شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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يجب أن

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15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

ENTERAL VERSUS COMBINED ENTERAL AND PARTIAL PARENTERAL NUTRITION IN CRITICALLY ILL PEDIATRIC PATIENTS ON MECHANICAL VENTILATION.

THESIS

Submitted in partial fulfillment for the requirements of M.D. degree in

Pediatrics

By

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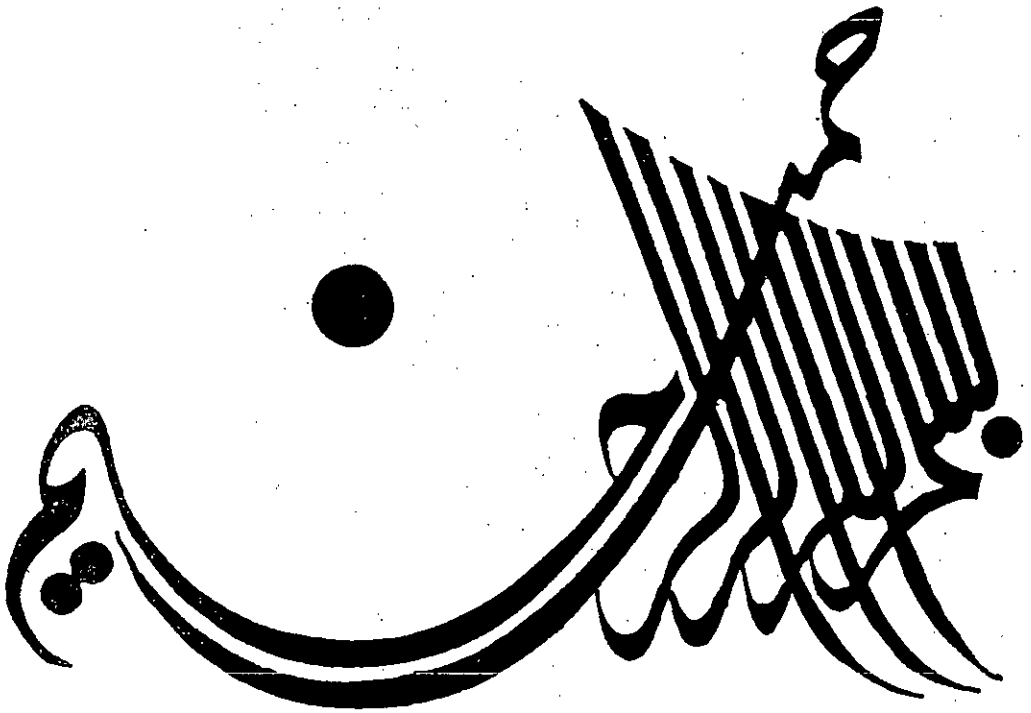

قالوا سبحانك لا علم لنا إلا ما علمتنا
إنك أنت العليم الحكيم

صدق الله العظيم
(٣٢ / البقرة)

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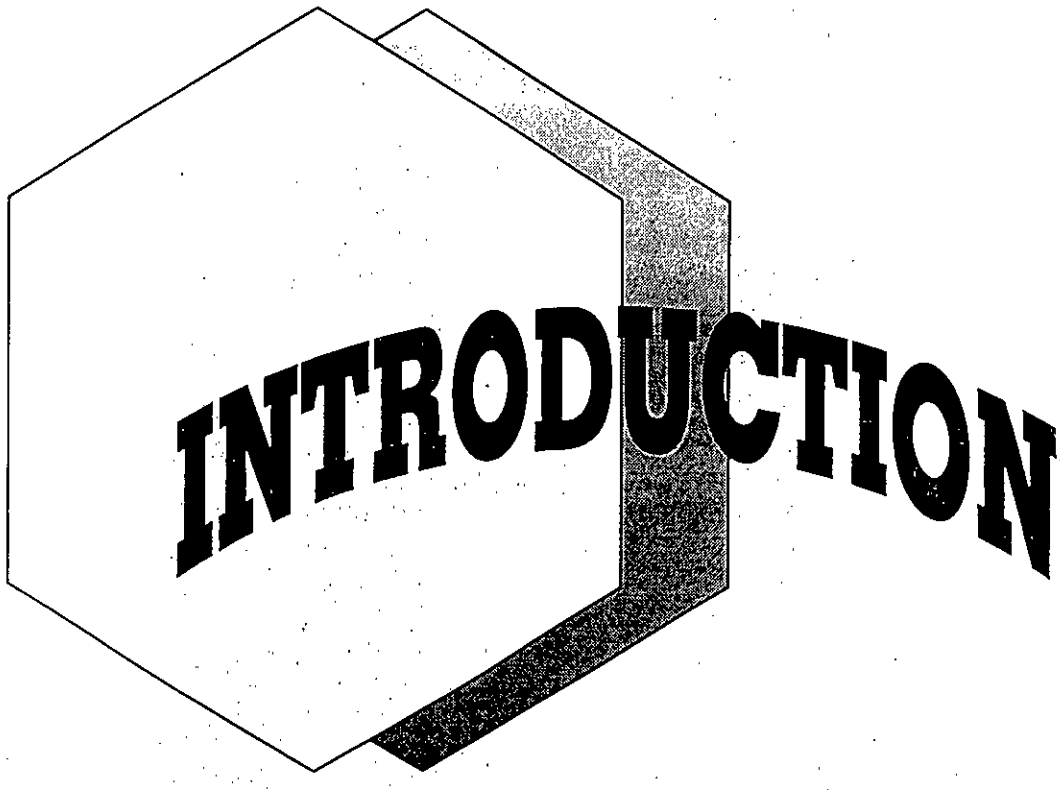
CONTENTS

List of abbreviations

SGPT	Serum glutamic pyruvic transaminase	MAC	Mid arm circum-ference
SGOT	Serum glutamic oxalacetic transaminase	MAMC	Mid arm muscle circumference
TLC	Total lymphocytic count	TSF	Triceps skinfold.
CHI	Creatinine height index	kcal	Kilo calorie.
MOSF	Multiple organ system failure	NAR	Nitrogen appearance rate
UAR	Urea appearance rate	BUN	Blood urea nitrogen
GI	Gastro intestinal.	IV	Intravenous.
GIT	Gastrointestinal tract	RQ	Respiratory qutioent
CRF	Chronic renal failure	ARF	Acute renal failure
ICU	Intensive Care Unit.		
PICU	Pediatric intensive care unit	ESLD	End stage liver disease
TNF	Tumor necrosis factor	IL	Interleukin.
GABA	Gamma amino butyric acid	CTZ	Chemoreceptor trigger zone
PEM	Protein energy mal-nutrition.	LDH	Lactate dehydrogenase
EAR	Estimated average requirements	RDA	Recommended dietary allowances
CVC	Central venous catheter	UL	Upper level
PN	Parenteral nutrition	AI	Adequate intake
TPN	Total parenteral nutrition.	BCAA	Branched chain aminoacids
REE	Resting energy expenditure	AAA	Aromatic aminoacids
BEE	Basal energy expenditure	EAA	Essential aminoacids
TEF	Thermic effect of food	BMR	Basal metabolic rate
CHD	Congenital heart diseases	MCT	Medium chain triglycerides
CHF	Congestive heart failure	VLDL	Very low density lipoprotein
LCT	Long chain triglycerides		


INTRODUCTION

Introduction

Acute respiratory failure is a term used to describe an inability to maintain gas exchange. It is the end result of failure of oxygenation or ventilation or both [1] . In acute respiratory failure, the resting energy expenditure increase to 25% due to increase work of breathing although most of increase is abolished by mechanical ventilation [2] . Both injury and sepsis have similar effects on the metabolism of nutrients and often occur together [3] . Critically ill and injured patients are severely catabolic and hypermetabolic and thus lose significant body mass daily [4] . Limited body stores of essential nutrients places the critically ill child at increased risk for the development of ill effects caused by under-nutrition e.g. weight loss, growth retardation, fluid and electrolytes imbalance, compromised immune competence, muscle fatigue and poor wound healing [5] .

Nutritional support of critically ill child signifies the provision of their nutrient substrates during an interruption in the normal process of ingestion, absorption or utilization of food staffs [6] . The critically ill child is particularly prone to the development of protein-energy malnutrition [7] . The feeding techniques in intensive care units used for the critically ill patients are : Total parenteral nutrition , combined enteral and parenteral , combined oral and parenteral, combined oral and enteral and oral feeding [8] . The successful treatment of critically ill children requires an understanding of how the child responds to stress and starvation [9] .

Nutritional requirements In normal and critical conditions

The primary goal of nutritional support is to meet the body energy requirements for metabolic process and tissue repair [8] .The nutritional requirements of the child are influenced by the rate of growth ,body composition and composition of new growth .Also nutrients requirements are different during the acute phase of critical illness compared with the latter convalescent phase being lower in the former [6] .

The Food and Nutrition Board in 1989 has revised the identified appropriate dietary allowance for a number of substances that prevent deficiency states in most persons *(Table 1)* .They are currently re-examining ranges of requirements [10] . The Food and Nutrition Board in 1997 [11] released new dietary reference intakes (DRIs) for calcium , phosphorous , magnesium ,vit. D and fluoride . DRIs encompass consideration of the estimated average requirements (EAR),the recommended dietary allowances (RDAs),the adequate intake (AI) and the tolerable upper level (UL) .The EAR represents the nutrient intake estimated to meet the requirements of a specified indicator of adequacy in 50% of the individuals at a life stage in a gender group [11] .EAR is a daily average over time ,generally one week . The RDA is the daily dietary intake sufficient to meet the individual nutrient requirements of 97 –98 % of individuals in the life stage and gender group. If the EAR is available, the RDA=+2SD EAR . In those instances, in which there is insufficient scientific evidence to calculate an EAR , the AI is used as an approximation of the average nutrient intake. The 1997 report recommends that AIs be used for all nutrients up to 1 year of age and for calcium,vit D and fluoride for all life stages . Representative values are given in *Table (2).*

It is likely that as further scientific evidence becomes available, DRIs will replace RDA [11] .Substrates can be classified into macronutrient, which have to be supplied in gram amounts and micronutrients which are required in small amounts .

TABLE 1 Food and Nutrition Board, National Academy of Sciences—National Research Council Recommended Dietary Allowances (Revised 1989)*†

							Fat-Soluble Vitamins			Water-Soluble Vitamins							Minerals			
Category	*Age (yr) or Condition*	*Weight‡ (kg)*	*(lb)*	*Height‡ (cm)*	*(in)*	Protein (g)	*Vitamin A (μg RE)§*	*Vitamin E (mg α TE)¶*	*Vitamin K (μg)*	*Vitamin C (mg)*	*Thiamine (mg)*	*Riboflavin (mg)*	*Niacin (mg NE)***	*Vitamin B-6 (mg)*	*Folate (μg)*	*Vitamin B-12 (μg)*	*Iron (mg)*	*Zinc (mg)*	*Iodine (μg)*	*Selenium (μg)*
Infants	0.0–0.5	6	13	60	24	13	375	3	5	30	0.3	0.4	5	0.3	25	0.3	6	5	40	10
	0.5–1.0	9	20	71	28	14	375	4	10	35	0.4	0.5	6	0.6	35	0.5	10	5	50	15
Children	1–3	13	29	90	35	16	400	6	15	40	0.7	0.8	9	1.0	50	0.7	10	10	70	20
	4–6	20	44	112	44	24	500	7	20	45	0.9	1.1	12	1.1	75	1.0	10	10	90	20
	7–10	28	62	132	52	28	700	7	30	45	1.0	1.2	13	1.4	100	1.4	10	10	120	30
Males	11–14	45	99	157	62	45	1,000	10	45	50	1.3	1.5	17	1.7	150	2.0	12	15	150	40
	15–18	66	145	176	69	59	1,000	10	65	60	1.5	1.8	20	2.0	200	2.0	12	15	150	50
	19–24	72	160	177	70	58	1,000	10	70	60	1.5	1.7	19	2.0	200	2.0	10	15	150	70
	25–50	79	174	176	70	63	1,000	10	80	60	1.5	1.7	19	2.0	200	2.0	10	15	150	70
	51+	77	170	173	68	63	1,000	10	80	60	1.2	1.4	15	2.0	200	2.0	10	15	150	70
Females	11–14	46	101	157	62	46	800	8	45	50	1.1	1.3	15	1.4	150	2.0	15	12	150	45
	15–18	55	120	163	64	44	800	8	55	60	1.1	1.3	15	1.5	180	2.0	15	12	150	50
	19–24	58	128	164	65	46	800	8	60	60	1.1	1.3	15	1.6	180	2.0	15	12	150	55
	25–50	63	138	163	64	50	800	8	65	60	1.1	1.3	15	1.6	180	2.0	15	12	150	55
	51+	65	143	160	63	50	800	8	65	60	1.0	1.2	13	1.6	180	2.0	10	12	150	55
Pregnant						60	800	10	65	70	1.5	1.6	17	2.2	400	2.2	30	15	175	65
Lactating	1st 6 mo					65	1,300	12	65	95	1.6	1.8	20	2.1	280	2.6	15	19	200	75
	2nd 6 mo					62	1,200	11	65	90	1.6	1.7	20	2.1	260	2.6	15	16	200	75

**The allowances, expressed as average daily intakes over time, are intended to provide for individual variations among most normal persons as they live in the United States under usual environmental stresses. Diets should be based on a variety of common foods in order to provide other nutrients for which human requirements have been less well defined. See text for detailed discussion of allowances and of nutrients not tabulated.*

†Designed for the maintenance of good nutrition of practically all healthy people in the United States.

‡Weights and heights of Reference Adults are actual medians for the population in the United States of the designated age, as reported by National Health and Nutrition Examination Survey (NHANES II). The median weights and heights of those younger than 19 years of age were taken from Hamil H, et al: Physical growth: National Center for Health Statistics percentiles. Am J Clin Nutr 32:607, 1979. The use of these figures does not imply that the height-to-weight ratios are ideal.

§Retinol equivalents. 1 retinol equivalent (RE) = 1 μg retinol or 6 μg β-carotene. See text for calculation of vitamin A activity of diets as retinol equivalents.

¶α-Tocopherol equivalents. 1 mg d-α-tocopherol = 1 mg α-TE. See text for variation in allowances and calculation of vitamin E activity of the diet as α-tocopherol equivalent.

***1 NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan.*

TABLE 2 Dietary Reference Intake Values by Life Stage Group

Nutrient	Calcium	Phosphorus			Magnesium						Vitamin D	Fluoride	
					EAR[c] (mg/d)		*RDA*[d] (mg/d)		*AI*[b] (mg/d)			*AI*[b] (mg/d)	
Life Stage Group[a]	*AI*[b] (mg/d)	*EAR*[c] (mg/d)	RDA[d] (mg/d)	AI[b] (mg/d)	Male	Female	Male	Female	Male	Female	*AI*[b,e,f] (μg/d)	Male	Female
0–6 mo	210	-	-	100	-	-	-	-	30	30	5	0.01	0.01
6–12 mo	270	-	-	275	-	-	-	-	75	75	5	0.5	0.5
1–3 y	500	380	460	-	65	65	80	80			5	0.7	0.7
4–8 y	800	405	500	-	110	110	130	130			5	1.1	1.1
9–13 y	1300	1055	1250	-	200	200	240	240			5	2.0	2.0
14–18 y	1300	1055	1250	-	340	300	410	360			5	3.2	2.9
19–30 y	1000	580	700	-	330	255	400	310			5	3.8	3.1
31–50 y	1000	580	700	-	350	265	420	320			5	3.8	3.1
51–70 y	1200	580	700	-	350	265	420	320			10	3.8	3.1
>70 y	1200	580	700	-	350	265	420	320			15	3.8	3.1
Pregnancy													
≤18 y	1300	1055	1250	-		335	-	400	-	-	5	-	2.9
19–50 y	1000	580	700	-		290		350	-			-	3.1
31–50 y						300		360					
Lactation													
≤18 y	1300	1055	1250	-		300		360	-	-	5	-	2.9
19–50 y	1000	580	700	-		255		310	-	-		-	3.1
31–50 y						265		320					

[a] *All groups except Pregnancy and Lactation are males and females unless separately labeled.*

[b] *AI, Adequate Intake. The observed average or experimentally set intake by a defined population or subgroup that appears to sustain a defined nutritional state, such as growth rate, normal circulating nutrient values, or other functional indicators of health. AI is used if sufficient scientific evidence is not available to derive an EAR. For healthy breast-fed infants, AI is the mean intake. Some seemingly healthy individuals may require higher calcium intakes to minimize risk of osteopenia and some individuals may be at low risk on even lower intakes. The AI is not equivalent to an RDA.*

[c] *EAR, Estimated Average Requirement. The intake that meets the estimated nutrient needs of 50% of the individuals in a group.*

[d] *RDA, Recommended Dietary Allowance. The intake that meets the nutrient need of almost all (97–98%) of individuals in a group.*

[e] *As cholecalciferol. 1 μg cholecalciferol = 40 IU vitamin D.*

[f] *In the absence of adequate exposure to sunlight.*

Adapted from Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride; Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine, National Academy of Sciences. Washington, D.C.: National Academy Press, 416 pp., 1997.