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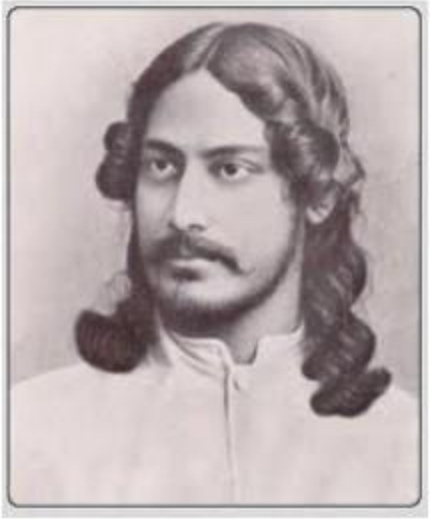
ATN
BANGLA

- Old age is not a disease , but biological process.
- Inevitable , Irreversible , progressive phenomenon.
- Accumulation of chronic disease
- Nutrition can alter , retard the process

রসনায় তৃপ্ত বাঙালী

আমসত্ব দুধে ফেলি, তাহাতে কদলি দলি,
সন্দেশ মাখিয়া দিয়া তাতে।
হাপুস হুপুস শব্দ, চারিদিক নিঃশব্দ,
পিপিড়া কান্দিয়া যায় পাতে।

—রবীন্দ্রনাথ ঠাকুর



NUTRITION IN ELDERLY

Introduction

- Nutrition is important determinant of health in elderly patients.

- **Malnutrition is defined as a state in which deficiency , excess or imbalance of energy ,protein and other nutrients causes adverse effects on body formation, function and clinical outcome.**

Malnutrition: Scope of The Problem

Prevalent across all healthcare settings

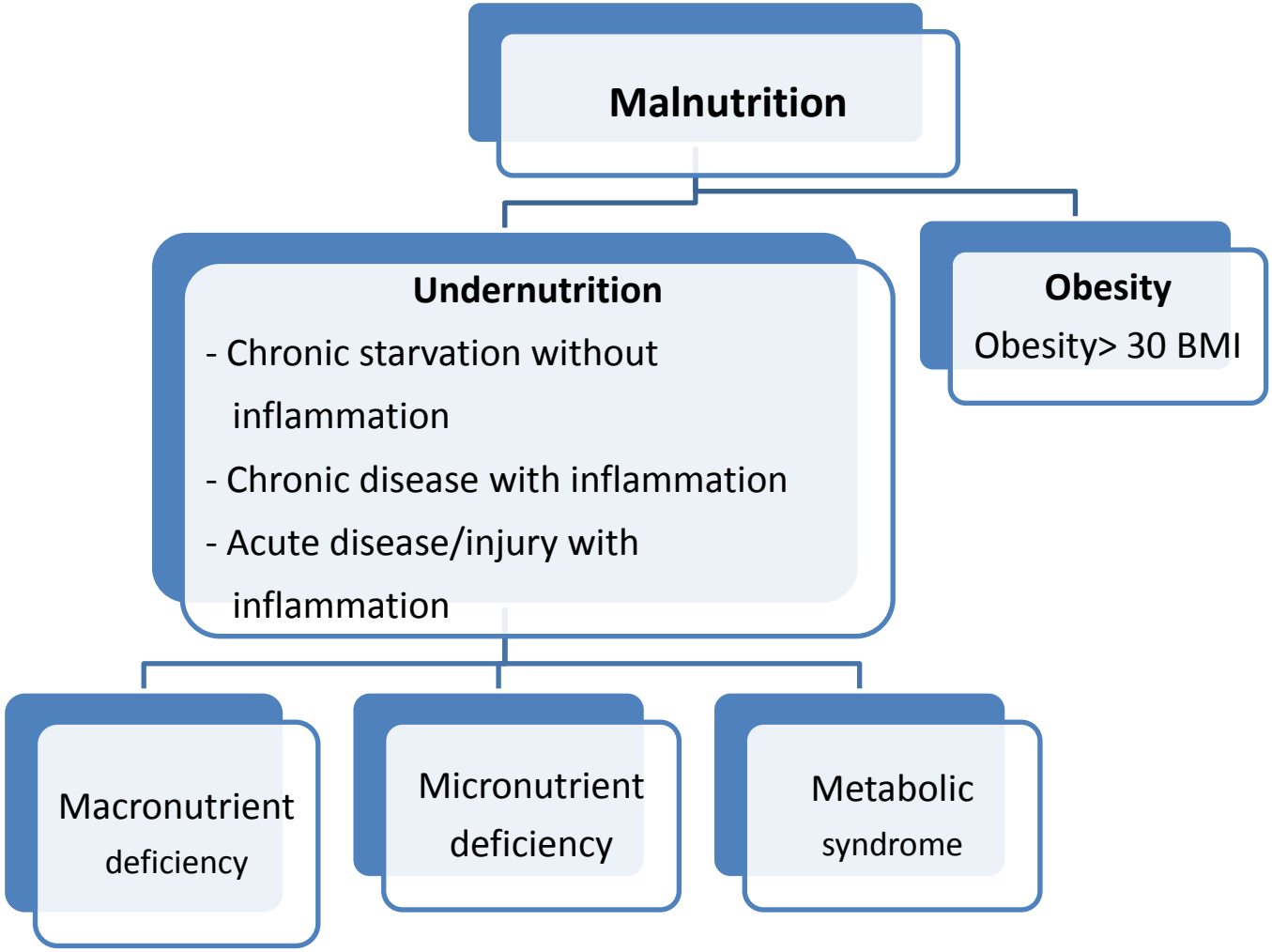
Healthcare Setting	Prevalence
Hospital	30-50%[1-4]
Long-term care	21%-51%[5]
Outpatient & Homecare	13-30%[5]

Risk of malnutrition is increased in[6]:

- Older adults
- Critically ill patients
- Patients with comorbid chronic diseases, e.g., cancer, COPD, chronic kidney disease

.

The Malnutrition Syndrome

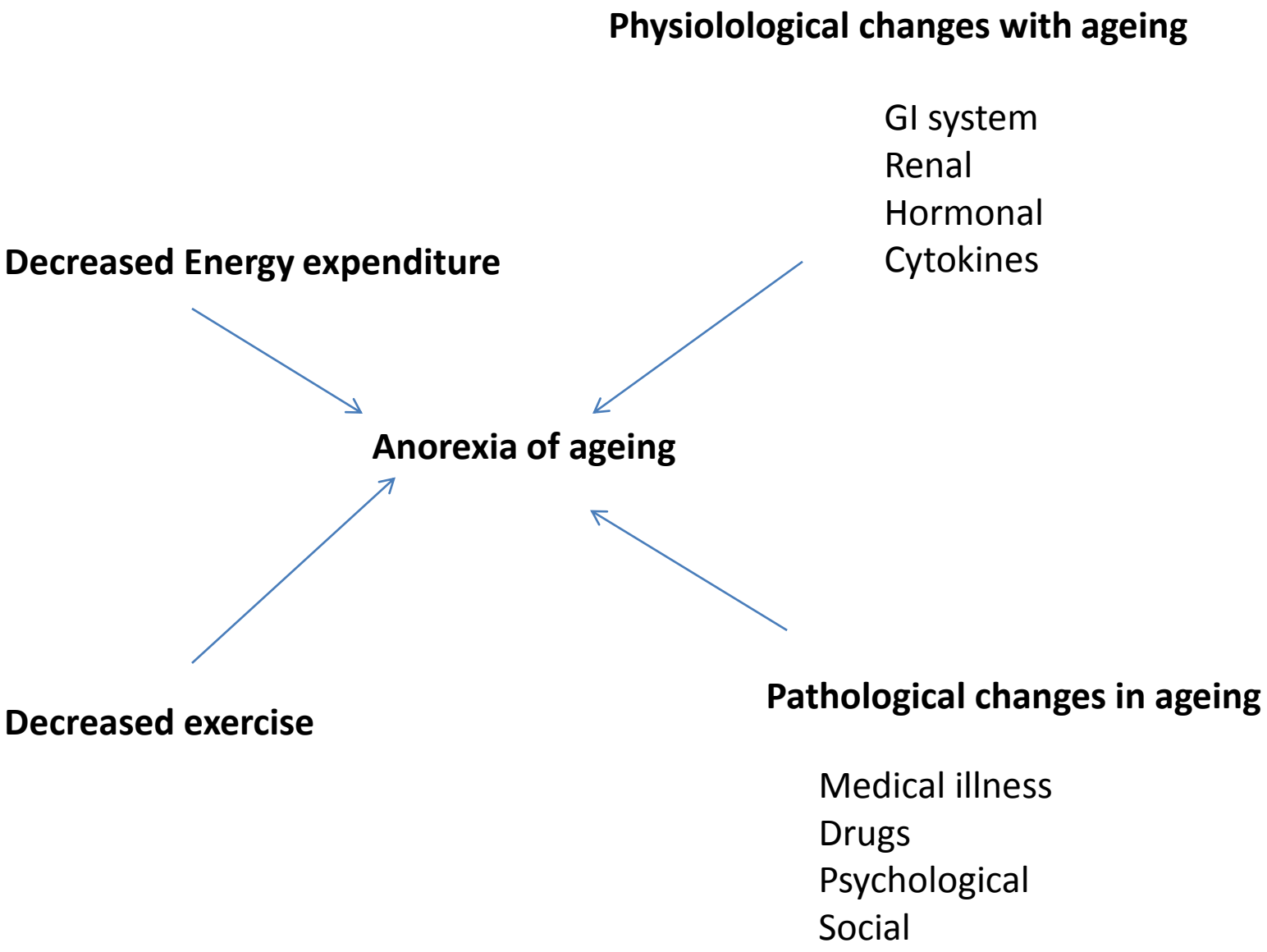


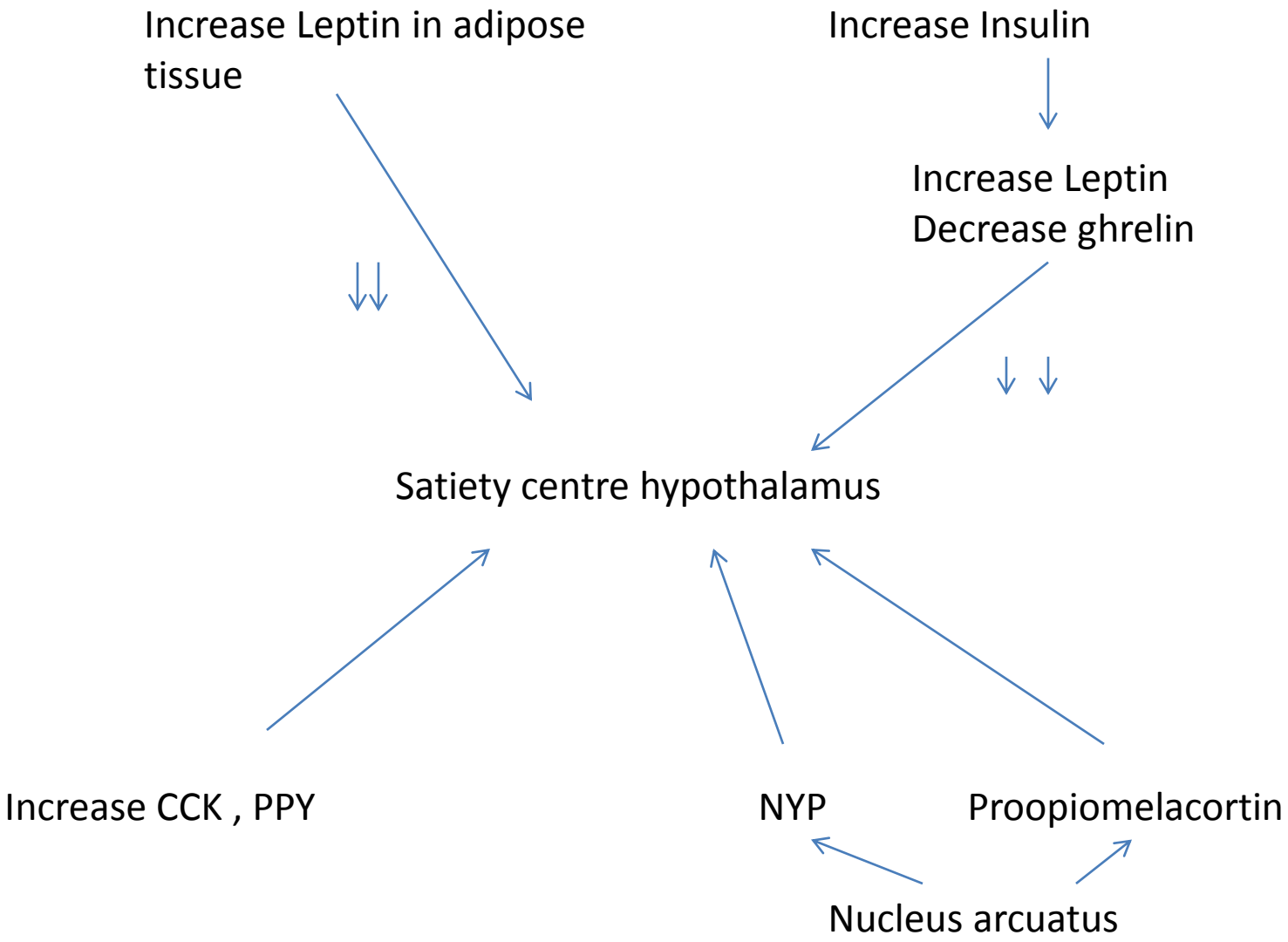
Issues

- Physiological changes
- Effect of malnutrition
- Different Types of Malnutrition
- Causes of Malnutrition
- Assessment of nutrition
- Intervention

Physiological Changes

Anorexia common in elderly


Physiolological changes with ageing
GI system
Renal
Hormonal
Cytokines
Decreased Energy expenditure
Anorexia of ageing
Decreased exercise
Pathological changes in ageing
Medical illness
Drugs
Psychological
Social

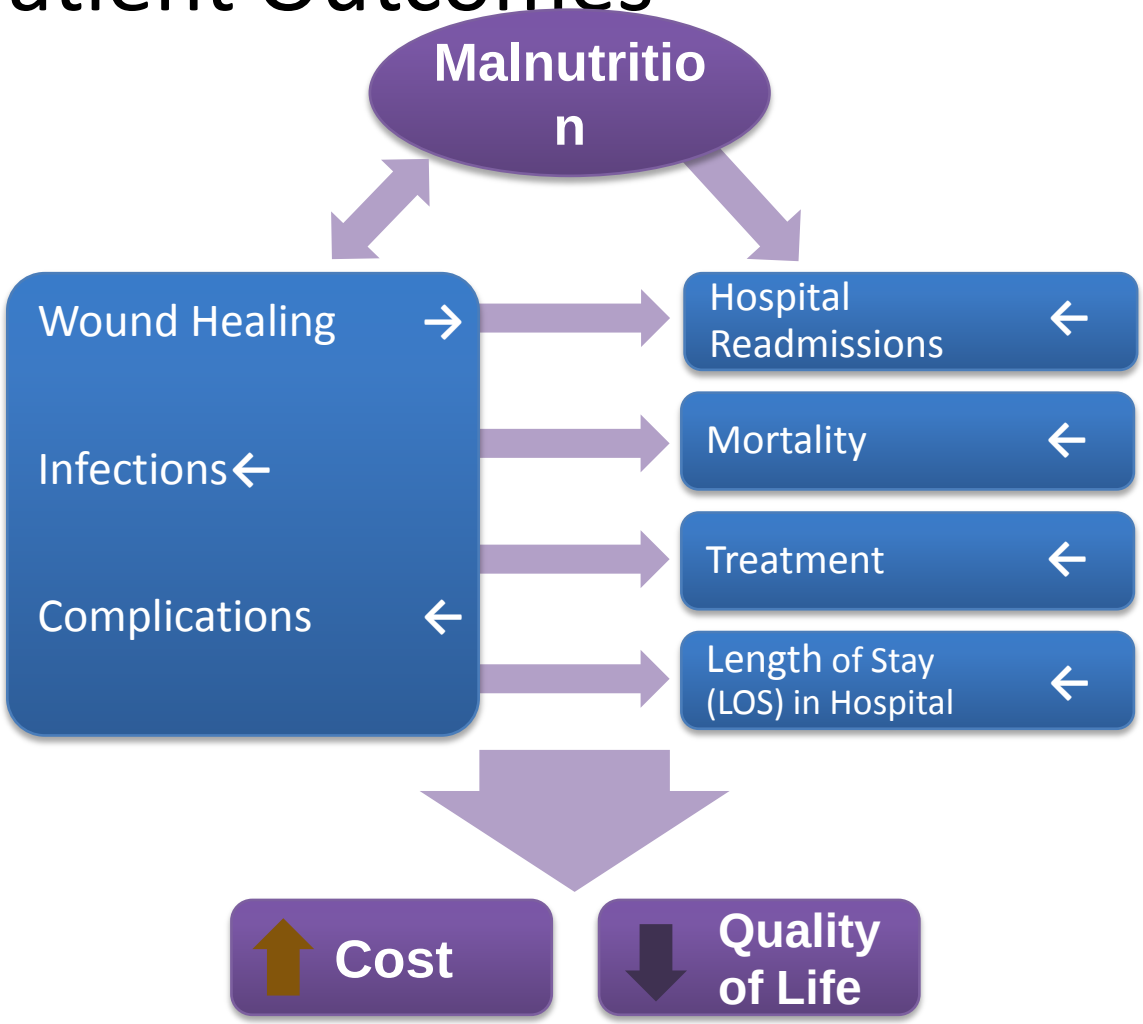

Increase Leptin in adipose tissue
Increase Insulin
Increase Leptin
Decrease ghrelin
Satiety centre hypothalamus
Increase CCK , PPY
NYP
Proopiomelacortin
Nucleus arcuatus

Causes of obesity

- Sedentary lifestyle
- Alcohol intake
- Decrease in lean body mass .
- Increase in fat in proportion
- Fat mostly deposit in Liver , abdomen.

EFFECT OF MALNUTRITION

Malnutrition Negatively Impacts Patient Outcomes

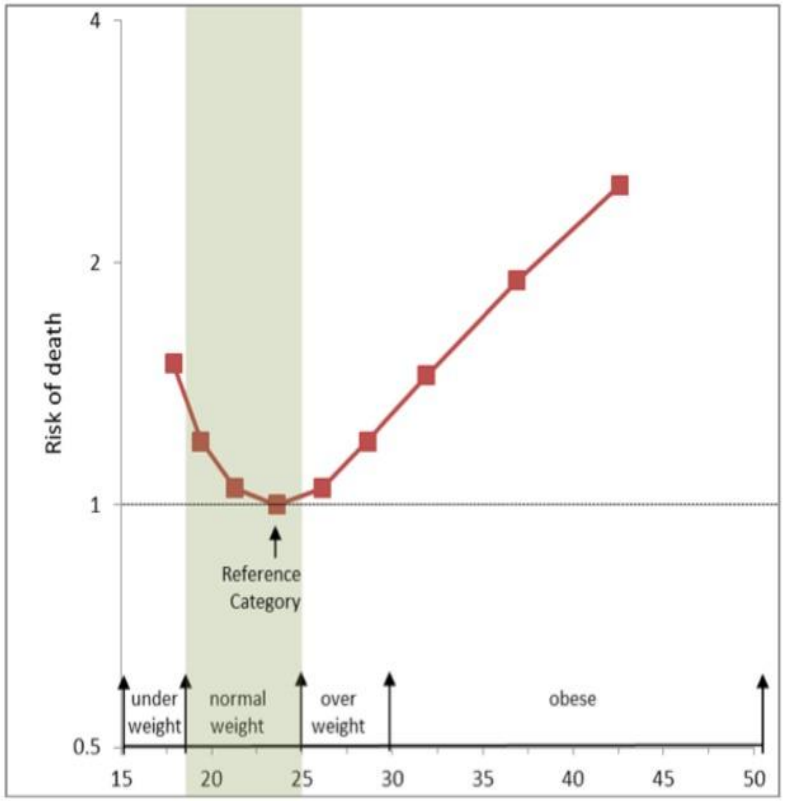


Adapted from Norman K et al. *Clin Nutr.* 2008; 27: 5-15.Allaudeen N, et al. *J Hosp Med.* 2011;6(2):54-60.

Which Patient is Malnourished?

Jensen GL, et al. *JPEN* 2010;34:156-160.

BMI and Mortality



Weight Loss

0.5% /yr common

4% weightloss/yr 12%

5% weight loss/yr increase mortality

Different types of Malnutrition

Macronutrients

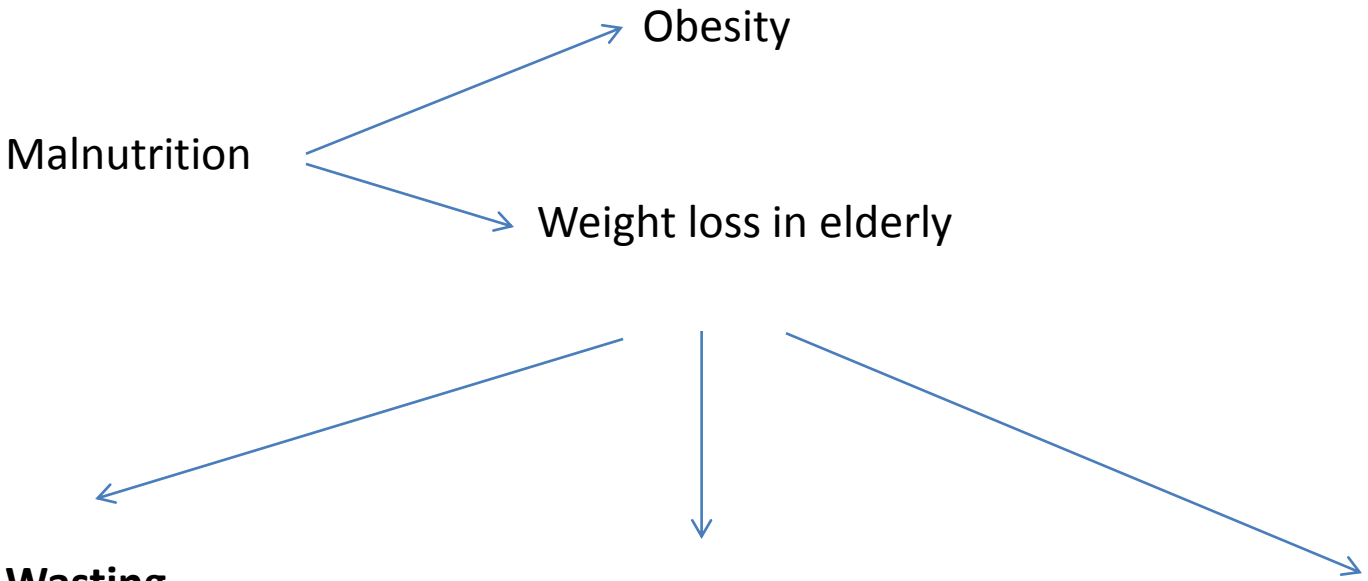
- **Protein** – 0.9-1.5gm/kg/day

  Prevent sarcopenia

  Improve muscle strength

  Immune status

  wound healing
- **Fat** - , 30% of total calorie
- **Carbohydrate** – 55-60%



Wasting
Involuntary loss of weight
Diet inadequate
Disease
Psychological factor

Sarcopenia
Loss of skeletal muscle
Reduced physical activity
Hormonal , neural, cytokine activity

Cachexia
Involuntary loss of fat free muscle
Both skeletal , organ muscle
Caused by catabolism
Increased IL, TNFalpha
Chronic disease , Malignancy

Micronutrients

- **Vit D** – reduced consumption, Formation and metabolism

  Osteomalacia , myopathy, osteoporosis

- **Vit B 12** - 12-25% population

  Vegetarian diet , atrophic gastritis

  Anaemia, Subacute combine degeneration of spinal cord , ataxia , myopathy , glossitis.

- **Folate** – 50 % elderly suffer from deficiency

  Nutrition, drug , alcohol

  Anaemia , increased incidence of cancer , cardiovascular disease .
- **Iron** – Diet , blood loss , infection e.t.c.

  anaemia , glossitis
- **Other minerals** – zinc, selenium, copper , chromium.

Causes of Malnutrition

Causes of nutritional problem

Physiological Cause

- Diminished taste and smell
- Dental Problem
- Hearing and vision problem
- Cognitive impairment
- Increased cytokine activity
- GI problem
- Hormonal

Pathological Cause

- Medical
- Psychological
- Polypharmacy
- Social
- Less exposure to sun
- Smoking , alcohol

Nutritional assessment

Dietary assessment

- Best done by dietitian
- 24 hour recall commonly used tool.

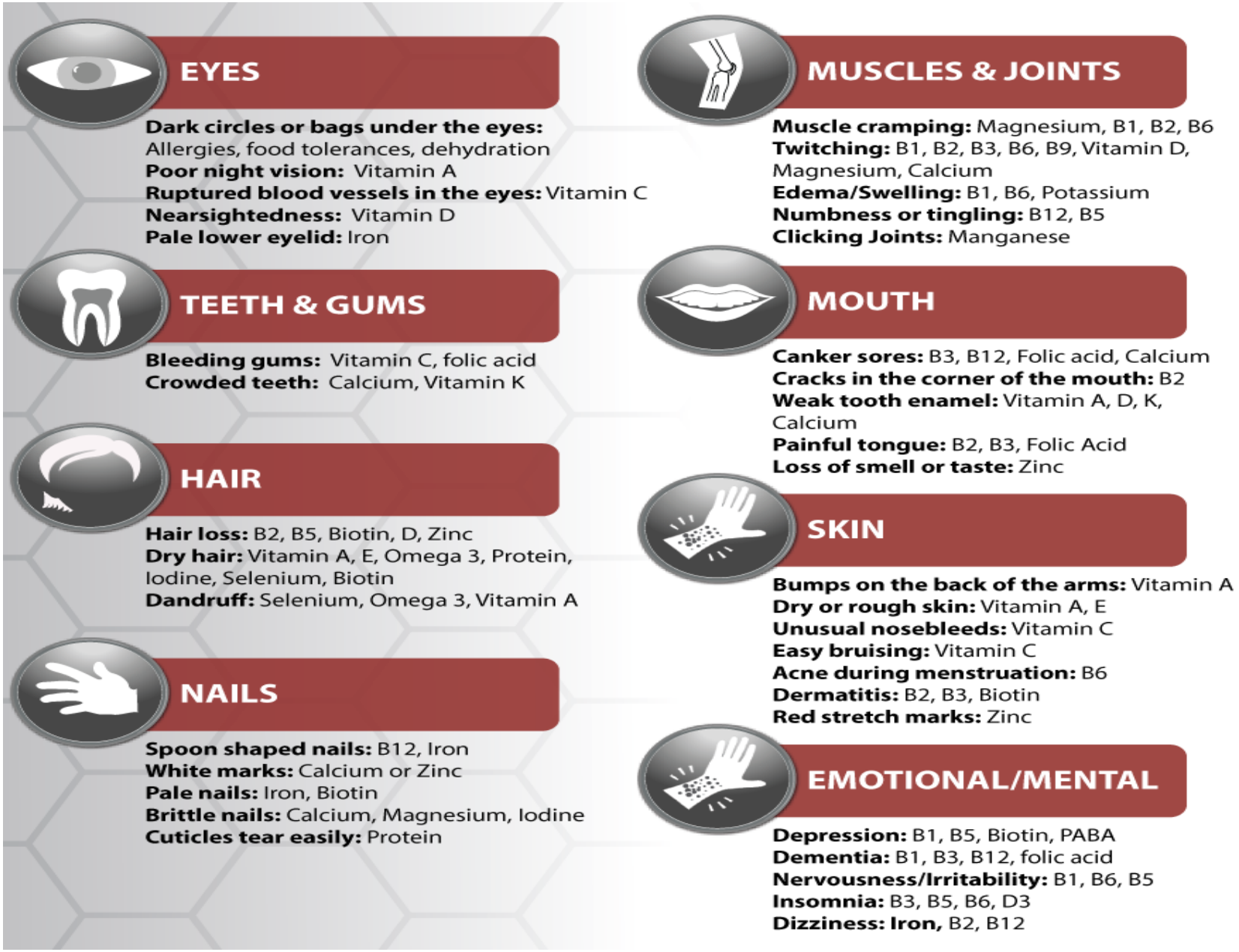
  Problem :

  Day to day variation

  Cognitive impairment
- Better approach is 7 days food recall (dairy)

  Time consuming

CLINICAL ASSESSMENT



Nutritional screening and assessment tools

SCREENING	MUST[1]	Malnutrition Universal Screening Tool	Widely used in UK, Europe
	NRS-2002[2]	Nutritional Risk Screening-2002	Widely used in European hospital settings
	MST[3]	Malnutrition Screening Tool	Developed & used in Australian hospitals
	SNAQ[4]	Short Nutritional Assessment Questionnaire	Developed & used in the Netherlands for hospitals
ASSESSMENT	SGA[5]	Subjective Global Assessment	Gold standard for assessment, often preferred for Asian populations
	MNA[6]	Mini-Nutrition Assessment	Assesses older people in multiple settings; MNA-SF is a short form for screening
	NUTRIC[7]	Nutrition Risk in the Critically Ill	Developed to determine which ICU patients will benefit from aggressive support

1. MUST, 2008 2. Kondrup 2003 3. Ferguson 1999 4. Kruiszenga 2005 5.Detsky 1987 6.Guigoz 2002; Kaiser, 2010; Loser 2010 7. Heyland 2011

MUST

- Can be used in hospital and community
- Three components – BMI, weight loss , acute illness
- Detect Low , medium , high risk older
- Need 3-5 minutes
- High predictive value in hospital outcome
- Accepted by NICE , BDA

MNA

- Have 18 items
- Take approx 15 minutes
- Predict outcome of elderly in both community and in hospital
- **Miniature Form** - 6 items , more useful

  Food intake in last three months

  Weight loss in last three months

  BMI

  Mobility

  Neuro -Psychological problem

  psychological stress

SCALES

- Sadness
- Cholesterol < 160 mg /dl
- Albumin < 4 gm /dl
- Loss of weight
- Eating problem
- Shopping problem or inability to prepare food.

Any two – high nutritional risk

Antrropometric assessment

- **BMI – (WHO guideline)**

  < 18.5 , 18.5- 24.9 , 25-29.9 , 30-39.9, > 40

  limitation :

  loss of height in elderly

  kyphosis – scoliosis

  loss of muscle tone

  confounding factor – ascites,edema

- **Mid upper arm circumference**
- **Triceps skin fold measurement**

  Limitation :

  Loose skin
- **Abdominal girth**

Biochemical markers

- **Serum albumin**

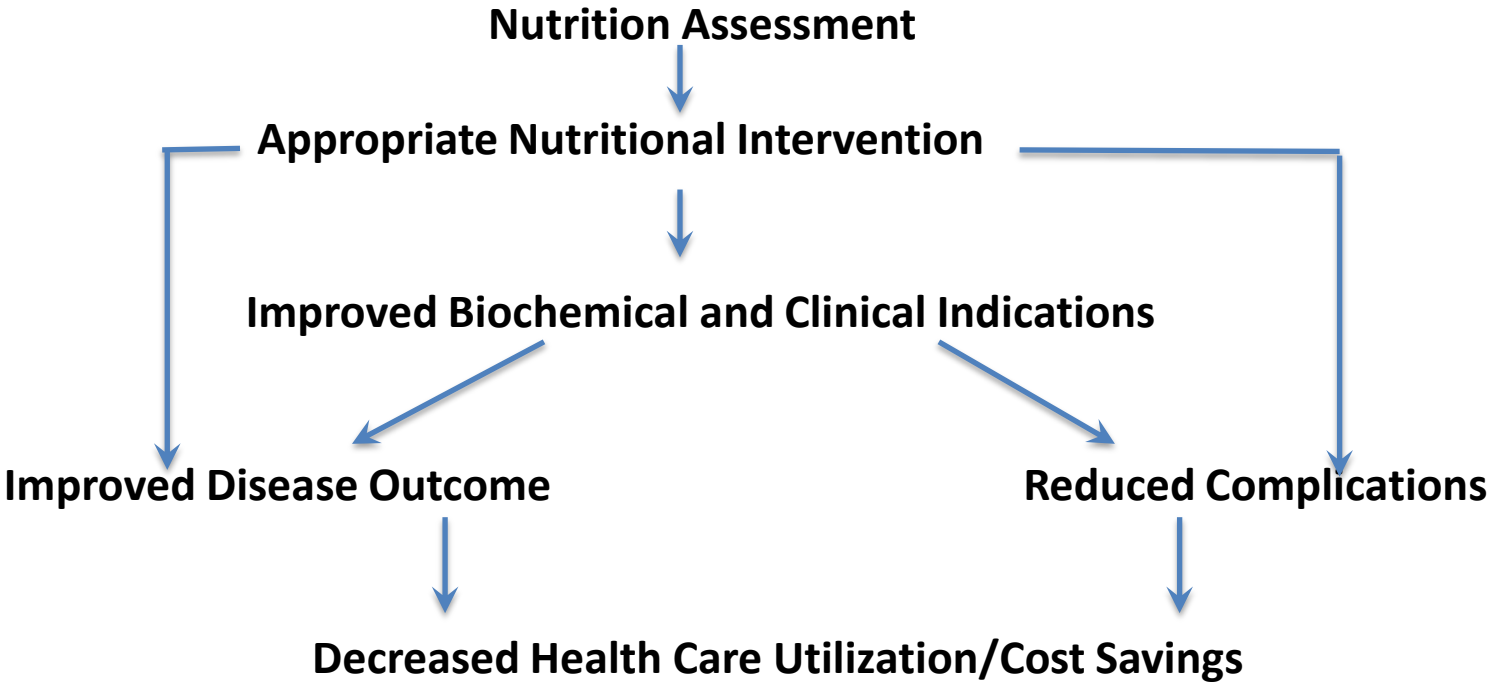
  affected by infection, inflammation

  Long half life – can not predict short term effect
- **Transferin** – sensitive and early marker.

  Pregnancy, hypoxia , hepatic disease , chronic infection alter values
- **Low serum cholesterol**
- **Thyroxine binding prealbumin**
- Assessment of Vitamines and trace elements

Intervention

Importance of Dietician Intervention

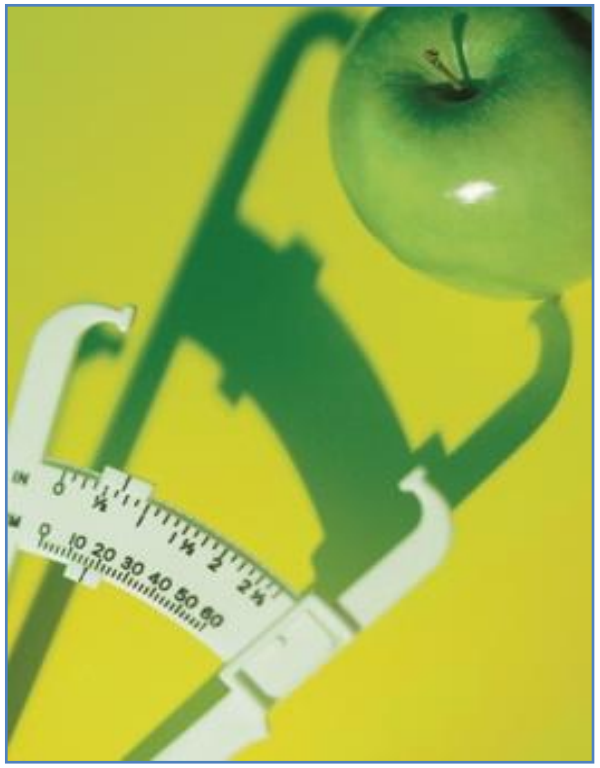


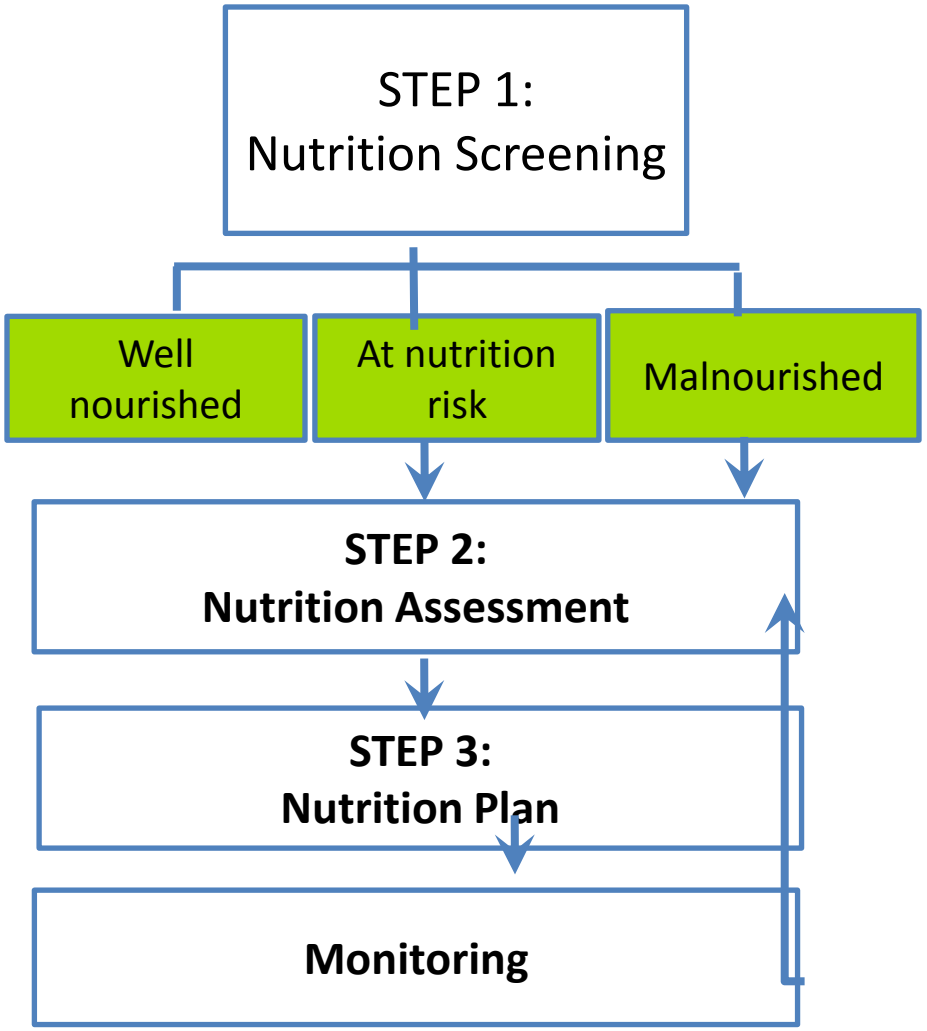
Model of the effect of nutrition intervention on outcomes and cost savings. Adapted from Mason M.ed. Cost and Benefits of Nutritional Care. Phase I. Chicago, III: American Dietetic Association; 1979

Dieticians doing an early nutrition assessment & appropriate nutrition intervention are considered essential for the delivery of quality health care.

Allred etal.Malnutrition and clinical outcomes:The case for medical nutrition therapy . Journal of American Dietetic Association. April 1996:Vol 96

Use a nutrition care pathway





Mueller C, et al. *JPEN J Parenter Enteral Nutr.* 2011;35:16-24.

How do we calculate the nutritional requirements of patients?

Calculation of BMR/calorie (mifflin-St jeor formulae)

- **Calculation of BMR**
- **Men** - 10xweight(kg) + 6.25 x height (cm) – 5x age (yr) +5
- **Women** - 10xweight(kg) + 6.25 x height (cm) – 5x age (yr) – 161
- **Calorie calculation**
- Sedentary – BMR + 20%
- Moderate worker - BMR + 30%
- Heavy worker – BMR + 40%

Guidelines for the Provision and Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine(SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N)

- Indirect Calorie-metry be used for Kcal calculations
- In absence of IC, 25-30kcal/kg/d be used
- For BMI in range of 30-50,
  - use 11-14kcal/kg/day as per actual body weight
- For BMI>50
  - use 22-25kcal/kg/day as per ideal body weight

Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) 2016

Guidelines for the Provision and Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine(SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N)

- Weight-based equations (eg, 1.2–2.0 g/kg/d) may be used to monitor adequacy of protein provision
- If BMI 30-40, protein recommendation is upto 2.0gm/kg/day as per ideal body weight
- If BMI> 40, protein recommendation is upto 2.5gm/kg/day as per ideal body weight

Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) 2016

In case patient's weight is not known

To measure using the Broca formula, you just need to know your height. No other factors play a role.

Height in centimetres - 100 = Normal weight
Normal weight - 10% = ideal weight

Based on this weight the calorie and protein is calculated for the patient

https://www.bmi3d.com/brocaformula.html accessed on 22-3-2017

Nutritional recommendation (WHO)

- Energy
- Protein – 0.9 g/kg /day
- Fat - < 30% of total calorie
- Calcium – 800 – 1200 mg/day
- Iron – 10 mg /day (if no excess iron loss)
- Selenium – 5070 microgm /day
- Zinc - male 7 mg/day , women 4.9 mg/day
- Riboflavin - 1.3 mg
- Folate – 400 microgm/day
- Vit B12 – 2.5 microgm/day
- Vit C – 60000 mg/day
- Vit A – 600700 micromg retinol
- Vit D – 1015 micromg/day
- Vit E – 100400 IU/day

Different Foods

- **Cererals - Foundation of meal**
- **Vegetables**
- **Fruites**
- **Pulses**
- **Milk and products**
- **Fish, meat , egg**
- **Oil , Ghee**
- **Salt**
- **Sugar**

Nutritional advice

- Enjoy variety of nutritious foods
- Select nutrient dense foods
- Healthy traditional vegetables
- Eat 3-4 meals /day
- Overcome chewing problem
- Take easily digestable food
- Prevent constipation
- Limit alcohol
- Food safety
- Physically active
- Food according to co-morbidity

Take Home Message

- Older adults prone to develop malnutrition
- Malnutrition increase morbidity and mortality
- Assessment of nutritional status must in elderly
- Investigate properly if weight loss >4% .
- Nutritional supplementation in high risk elderly .
- Multivitamin supplemention better if daily calorie intake < 1500 kcal /day.
- More care in hospitalized and high risk population.