----|-----|
| | CALCIUM GLUCONATE-TPN 10%;10cc | | cc | 20 |
| | 10cc INFUVITA-TPN | | cc | 0 |
| | KCL-TPN 10cc | | cc | 40 |
| | MGS04-TPN 2gm/20cc | | cc | 14 |
| √ | MULTIVITA-TPN 2cc | 2 | cc | 0 |
| | POTASSIUM PHOSPHATE-TPN 20cc | | cc | 6 |
| | NACL-TPN 3%;500cc | | cc | 200 |
| √ | TRACE ELEMENT-TPN 10cc | 2 | cc | 0 |
| ▶ | VIT K1 10mg/cc | 10 | mg | 0 |

病歷號: 26155365 姓名: 鄭明火 性別: M 年齡: 56 成人
 住院帳號: 700332431 床號: K 613 C 入院日期: 2005/4/14 13:12:10
 主治醫師: 37599 陳自諒 診斷: 1 153.0 結腸右曲惡性

一般
 第一天
 第二天

 cc數

配方別: TPN-A

TCR(總熱量需要量) 1960 kcal 1958 kcal

AMINOACID(氨基酸含量) 2.73 %

Dextrose(Dextrose含量) 21.39 %

糖: G/W-TPN 50%;500cc 50 %

脂肪: 10% 500cc G/W 250 cc

蛋白質: 10% 500cc G/W-TPN 10 %

G/W-TPN 50%-500cc

Nako No.5-TPN 500cc

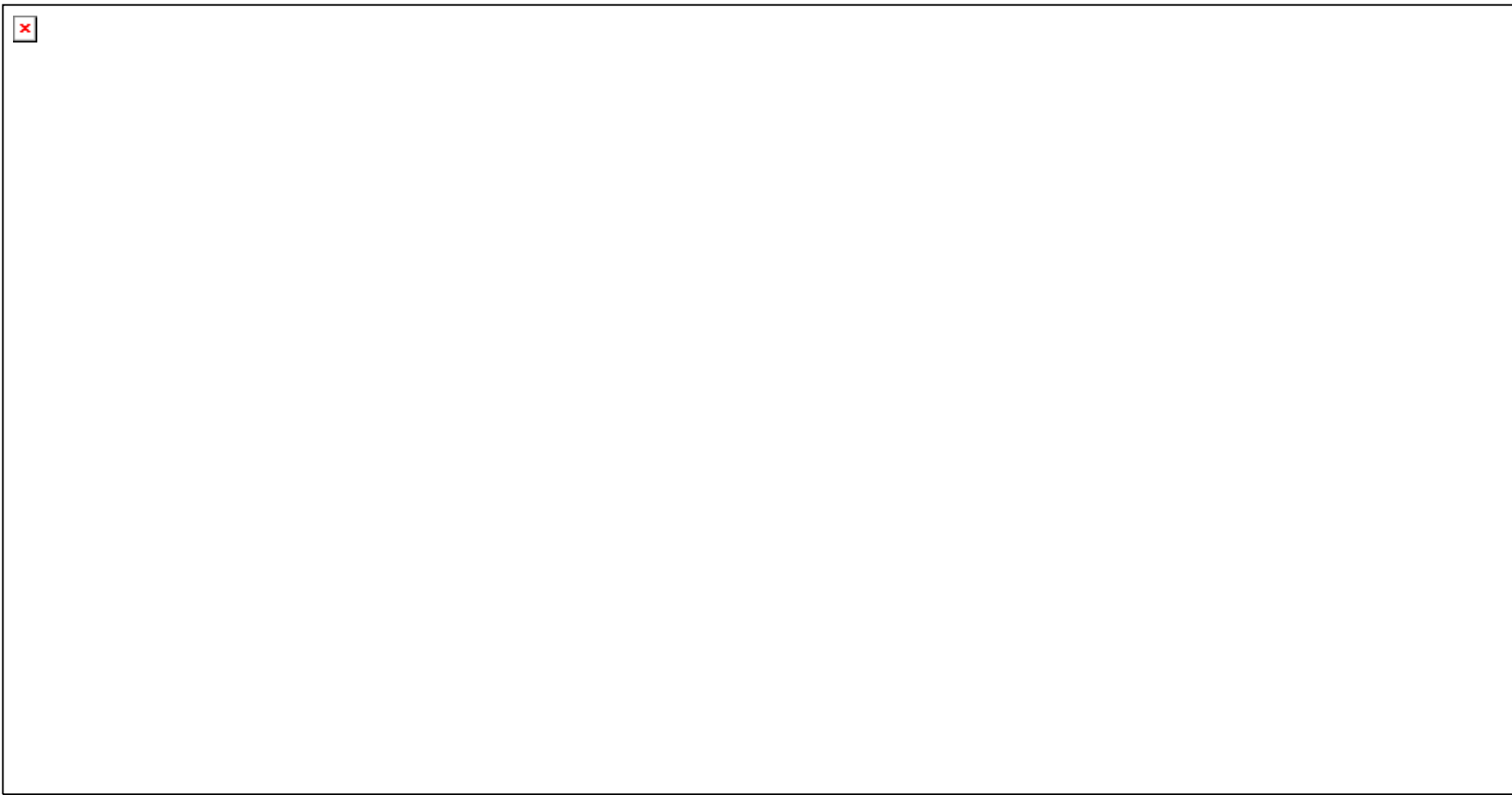
醫師輸入: INTRAFAT_QTY(脂肪輸液) 1 瓶

PROTEIN_QTY(蛋白質量) 80 g 73 g

建議糖需求 mg/kg/min

建議氮與非氮熱量比 1:

| CH | 名稱 | 劑量 | 劑單 | 上限值 |
|----|--------------------------------|----|----|-----|
| | CALCIUM GLUCONATE-TPN 10%;10cc | | cc | 20 |
| | 10cc INFUVITA-TPN | | cc | 0 |
| | KCL-TPN 10cc | | cc | 40 |
| | MGS04-TPN 2gm/20cc | | cc | 14 |
| √ | MULTIVITA-TPN 2cc | 2 | cc | 0 |
| | POTASSIUM PHOSPHATE-TPN 20cc | | cc | 6 |
| | NACL-TPN 3%;500cc | | cc | 200 |
| √ | TRACE ELEMENT-TPN 10cc | 2 | cc | 0 |
| ▶ | VIT K1 10mg/cc | 10 | mg | 0 |









病歷號: 3845243 姓名: 性別: M 年齡: 71 成人
 住院帳號: 700218002 床號: K 651 A 入院日期: 93/2/10 下午 04:24:10
 主治醫師: 21591 張宏基 診 斷: 1 151 胃惡性腫瘤

| | | |

配方

一般 第一天 第二天 cc數

配方別: TPNF 1300ml/bot

TCR(總熱量需要量) **2056** kcal 2081 kcal
 AMINOACID(氨基酸含量) **3.846** %
 Dextrose(Dextrose含量) **18.1** %

糖: G/W-TPN 50%;500cc 50 %
 脂肪: LIPOFUNDIN MCT/LCT-TPN 20%;2: 250 cc
 蛋白質: AMINOSYN-TPN INJ 10%;500cc 10 %

醫師輸入:

INTRAFAT_QTY(脂肪輸液) 瓶
 PROTEIN_QTY(蛋白質量) g g

建議糖需求 mg/kg/min
 建議氮與非氮熱量比 1:

添加物

CC數

計算一 cc

cc/hr*8hrs
 cc/hr*8hrs
 cc/hr*8hrs

計算二 cc
 cc/hr*12hrs
 cc/hr*12hrs

計算三 cc

Clinical application of parenteral nutrition



病歷號
住院帳號
主治醫師

frmAppraise 配方及計算公式

以糖為基準
 以蛋白質為基準
 強制
 取消
 確定
 取消

X = 總熱量 T = 配方數量 Y = 蛋白質 P = 外加量 Z = 患者所需葡萄糖克數

公式一 | 公式二 | OTHERS |

$$(X - (\text{脂肪瓶數} * \text{cc數} * 2) - (Y * 4)) / 3.4 = Z$$

$$(2081 - (1 * 250 * 2) - (79 * 4)) / 3.4 = 372$$

$$Y / \text{Amino Acid \%} = T(\text{ml})$$

$$79 / 3.846 \% = 2054$$

$$Z - T * \text{Dextrose\%} = G(\text{g})$$

$$372 - 2054 * 18.1 \% = 0$$

$$G / \%G/W = P(\text{ml})$$

$$0 / 50 \% = 0$$

實際供應熱量 79 *4+ 372 *3.4+ 250 *2= 2081 kcal
 蛋白質比 79 *4/ 2081 *100= 15.18 %
 糖比 372 *3.4/ 2081 *100= 60.77 %
 脂肪比 250 *2/ 2081 *100= 24.02 %
 Dextrose 372 / 55 /1440*1000= 4.69 mg/kg/min
 N: NPC 1: 140
 每小時cc數 2058 / 24 = 86 cc/hr

評估資料

配方

一般

配方別:

TCR(總素

AMINOAC

Dextros

糖:

脂肪:

蛋白質:

醫師輸入

INTRAF

PROTEIN

建議糖量

建議氮量

離開(E)

定(Y)

計算

限值

- 20
- 0
- 40
- 14
- 0
- 6
- 200
- 0
- 0

| | | | | | |
|-----------------|-----------------|---------------------------|-----------|---------|-------|
| 病歷號: 3845243 | 姓名: [REDACTED] | 性別: M | 年齡: 71 成人 | 選取患者(Q) | 離開(E) |
| 住院帳號: 700218002 | 床號: K 651 A | 入院日期: 93/2/10 下午 04:24:10 | | | |
| 主治醫師: 21591 張宏基 | 診斷: 1 151 胃惡性腫瘤 | | | | |

確定(Y)

評估資料1 | 評估資料2 | 配方及添加物 | 歷史資料 | FOCUS值

複製 刪除 停用 原因: Enteral nutrition 觀察中 MBD AAD HL 其他

| 序 | 類別 | 結案原因 | 異動時間 | 身高 | 實際體重 | 理想體重 | 想要體重 | 三頭肌皮下脂肪厚度 | 上臂圍 | 肉臂 |
|-----|-----|------|-------------|-----|------|-------|------|-----------|-----|----|
| 3 | 第一天 | | 02/11 15:26 | 161 | 55 | 57.07 | 55 | 19 | 26 | |
| 2 | 第二天 | | 02/11 15:26 | 161 | 55 | 57.07 | 55 | 19 | 26 | |
| ▶ 1 | 一般 | | 02/11 15:24 | 161 | 55 | 57.07 | 55 | 19 | 26 | |

| 項目 | 建議項目 | 建議量 | 類別 |
|-----|-------------------|------|----|
| ▶ 1 | TPNF | 2054 | F |
| 2 | G/W-TPN | 0 | G |
| 3 | LIPOFUNDIN MCT/LC | 250 | I |
| 4 | AMINOSYN-TPN INJ | 0 | P |
| 5 | MULTIVITA-TPN | 2 | A |
| 6 | TRACE ELEMENT-TPN | 2 | A |

營養師建議

patient has severe weight loss for >1.5 months and poor oral intake, we use TPN for preoperative nutrition support.

Role of Nutrition Support Team Members

Pharmacist

1. **Assess** the stability and the compatibility of the parenteral nutrition solution.
2. **Assist** the physician in initiating, maintaining, and monitoring the therapy's affect on the patient's metabolic condition.
3. Provide educational programs on select parenteral nutrition topics.
4. Assist in the coordination and arrangement of home therapy prescriptions.

財團法人彰化基督教醫院
臨床營養醫療支援小組
會診單(成人)
CONSULTATION SHEET (ADULT)

病歷號碼: 16006581 性別: 女
姓名:
床號: K-SIC-11 年齡: 64

病情摘要:

Request 臨床營養醫療支援小組 Consultation

Diagnosis: 2 518.81 呼吸衰竭

6 401.9 自發性高血壓, 未明示為惡性或良性

10 996.62 其他血管裝置物、種植及移植物所致之感染及發炎反應 11 569.83 腸穿孔

13 558.9 其他及未明示之非傳染性胃腸炎及大腸炎 14 709.2 疤痕病態及皮膚纖維化

3 686 皮膚及皮下組織之其他局部感染

8 599.0 泌尿道感染, 未明示位置者

Clinical Summary:

The 64 y/o female patient is a case of enterocutaneous fistula, ischemia bowel post op. DM with medical control. This time she admitted to our ward due to wound poorly care due to a lot of discharge from endtrocutaneous fistula, and we need your excellent experience for further nutrition suport due to NPO, thanks a lot!!

Nutrition Assessment Required Data:

Height 146(Cm)

Actual wt. 48(Kg) IBW 46.94(Kg) or AdjBW 48(Kg)

Dept. 201 一般外科 Referred by Dr. 楊力衡

Date: 2004/2/13 上午 09:43:55

回覆內容:

Nutrition Assessment Parameter:

Total lymphocytes count(TLC) 330 (/mm³)

Creatinine height index (CHI) 53 (%)

Muscle wasting mild-moderate

Fat tissue wasting mild-moderate

Edema mild-moderate

Dietary history caloric intake 1500 (kcal/day) for 1 month

Consultant's Notes:

Daily Nutrient Requirement:

BEE 1078 kcal (Stress factor 1.5 Activity factor 1.2)

Total caloric requirement 1860 (kcal)

Protein requirement 56 (g)

N: non-protein caloric: 1:183

Nutrition Support Suggestion:

Enterocutaneous fistula case with GI bleeding, now she can't use enteral feeding, so we use TPN for nutrition support.

CNSS Dietitian: 廖婉如

Date: 2004/2/13 下午 04:06:48

Nutritional Order:

Consultation indicator:

- Moderate stress when enteral diet is not expected to resume in 7 days
- Enterocutaneous fistula /Enteric anastomotic leakage

Method:

- Parenteral Nutrition
- Central

主治醫師
王淑惠
20870

CNSS Physician:

Date: 2004/2/13 下午 04:06:48

General recommendations for TPN monitoring



Role of Nutrition Support Team Members

🌟 Nurse

1. Be a resource person for patients, staff and local health care providers regarding parenteral nutrition therapy and central venous catheters.
2. **Monitor** quality care for parenteral nutrition therapy and central venous catheters.
3. Participate in the discharge planning and patient education of home parenteral nutrition therapy patients.
4. Follow-up with home parenteral nutrition therapy patients after discharge from the hospital.



Role of Nutrition Support Team Members

Dietitian

1. Assess the nutritional status of the patient and determine nutritional needs.
2. Develop and implement a plan of nutritional care based on assessment of needs.
3. **Monitor and evaluate** nutritional status on an ongoing basis and recommend changes as needed.
4. Educate patients, physicians, and other health professionals on types and methods of nutritional support for hospital and home use.

病歷號: 6348809 姓名: 性別: F 年齡: 66 成人
 住院帳號: 700070854 床號: K 701 入院日期: 2002/7/12 上午 08:03:09
 主治醫師: 61303 于振東 診 斷:

評估資料1

| | |
|-----|----|
| 序 | 值 |
| ▶ 1 | YY |

說明

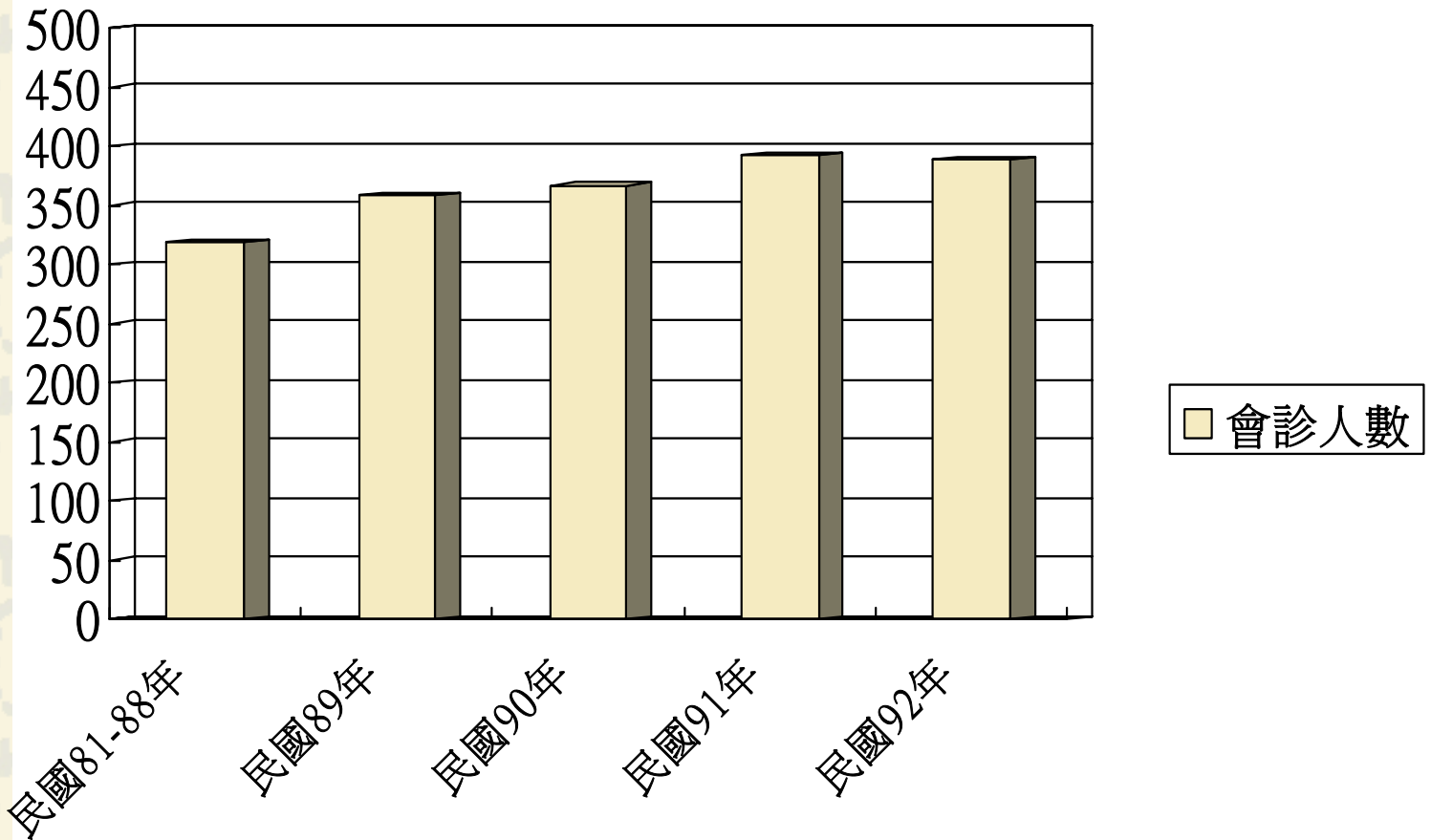
| CH | 值 | FOCUS描述 | 說明 | 形成時間 |
|----|----|---------|----|------|
| | YY | TTT | | |
| ▶ | GG | GGGERRR | | |

FOCUS值



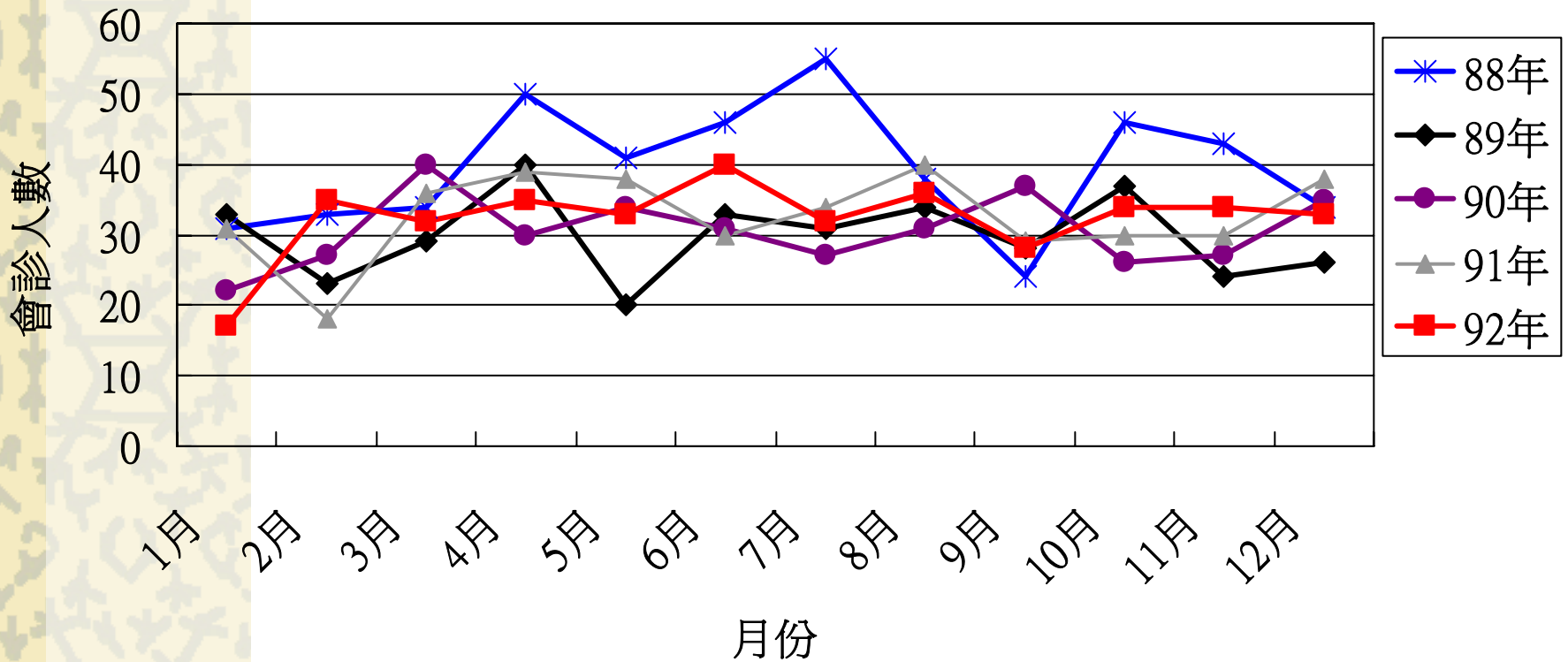
彰基執行TPN現況分享

民國八十九年醫學中心成立後，重症急患人數增加，因而會診靜脈營養支持小組人數也陸續增加。

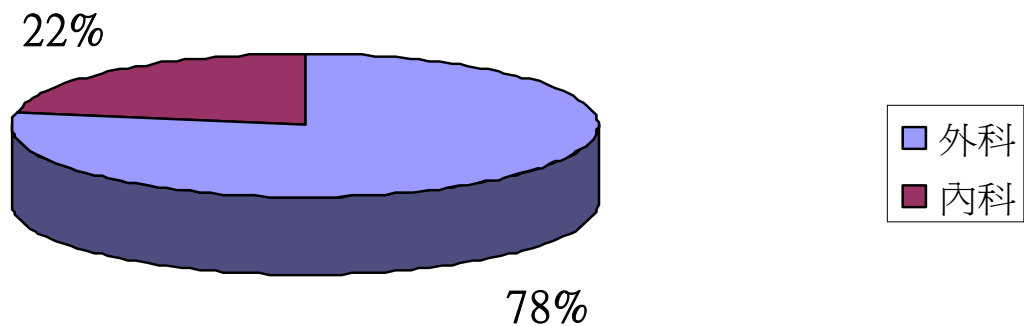


民國92年2月份開始起用電腦照會與回覆系統，總接案數416人/年；共計7251人日數/年

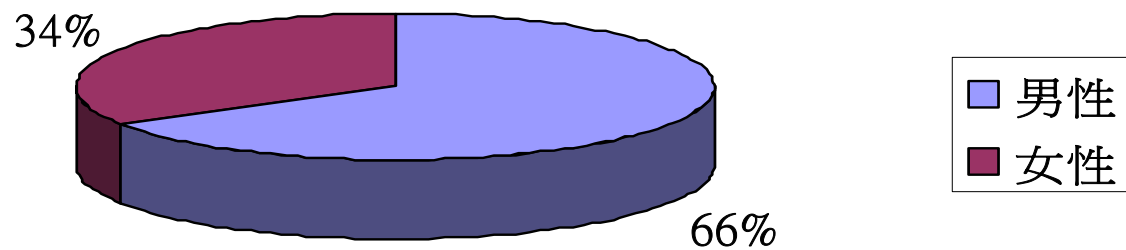
平均每日案數為27.5人日數/天



成人全靜脈營養支持小組內外科人數分布狀態

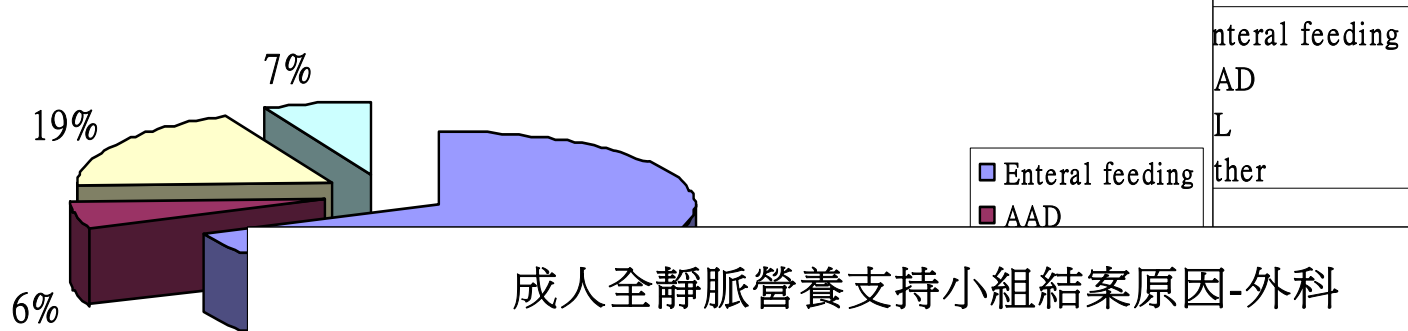


成人全靜脈營養支持小組男女性分佈狀態

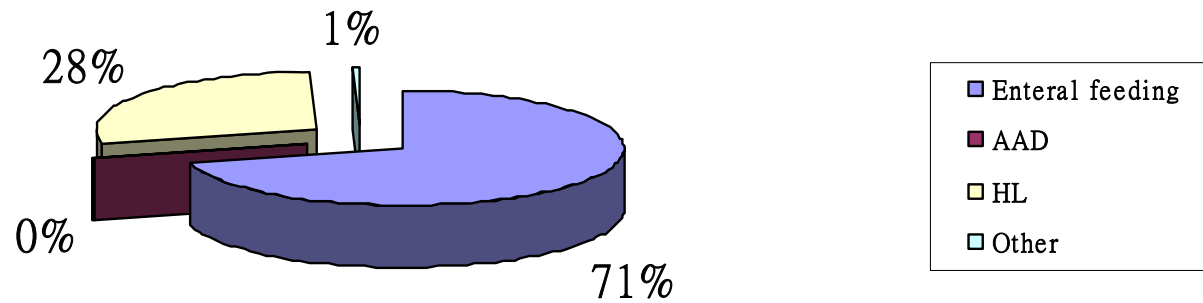


成人全靜脈營養支持小組結案原因

成人全靜脈營養支持小組結案原因-內科



成人全靜脈營養支持小組結案原因-外科





Total Parenteral Nutrition indicator

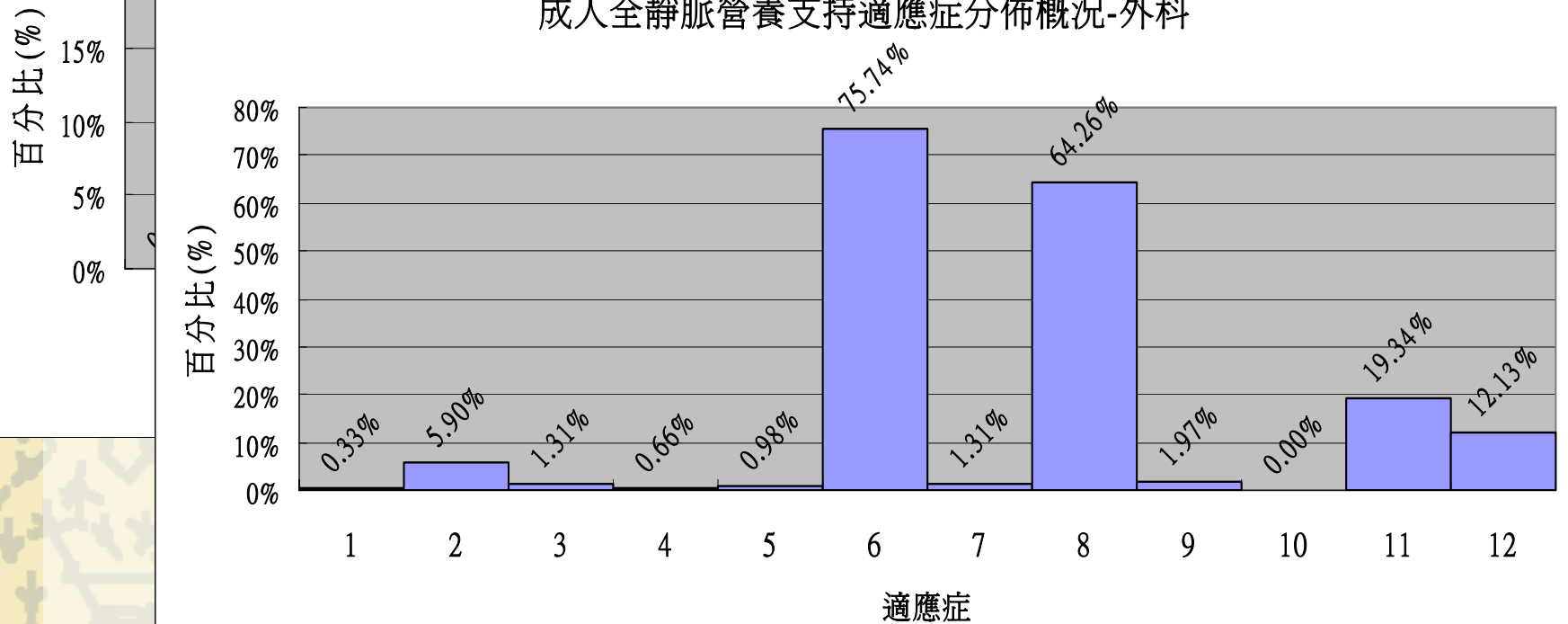
1. Enterocutaneous fistula /Enteric anastomotic leakage
2. Hyperemesis gravidarum
3. Inability to absorb nutrients via the gastrointestinal tract
4. Inflammatory bowel disease when bowel rest for 2-4 weeks is indicated
5. Intractable diarrhea
6. Major surgery when adequate enteral intake is not expected to resume within 7-10 days
7. Massive bowel resection(SBS)
8. Moderate stress when enteral diet is not expected to resume in 7 days
9. Moderate to severe acute pancreatitis
10. Patients undergoing high-dose antineoplastic therapy(Chemotherapy/Radiotherapy)
11. Severe catabolism with or without malnutrition when the gastrointestinal tract is nonfunctional for 5-7 days
12. Severe malnutrition with a temporary(5-7 days) nonfunctional tract

成人全靜脈營養適應症分布狀態

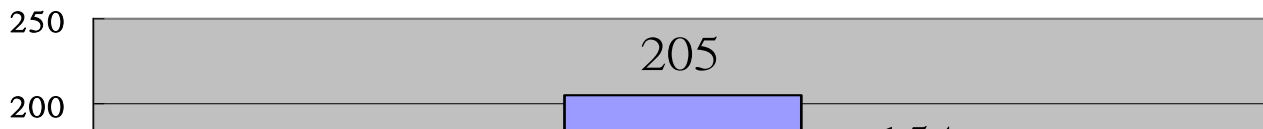
成人全靜脈營養支持適應症分佈概況-內科



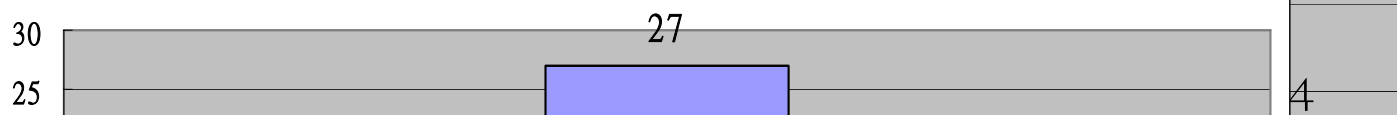
成人全靜脈營養支持適應症分佈概況-外科



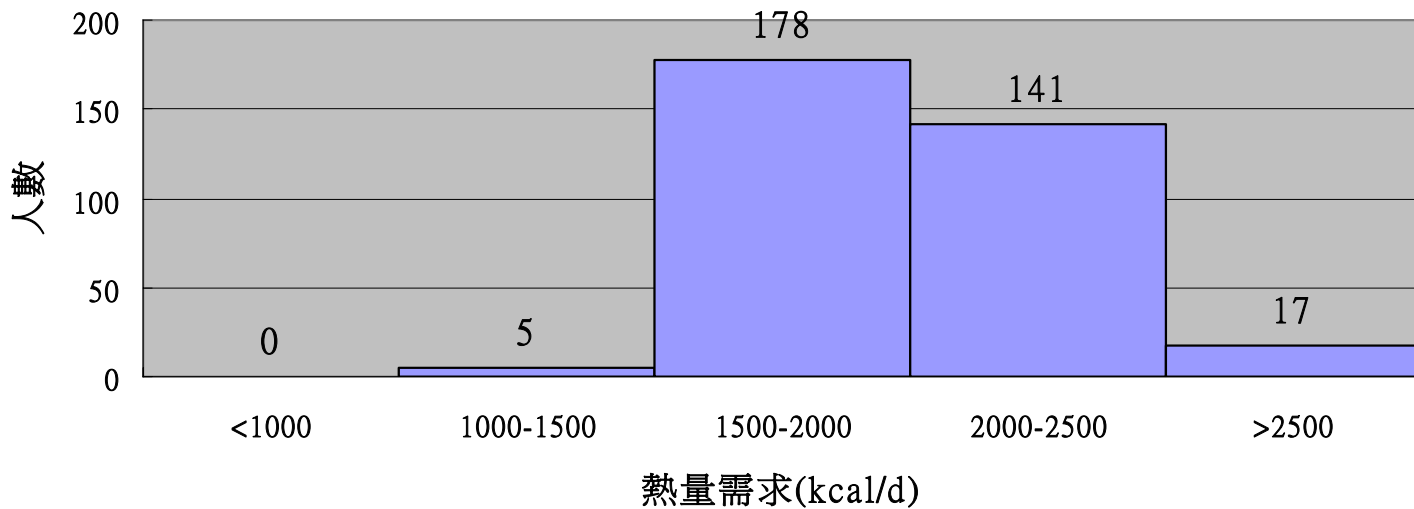
成人全靜脈營養熱量需求狀態



成人全靜脈營養支持熱量需求概況-內科



成人全靜脈營養支持熱量需求概況-外科



人數

人數

熱量需求(kcal/d)



THANKS FOR YOUR
ATTENTION