

Food4Growth

Why is it important to monitor intake among hospital patients?


Conference: Eating, wellbeing & nutrition in ageing societies
Nordic & Chinese perspectives Shanghai. Nordic centre, Fudan University, April 16, 2018

Professor Gengsheng He
Dept. of Nutrition and Food Hygiene
School of Public Health
Fudan University
Shanghai, China
gshe@shmu.edu.cn

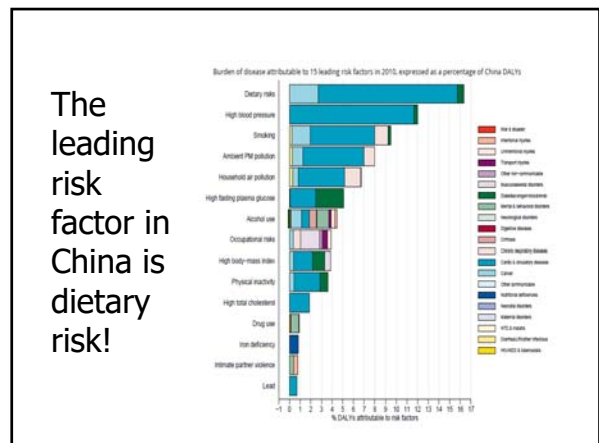
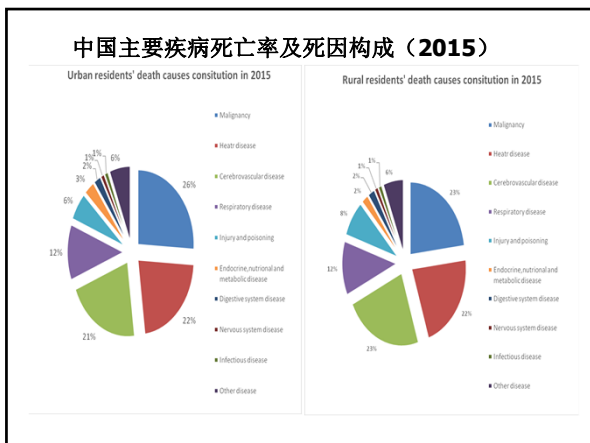


Contents

- Burden of Hospital malnutrition
- Impact of nutrition intervention on key outcomes
- Barriers to good nutritional care in hospitals
- Promoting good nutritional care in hospitals



2



Burden of Hospital malnutrition

- At least **one third** of patients in developed countries have some degree of malnutrition upon admission to the hospital.
- If left untreated ,approximately, **two thirds** of those patients will experience a further decline in their nutrition status during inpatient stay.
- Despite the availability of validated screening tools, malnutrition continues to be under-recognized in many hospital



Am J Clin Nutri;66:1232-9

Malnutrition –the most common and the most unnoticed

35.5% inpatients have malnutrition risk according the Nutritional risk screening (NRS 2002) in 19 tertiary hospital,13 cities in 2008.

表 1 营养不足与营养风险发生情况

科室	n	营养不足	无营养风险 (NRS<3分)	营养风险 (NRS≥3分)
呼吸内科	2 572	343(13.3%)	1 635(63.6%)	937(36.4%)
普通外科	2 817	329(11.7%)	1 862(66.1%)	955(33.9%)
神经内科	2 740	116(4.2%)	1 736(63.4%)	1 004(36.6%)
肾脏内科	2 312	325(14.1%)	1 722(74.5%)	590(25.5%)
消化内科	2 526	429(17.0%)	1 396(55.3%)	1 130(44.7%)
胸外科	2 131	263(12.3%)	1 380(64.8%)	751(35.2%)
合计	15 098	1 805(12.0%)	9 731(64.9%)	5 367(35.5%)



蒋朱明等. 中国临床营养杂志, 2008, 16 (6) : 335-337

Only **32.7%** patients got nutrition support.

81% malnutritional patients not aware of the problem.



蒋朱明等. 中国临床营养杂志, 2008, 16 (6) : 335-337

7

Table 1. Causes of disease-related under-nutrition (Green 1999)

CATEGORY	CAUSE	EXAMPLES
Reduced food intake	Anorexia	Poor appetite, nausea and vomiting as a result of disease process, treatment or Depression
	Change in taste and smell	Due to treatment or medication
	Episodes of fasting	Before investigative procedures or operations; missed meals due to these procedures, or avoidance of food due to diarrhea
	Pain on eating	Sore mouth due to disease or partial gastrointestinal obstruction
	Difficulties in chewing and swallowing	Dysphagia (e.g. due to stroke or dementia), ill-fitting dentures, poor oral health
	Inability to eat independently	Physical handicap, arthritis, dementia
Mal-absorption	Respiratory problems	Pulmonary disease
	Impaired digestion	Pancreatic insufficiency, enzyme deficiencies (e.g. cystic fibrosis)
	Impaired absorption	Intestinal resection (short bowel syndrome), mucosal damage (e.g. inflammatory bowel disease)
Modified metabolism	Excess losses from the gut	High output fistulae, protein losing enteropathy, short bowel syndrome.
	Metabolic response to disease	Malignancy, trauma, chronic sepsis, multiple organ failure, advanced HIV infection
	Metabolic consequences of impaired organ function	Renal disease, liver disease, pulmonary disease


Adverse outcomes:

- **Increased morbidity:** impaired wound healing, immune suppression, increased infection rate
- **Enhanced mortality**
- **Reduced quality of life:** Muscle wasting and functional loss, increasing the risk of falls
- **Extended recovery:** longer length of hospital stay, higher readmission

Increased health care costs

Impact of nutrition intervention on key outcomes

- **Clinical Complications**
- **Length of Stay**
- **Readmissions**
- **Mortality**



9

“ Food is your medicine- hence let your medicine be your food”


Hippocrates, circa 400 BC



10

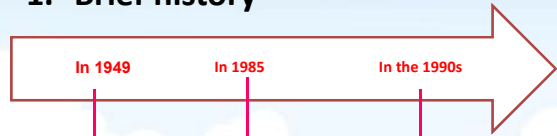
Barriers to good nutritional care in hospitals

1. Unrecognized or inadequately screened
2. Lack adequate dietitian staffing
3. Lack of sufficient education in nutrition among all staff groups and cooperation between staff groups
4. Delayed nutrition care
5. Patients experience difficulty consuming meals
6. Lack of influence of patients




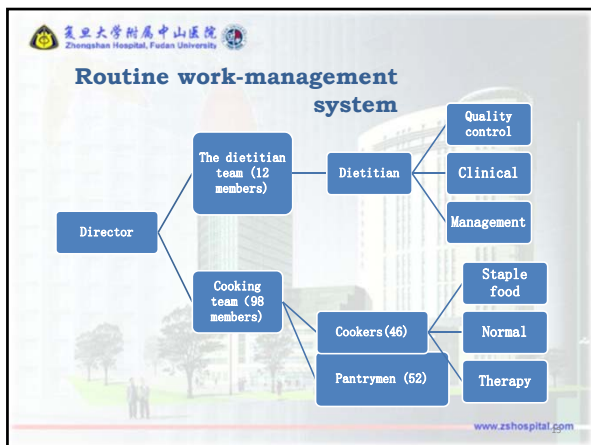
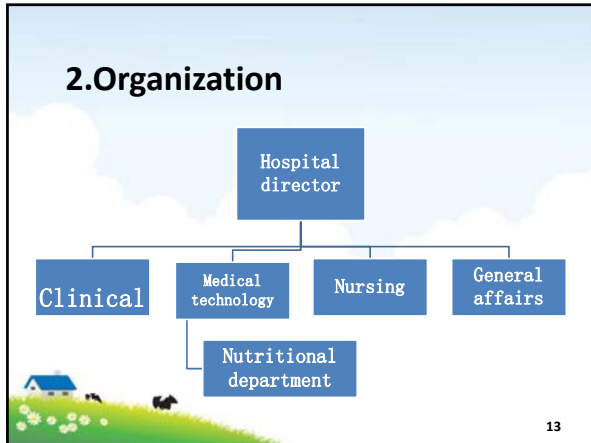
11

1. Brief history




- In 1949**
 - Nutrition division was established in several big hospitals.
- In 1985**
 - The Ministry of health set the nutrition division as one of the clinical division.
- In the 1990s**
 - Implementation of standardized management.
 - Become one of the important indicators of the first-class hospital accreditation assessment.





Routine work of Nutritional Department

- Clinical nutrition
- Teaching
- Research work
- Diet management for patients
- Others
 - Training management and financial management





17

Organization

Dietitian

1. Make recipe for the patients
2. Nutrition education
3. Manage nutrition kitchen
4. Pay attention to food safety
5. Participation in clinical diagnosis
6. Strengthen the self learning

复旦大学附属中山医院
Zhongshan Hospital, Fudan University

Clinical nutrition screening and assess




NRS-2002

www.zshospital.com

3. Dietary Therapy

Health diet	Regular meal, soft meal, semi-liquid meal, liquid meal.
Therapeutic diet	Low protein diet, diabetic diet, high energy, high protein, carbohydrate restricted, fat restricted limit cholesterol, dietary fiber etc.
Diet for diagnosis	Colonoscopy
Tube feeding	Nasal F: coma, vomiter or unable to eat through mouth (no throat and esophageal disorders). Intubation F: no throat esophagus access but gastrointestinal fistula.
ONS	Commercial products mostly. Mainly used in digestive tract fistula, severe enteritis, chronic diarrhea, short bowel syndrome, pancreatitis, severe burn and etc.



4. Process of food supply

- 1 • Medical prescription from clinician
- 2 • Menu is made by pantryman according to the medical advise
- 3 • Dietitian check and stats the menus
- 4 • Process of cooking
- 5 • Pantrymen give out food to the patients

www.zshospital.com

5. Food safety management

- **Personal hygiene:** a health certificate (annual review); cannot work once get sick.
- **Dishware disinfection:** recycling—cleaning—cleaning with disinfectant—high-temperature sterilization.
- **Samples Retention:** more than 100g for 48 hours in special refrigerator lower than 8°C. Keep record, double check, daily cleaning and disinfection.

www.zshospital.com

Regular diet

- Meat dish 150g,
- vegetables 200g,
- meat with vegetables 150g
- Meals are self-paying by patients
- 22 RMB (about 2.2 EUR) a day

www.zshospital.com

Table 1. Validated malnutrition screening tools for hospitalized patients^a

Screening tool	Parameters/scoring	Development	Validation
Malnutrition Screening Tool (MST)	Weight loss, appetite; at-risk score ≥ 2	408 inpatients (mean age=58 y); standard for comparison: SGA ^b ; sensitivity 93%; specificity 93%	SGA: sensitivity 92%, specificity 61%; MNA ^c : sensitivity 92%, specificity 72%
Mini Nutritional Assessment/Short Form (MNA-SF)	Weight change, recent intake, BMI ^d , acute disease, mobility, dementia/depression; at-risk score ≤ 11	155 community-dwelling elders (mean age=79 y); standard for comparison: physician assessment of nutritional status; sensitivity 98%; specificity 100% (MNA-SF ^e cut point ≤ 10)	MNA: sensitivity 90%, specificity 88% (MNA-SF cut point ≤ 11) MNA: sensitivity 89%, specificity 82% (MNA-SF cut point ≤ 11) "Nutritional assessment": sensitivity 100%, specificity 38% (MNA-SF cut point ≤ 10)
Malnutrition Universal Screening Tool (MUST)	Weight change, recent/predicted intake, BMI, acute disease; high-risk score ≥ 2	8,944 inpatients, review of 128 trials (mean age not reported); standard for comparison: nutrition support trials demonstrating improved clinical outcomes; sensitivity 75%; specificity 55%	SGA: sensitivity 61%, specificity 79%; SGA: sensitivity 72%, specificity 90%; MNA: $\alpha=0.39$ MNA: $\alpha=0.55$
Nutritional Risk Screening 2002 (NRS 2002)	Weight change, recent intake, BMI, acute disease, age; at-risk score ≥ 3	Adapted from Malnutrition Advisory Group screening tool	SGA: sensitivity 74%, specificity 87%; MNA: $\alpha=0.39$ SGA: sensitivity 62%, specificity 63%; MNA: $\alpha=1.00$
Short Nutritional Assessment Questionnaire (SNAQ)	Weight change, appetite, supplements/tube feeding; at-risk score ≥ 2	291 inpatients (mean age=58 y); standard for comparison: BMI < 18.5 or weight loss $> 5\%$; sensitivity 86%; specificity 89%	BMI < 18.5 or recent weight loss $> 5\%$: sensitivity 79%, specificity 83%

a. Adapted with permission from Young and colleagues. b. SGA=Subjective Global Assessment c. MNA=Mini Nutritional Assessment d. BMI=body mass index; calculated as kg/m². e. SF=short-form.

Nutrition risk screening for elderly patients

Tool	Malnutrition	Nutrition at risk	
NRS 2002	10.07%	46.23%	
MNA-SF	15.13%	50.06%	

Malnutrition increasing with aging (%)

year	NRS 2002		MNA-SF	
	Under nutrition	Nutrition risk	Under nutrition	Nutrition risk
65-	8.91	31.42	10.81	43.29
70-	9.71	50.65	14.27	49.42
80-	13.04	55.47	21.61	57.32
90-	17.53	57.08	33.05	72.10
Avg.	10.07	46.23	15.13	50.06

10181 ELDERLY PATIENTS IN 30 CITIES FROM 14 CITIES CSPEN 2012₂₅

Knowledge, Attitudes, Practices and Its Influential Factors in Patients with Chronic Kidney Disease

MPH : JIANG Lijing
 Supervisor: Prof. HE Gengsheng
 School of Public Health
 Fudan University

26

Research Background

- Chronic Kidney Disease (CKD)**
 Kidney damage ≥3 months. Kidney damage is defined as structural or functional abnormalities, with or without reduction in glomerular filtration rate (GFR).
- High CKD prevalence**
 U.S.: 11.5%, 2009
 Shanghai: 11.8% (in urban communities), 2008

27

Research Background

- Low-protein Diet**
Definition: A dietary therapy in which people restrict their dietary protein on the basis of adequate energy intake, with or without a ketoacid / amino acid supplement.
 Prescribed and supervised by nephrologists / dietitians.
Effect: In a U.S.MDRD study, a reduced protein consumption by 0.2g/kg/day on average attenuated the GFR decline by 1.15ml/min/year.
Current Status: Poor adherence to low-protein diet therapy clinically
 Abroad - low adherence rate (51%)
 China - rarely reported

28

Research Significance



- Implementation of an educational program on low-protein diet in CKD patients can help slow the disease progression, delay initiation of dialysis, and achieve significant economic benefits.



29

Research Methods



Study Design

- **Study Subjects:** patients diagnosed with **CKD1-4** at Department of Nephrology, Zhongshan Hospital, Fudan University from Nov. 2011 to Jul. 2012
- **Inclusion Criteria:** diagnosed with CKD1-4, aged between 18 to 75 years, with reading comprehension ability, informed consent



30

Physical Examination



- **Physical Examination:** height, weight, BP, and presence of edema
 - **Biochemical Examination:** serum total protein, albumin, prealbumin, hemoglobin, transferrin, urea nitrogen, creatinine, uric acid, fasting glucose, etc.
 - **Evaluation of Nutritional Status:** NRS2002
 - **A Self-designed Questionnaire:**
Designed according to current status on low-protein diet and CKD at home & abroad, KAP related research literature, and professional knowledge
- ◆ With both reliability and validity evaluated



31

Questionnaire Content:




- **Demographic Data:** age, sex, occupation, education, place of residence, marital status, per capita monthly household income, economic burden, etc.
- **Clinical Data:** clinical diagnosis, pathologic diagnosis, CKD stage, progression, frequency of hospitalization for CKD, with or without hypertension/ diabetes mellitus/ gout, etc.
- **Medications:** Compound α - Ketoacid tablets/ hormones, etc. in use or not



32


Questionnaire Content :

- **Knowledge Questionnaire:** 10 questions about patients' concept of low-protein diet, high quality protein, the appropriate amount of dietary protein, etc.
- **Attitude Questionnaire:** 10 questions about patients' attitude to low-protein diet therapy, etc.
- **Behavior Questionnaire:** 10 questions about patients' dietary changes (in protein/staple food/etc.) before and after developing CKD



33

- **In total: 159 completed questionnaires,**
- **78 from males and 81 from females**
- **The average age: 45.97 ± 15.80 y**



34

knowledge

Table 4 Questions with Highest Scores for the Knowledge Part (n=159)

Question NO.	Question Content	Score Frequency	Score Rate (%)
3	Have you heard of low-protein diet?	105	66.0
2	Do you think it necessary to restrict protein intake for CKD patients?	104	65.4
6	Which of the following food contains high quality protein?	86	54.1

- Lack of knowledge of low-protein diet.

35

Analysis of Attitude Score

Table 8 Questions with Highest Scores for the Attitude Part (n=159)

Question NO.	Question Content	Score Frequency	Score Rate (%)
5	Do you need low-protein diet knowledge from nutritionists?	151	95
4	Do you want knowledge of CKD?	150	94.3
7	Are you willing to change your dietary pattern according to your condition?	147	92.5

- Patients answered positively, but with tendentiousness.

36

Results: Analysis of Practice Score

Table 10: Questions with Highest Scores for the Practice Part (n=159)

Question NO.	Question Content	Score Frequency	Score Rate (%)
11	Whether the participant initiatively acquired knowledge through various channels after illness	98	61.3
5	Whether there was any change in his/her dietary pattern after illness	82	51.6
9	Whether he/she ate soy products after illness	43	27.0

- The Practice part scored the lowest.

37

Results: Analysis of Practice Score

Table 13: Multiple Linear Stepwise Regression Analysis of Influential Factors on Practice Score

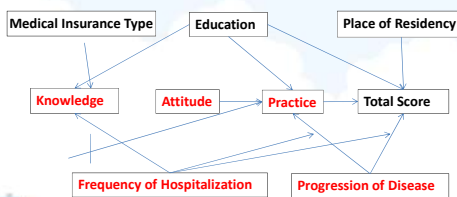
Independent IF	β (SE)	P	
Education Level	≤ Primary School	Referent	
	Middle or High School	3.57 (3.55)	0.289
	≥(Junior) College	10.55 (4.17)	0.013
Frequency of Hospitalization	Once	Referent	
	Twice	12.94 (3.50)	<0.001
	3 Times	5.32 (4.20)	0.208
	>3 Times	8.00 (4.05)	0.040
Knowledge Score	Low	Referent	
	Intermediate	5.00 (3.37)	0.141
	High	13.02 (3.63)	0.001

*adjust age, sex, education level, frequency of hospitalization, medical insure

38

Summary

- Preliminary Conclusion: the influential factors on KAP shown below



39

Promoting good nutritional care in hospitals

1)The management system need be unified

Although nutrition division is divided into clinical division by National ministry of health, but there are still some hospital nutrition division divided into service division.

No center kitchen system in hospital.

2)Capacity building

Each 100~130 beds should be equipped with one dietitian. But actually, one dietitian has to manage 200~300 beds in many hospitals. And the level of education of dietitians is relatively poor.

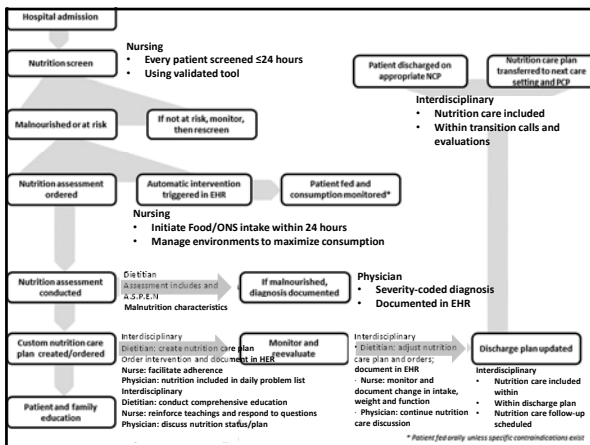
3) Improve the patient satisfaction
 order food base menu system. Provide warm food .
 Improve the dining rate of patients in hospital

4) Nutrition education



Principle 1: Create Institutional Culture	<ul style="list-style-type: none"> Know the fact-nutrition improves patient outcomes Support adequate and appropriate nutrition intervention Identify motivated champions among hospital stakeholders
Principle 2: Redefine Clinicians' Roles to Include Nutrition	<ul style="list-style-type: none"> Empower dietitians Secure nurse and physician leadership Engage teamwork(eg, daily team huddles) to include nutrition
Principle 3: Recognize and Diagnose All Patients at Risk	<ul style="list-style-type: none"> Assure accountability for malnutrition identification Use valid screening tool and criteria to assess/diagnose malnutrition Include fields for malnutrition characteristics in EHR
Principle 4: Rapidly Implement Interventions and Continued Monitoring	<ul style="list-style-type: none"> Establish policy to feed patients within 24h of 'at-risk' screen Create EHR prompt for diet order when 'at-risk' screening date entered Monitor patient's food and oral nutrition supplement consumption
Principle 5: Communicate Nutrition Care Plans	<ul style="list-style-type: none"> Leverage HER to standardize nutrition documentation When present, ensure coding of mild, moderate, or severe malnutrition as complication condition to primary diagnosis Ensure care discussions include nutrition
Principle 6: Develop Discharge Nutrition Care and Education Plan	<ul style="list-style-type: none"> Ensure nutrition care plan incorporated into the discharge plan Educate patient and their families Communicate with the patient's health care providers

Figure 1. The Alliance's Key Principles for Advancing Patient Nutrition. HER=electronic health record



Acknowledgement

Dept. Nutrition ,Zhongshan Hospital

Thank you for your attention!

