Unintentional Weight Loss in Older Adults

Grand Rounds 5/24/22

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Case of Ms. T

- 85 year old woman with history of severe dementia, L sided CVA with R hemiplegia, hypertension and an approx. 6 month history of decline and weight loss.
- The patient was admitted with one week history of progressive weakness, mental status changes and decrease oral intake
- Exam showed BP 110/55, HR 90. Lethargic, non-verbal, does not follow commands. R sided hemiplegia. No other findings
- Labs: Normal CBC with diff. Chem-10: Na 150 and Creatinine 1.3 (baseline 0.8-0.9)
- 24/7 private paid HHA. Large family and very supportive. No advanced directives.

Why is this important?

- Unintended weight loss is thereby an important indicator of malnutrition, representing a situation in which energy requirements are not met
- Malnutrition in older adults has been recognized as a challenging health concern
- It is associated with increased mortality and morbidity, but also with physical decline, which has wide ranging acute implications for activities of daily living and quality of life in general
- Malnutrition is common and may also contribute to the development of the geriatric syndromes in older adults

What is clinically significant?

- ≥ 2 percent decrease of baseline body weight in one month
- ≥ 5 percent decrease in three months OR
- ≥ 10 percent in six months

Prevalence

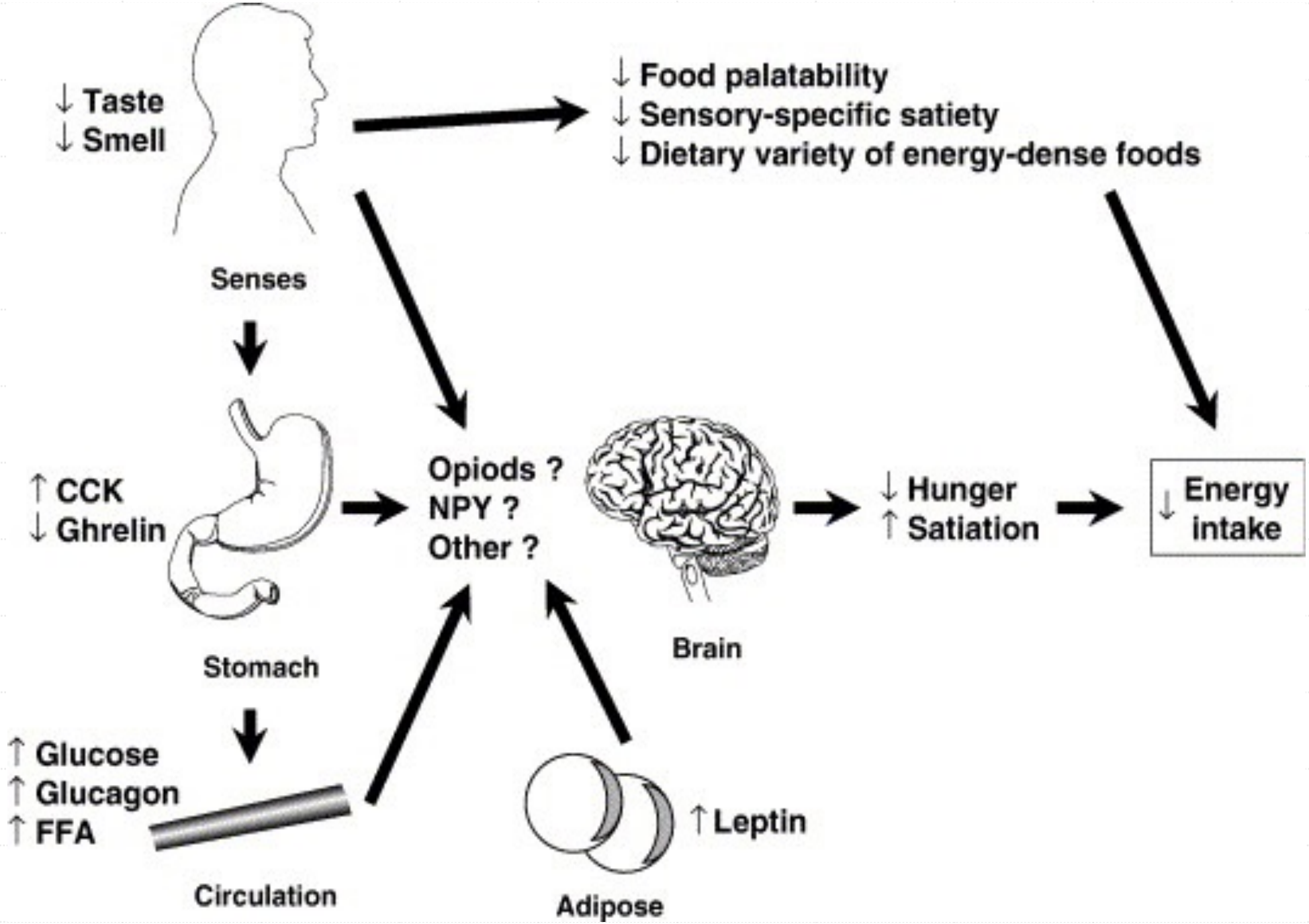
- In clinical practice, it is encountered in up to 8% of all adult outpatients-and 27% of frail people 65 years and older
- 50% of patients with dementia that are admitted to long-term care facilities
- 30% of patients with mild-moderate AD that live at home
- Weight loss is an important risk factor in elderly patients, as it is associated with increased mortality, which can range from 9% to as high as 38% within 1 to 2.5 years after weight loss has occurred

Effects of involuntary weight loss

- Increased frailty and mortality (9-38% within 1-3years)
- Increased hospital admissions and increased risk of in-hospital complications
- Increased falls and injuries from falls
- Impaired cell-mediate and humoral immune response with increased rate of infections
- Loss of lean body mass with impaired skeletal muscle, cardiac muscle and respiratory function
- Delayed wound healing
- Decreased functional ability and ADLs
- Higher rates of admission to hospitals
- Poorer quality of life

Causes of weight loss in older adults

- Physiological
- Medical
- Functional
- Psychological
- Social


↓ Taste
↓ Smell
Senses
↓ Food palatability
↓ Sensory-specific satiety
↓ Dietary variety of energy-dense foods
↑ CCK
↓ Ghrelin
Stomach
Opiods ?
NPY ?
Other ?
Brain
↓ Hunger
↑ Satiation
↓ Energy intake
↑ Glucose
↑ Glucagon
↑ FFA
Circulation
↑ Leptin
Adipose

Medical causes of weight loss

- Malignancy
- Infectious
  - Bacterial, Tb, fungal, parasitic
- Inflammation
  - Autoimmune diseases
- Endocrine
  - DM, hypo/hyperthyroid, Adrenal Insufficiency
- Organ Failure
  - CHF, CRI, COPD, etc
- Medication Side Effects
- Deficiencies
  - B12, Folate, Iron, Thiamine

Medication side effects that contribute to weight loss

Anorexia	Antibiotics, anticonvulsants, digoxin, metformin, SSRIs, etc.
Dry mouth	Anticholinergics, antihistamines, diuretics, clonidine
Dysgeusia/dysosmia	ACEI, antibiotics, anticholinergics, calcium channel blockers, etc.
Nausea/vomiting	Antibiotics, digoxin, hormone replacement, iron, potassium, SSRIs, statins, etc.

Functional causes of weight loss

- Immobility
- Arthritis
- Stroke
- Parkinson's
- Dental
- Vision
- Hearing

Psychological causes of weight loss

- Depression
- Psychosis
- Grief/Bereavement
- Intentional
- Alcoholism
- Dementia
- Anorexia nervosa/anorexia tardive

Social causes of weight loss

- Poverty
- Isolation
- Neglect
- Abuse
- Caregiver fatigue

Determinants of Incident Malnutrition in Community-Dwelling Older Adults: A MaNuEL Multicohort Meta-Analysis

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Determinants of Incident Malnutrition in Community-Dwelling Older Adults continued

- meta-analysis, which is a part of the Joint Action Malnutrition in the Elderly Knowledge Hub (MaNuEL) of the European Joint Programming Initiative A Healthy Diet for a Healthy Life (JPI-HDHL)
- Individually analyzed longitudinal studies (included 6 studies) from MaNuEL partners
- Participants: Community-dwelling adults aged 65 and older with information on nutritional status at baseline and follow-up were included

Table 1. Selection Process for Inclusion of Community-Dwelling Older Adults from Each Study (number of participants)

Process	ErnSiPP	LiLACS NZ	LASA	ActiFe	TILDA	KORA-Age
Participants at baseline	353	937	2,545	1,506	8,504	1,079
Exclusion criteria[a]						
Aged < 65	0	0	1,039	0	4,990	0
Information missing on BMI or previous weight loss at baseline	18	313	27	36	1,156	4
Malnutrition at baseline[c]	46	43	133	17	226	61
Lost to follow-up	35	127	151	N/A[b]	222	159
Died during follow-up	32	105	169	130	N/A[b]	98
Missing BMI or weight at follow-up	6	41	17	532	69	9
Māori participants	N/A	99	N/A	N/A	N/A	N/A
Participants included in analysis	216	209	1,009	791	1841	778

[a]Participants were excluded in presented order.

[b]Participants were removed before the dataset was received for analysis.

[c]Body mass index (BMI) < 20 kg/m^2 or weight loss > 3 kg in the last 3 months (ErnSiPP, ActiFe), ≥ 4 kg (LASA) and > 5 kg LiLACS, (LiLACS NZ, KORA Age) in the past 6 months, and > 4.5 kg in the past 12 months (TILDA) (See text for full study names)

N/A = not applicable

Results

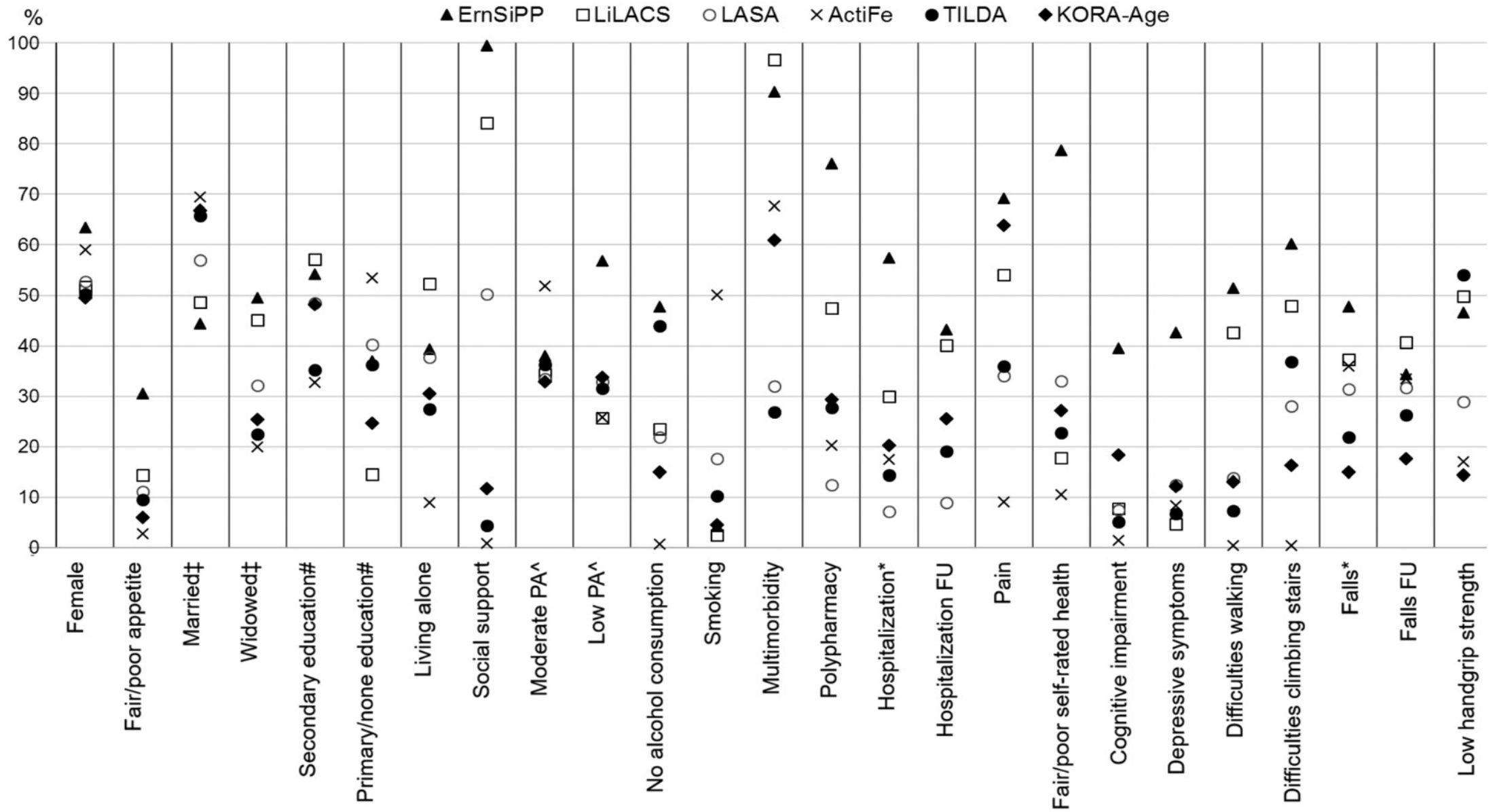


Figure 1. Prevalence of potential determinants of incident malnutrition, separated according to study. ‡Third category 'unmarried/divorced' is not presented—all three categories add up to 100%. #Third category 'tertiary education' is not presented—all three categories add up to 100%. ^Third category 'high physical activity' is not presented—all three categories add up to 100%. *Before baseline. FU = follow-up; PA = physical activity.

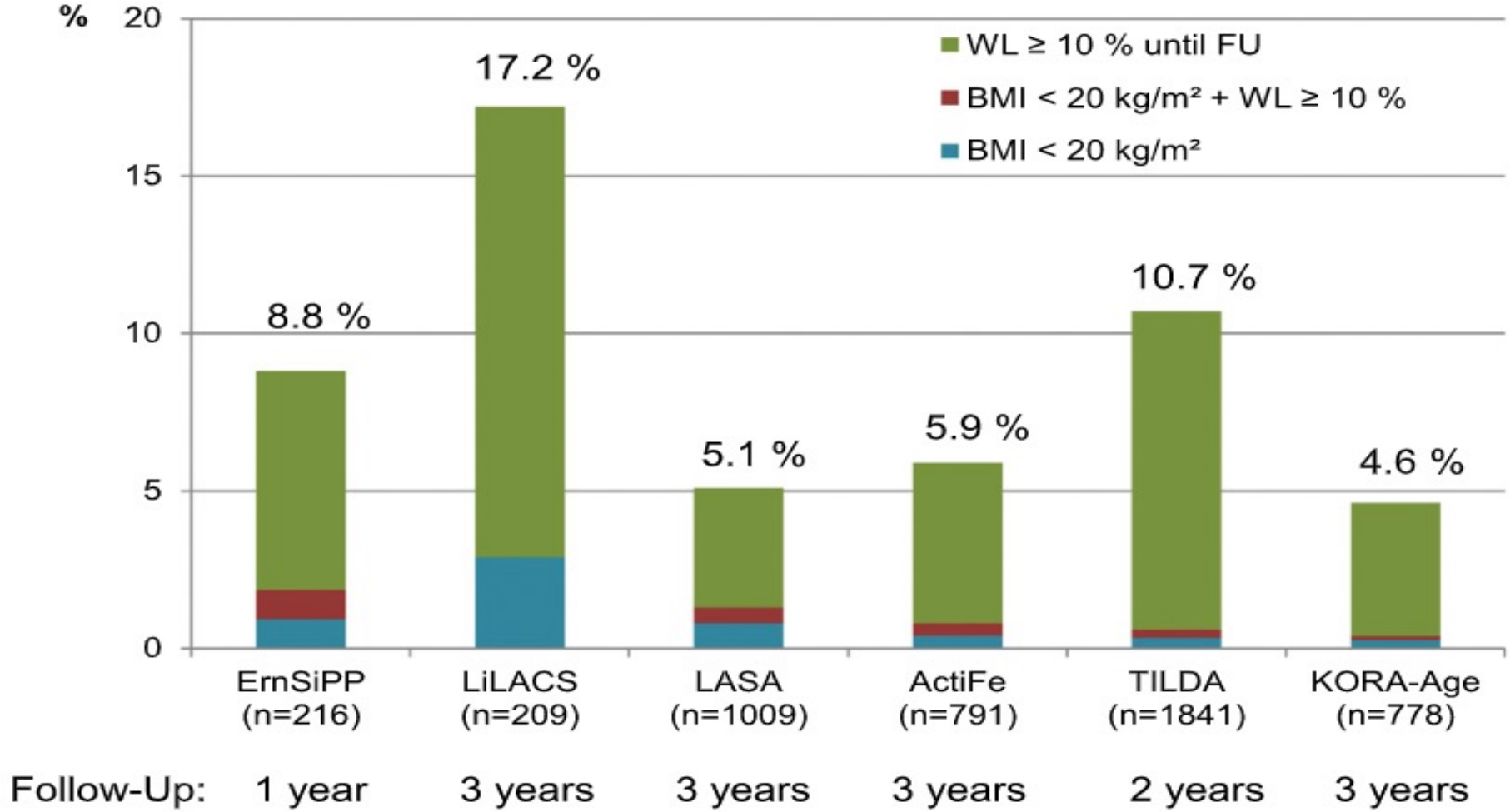
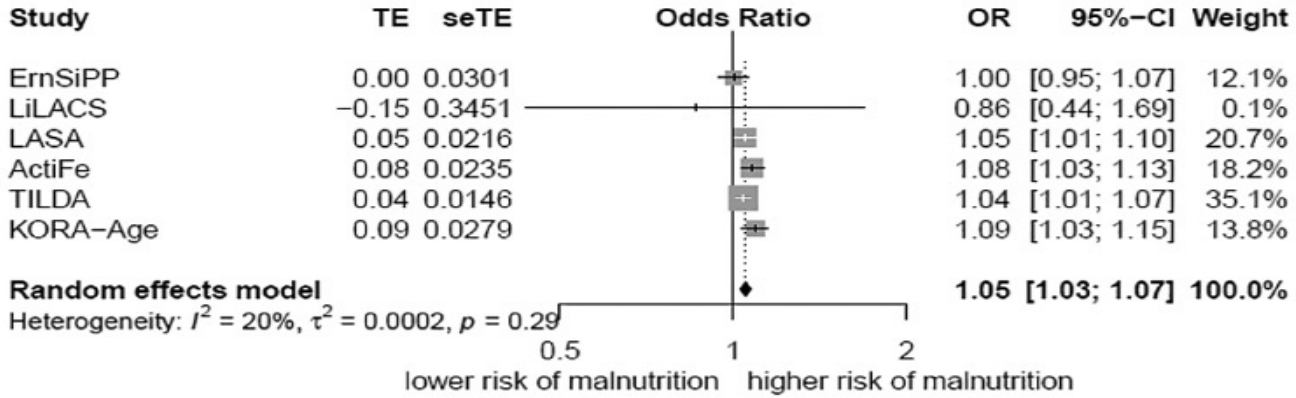
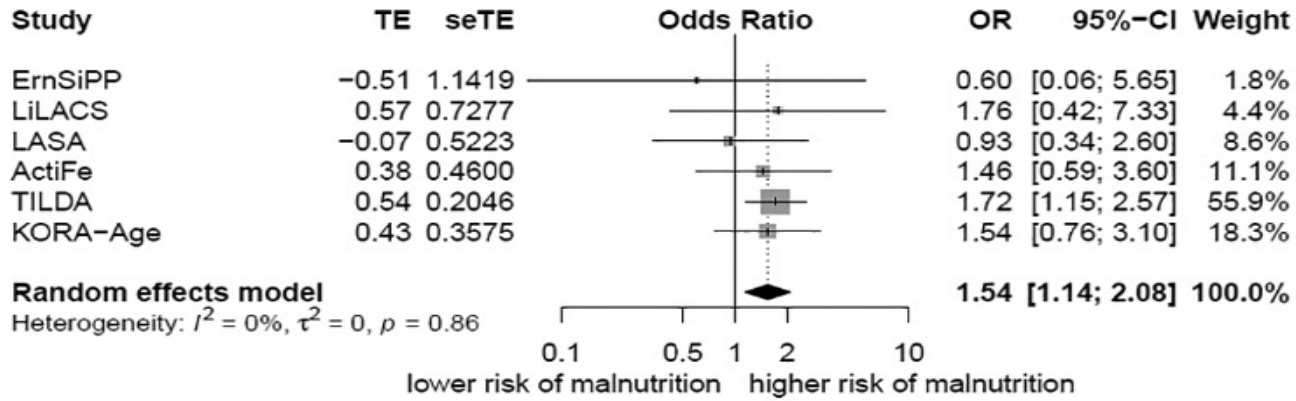


Figure 2. Incidence of malnutrition in each cohort. Malnutrition was defined as body mass index (BMI) < 20 kg/m^2 or unintended weight loss (WL) ≥ 10% until follow-up (FU). (see text for full study names)

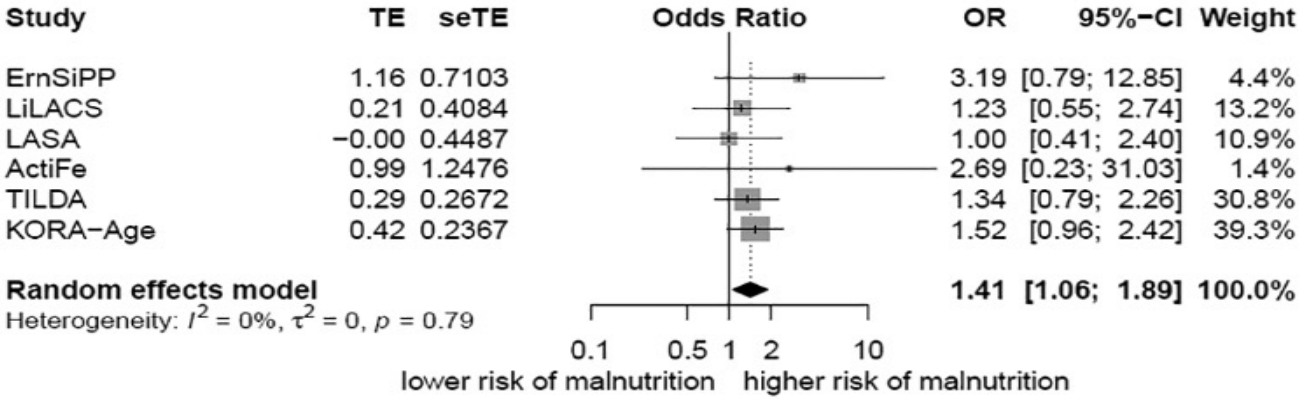
A


Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP 0.00 0.0301 1.00 [0.95; 1.07] 12.1%
LiLACS −0.15 0.3451 0.86 [0.44; 1.69] 0.1%
LASA 0.05 0.0216 1.05 [1.01; 1.10] 20.7%
ActiFe 0.08 0.0235 1.08 [1.03; 1.13] 18.2%
TILDA 0.04 0.0146 1.04 [1.01; 1.07] 35.1%
KORA−Age 0.09 0.0279 1.09 [1.03; 1.15] 13.8%
Random effects model 1.05 [1.03; 1.07] 100.0%
Heterogeneity: I^2 = 20%, τ^2 = 0.0002, p = 0.29
0.5
1
2
lower risk of malnutrition
higher risk of malnutrition

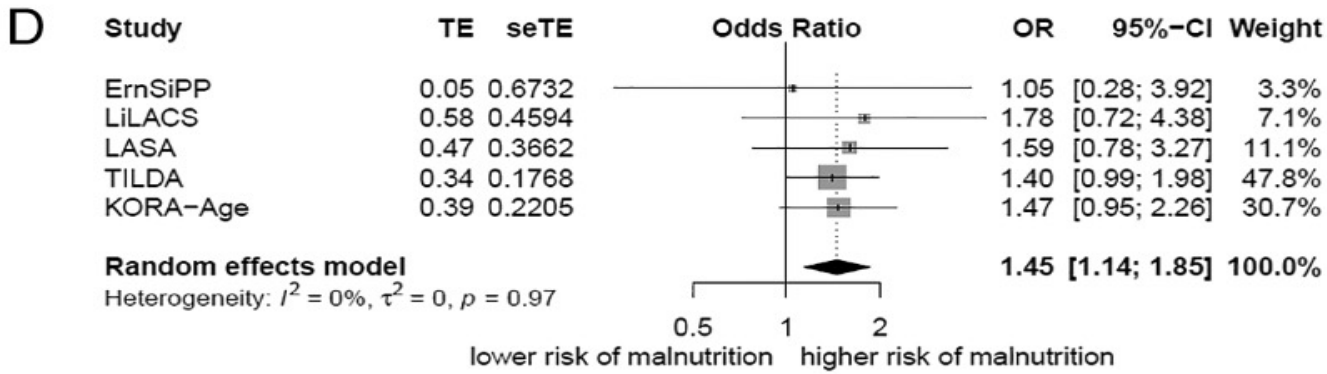
B


Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP −0.51 1.1419 0.60 [0.06; 5.65] 1.8%
LiLACS 0.57 0.7277 1.76 [0.42; 7.33] 4.4%
LASA −0.07 0.5223 0.93 [0.34; 2.60] 8.6%
ActiFe 0.38 0.4600 1.46 [0.59; 3.60] 11.1%
TILDA 0.54 0.2046 1.72 [1.15; 2.57] 55.9%
KORA−Age 0.43 0.3575 1.54 [0.76; 3.10] 18.3%
Random effects model 1.54 [1.14; 2.08] 100.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.86
0.1
0.5
1
2
10
lower risk of malnutrition
higher risk of malnutrition

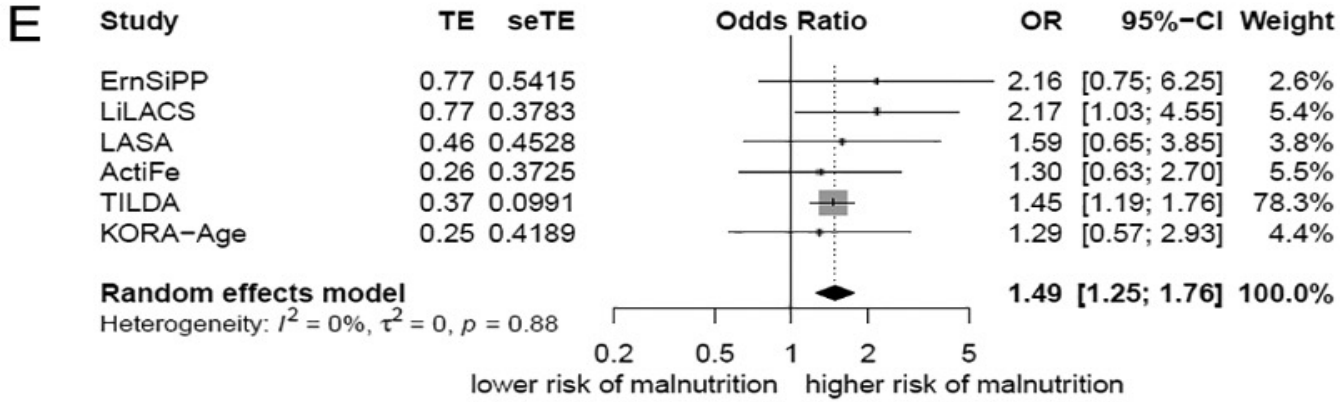
C


Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP 1.16 0.7103 3.19 [0.79; 12.85] 4.4%
LiLACS 0.21 0.4084 1.23 [0.55; 2.74] 13.2%
LASA −0.00 0.4487 1.00 [0.41; 2.40] 10.9%
ActiFe 0.99 1.2476 2.69 [0.23; 31.03] 1.4%
TILDA 0.29 0.2672 1.34 [0.79; 2.26] 30.8%
KORA−Age 0.42 0.2367 1.52 [0.96; 2.42] 39.3%
Random effects model 1.41 [1.06; 1.89] 100.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.79
0.1
0.5
1
2
10
lower risk of malnutrition
higher risk of malnutrition

D


Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP 0.05 0.6732 1.05 [0.28; 3.92] 3.3%
LiLACS 0.58 0.4594 1.78 [0.72; 4.38] 7.1%
LASA 0.47 0.3662 1.59 [0.78; 3.27] 11.1%
TILDA 0.34 0.1768 1.40 [0.99; 1.98] 47.8%
KORA−Age 0.39 0.2205 1.47 [0.95; 2.26] 30.7%
Random effects model 1.45 [1.14; 1.85] 100.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.97
0.5 1 2
lower risk of malnutrition higher risk of malnutrition

E


Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP 0.77 0.5415 2.16 [0.75; 6.25] 2.6%
LiLACS 0.77 0.3783 2.17 [1.03; 4.55] 5.4%
LASA 0.46 0.4528 1.59 [0.65; 3.85] 3.8%
ActiFe 0.26 0.3725 1.30 [0.63; 2.70] 5.5%
TILDA 0.37 0.0991 1.45 [1.19; 1.76] 78.3%
KORA−Age 0.25 0.4189 1.29 [0.57; 2.93] 4.4%
Random effects model 1.49 [1.25; 1.76] 100.0%
Heterogeneity: I^2 = 0%, τ^2 = 0, p = 0.88
0.2 0.5 1 2 5
lower risk of malnutrition higher risk of malnutrition

F

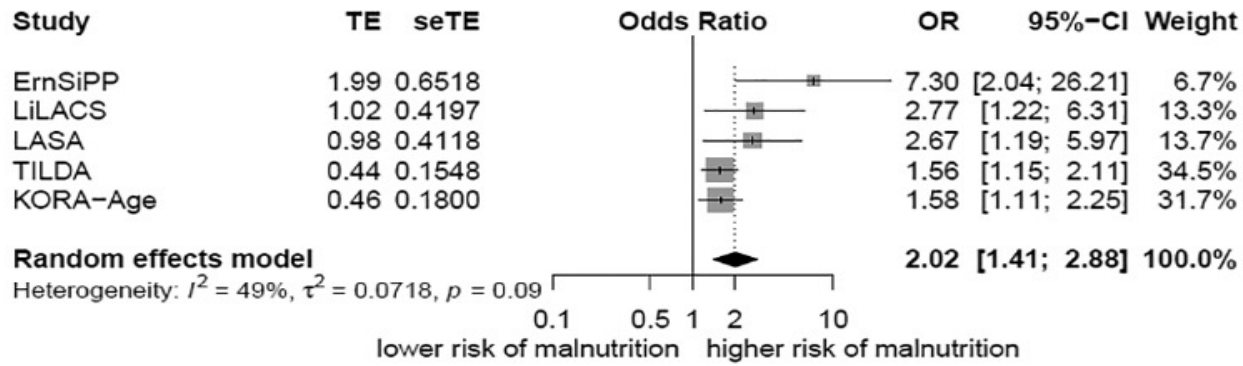

Study TE seTE Odds Ratio OR 95%−CI Weight
ErnSiPP 1.99 0.6518 7.30 [2.04; 26.21] 6.7%
LiLACS 1.02 0.4197 2.77 [1.22; 6.31] 13.3%
LASA 0.98 0.4118 2.67 [1.19; 5.97] 13.7%
TILDA 0.44 0.1548 1.56 [1.15; 2.11] 34.5%
KORA−Age 0.46 0.1800 1.58 [1.11; 2.25] 31.7%
Random effects model 2.02 [1.41; 2.88] 100.0%
Heterogeneity: I^2 = 49%, τ^2 = 0.0718, p = 0.09
0.1 0.5 1 2 10
lower risk of malnutrition higher risk of malnutrition

Table 2. Random-Effects Meta-Analyses of All Adjusted Potential Determinants Not Significantly Related to Incidence of Malnutrition

Determinant	Odds Ratio (95% Confidence Interval)	Heterogeneity	
		I^2, %	Tau^2
Female	1.25 (0.97–1.63)	20	0.02
Appetite fair to poor (reference good)	1.12 (0.72–1.72)	35	0.10
Married (reference widowed)	0.97 (0.71–1.33)	41	0.06
Education (reference tertiary)			
Secondary	0.79 (0.59–1.06)	4	0.01
≤Primary	0.73 (0.52–1.03)	14	0.03
Living alone	0.98 (0.71–1.33)	30	0.05
Social support	1.13 (0.74–1.71)	36	0.08
Physical activity (reference high)			
Moderate	1.30 (0.95–1.80)	21	0.03
Low	1.05 (0.68–1.61)	45	0.12
Alcohol consumption	0.88 (0.57–1.38)	58	0.15
Smoking	1.07 (0.78–1.46)	0	0.00
≤1 chronic diseases	1.16 (0.64–2.12)	93	0.40
< 5 medications	1.13 (0.91–1.41)	0	0.00
Pain	1.08 (0.88–1.34)	0	0.00
Self-rated health fair or poor (reference very good or good)	1.23 (0.87–1.73)	37	0.06
Cognitive impairment	1.37 (0.95–1.97)	17	0.04
Depressive symptoms	1.03 (0.59–1.79)	53	0.22
Falls before baseline	1.10 (0.86–1.40)	0	0.00
Falls during follow-up	1.18 (0.86–1.61)	46	0.07
Handgrip strength low (reference normal)	1.09 (0.68–1.73)	70	0.21

Meta-analysis is based on 6 longitudinal cohort studies with 216, 209, 1,009, 1,841, 791, and 778 participants, respectively.
List of confounders used to adjust the associations presented in Supplemental Table S3.

Discussion

- In addition to age and marital status, difficulty walking and climbing stairs, prior hospitalization, and hospitalization during follow-up were identified as determinants of incident malnutrition
- Should these be considered in screening tool to identify older adults at high risk of developing malnutrition?

Evaluation of weight loss

- Document the weight loss
- Body fat and lean muscle mass may be estimated using measures such as mean upper arm circumference (MUAC) or mid-arm circumference. MUAC measures the circumference of the left upper arm at the mid-point between the tip of the shoulder and the tip of the elbow (olecranon process and the acromion).
- MUAC of less than 22 cm for women and 23 cm for men are suggestive of chronic energy deficiency
- Although suggestive of malnutrition, it is unclear whether MUAC predicts mortality and morbidity

Evaluation continued

- Evaluate appetite and dietary intake
- Determine if there has been a change in hunger and satiety may provide more clinically revealing information than performing a formal dietary recall
- Patients should be questioned regarding appetite, their dietary intake in relation to their usual pattern, the number of meals they consume per day, portion size, snacks between meals, if and when they feel full during their meal, and whether the patient likes what they are eating

Evaluation continued

- Perform a complete history, including oral symptoms, and physical examination, including a complete oral examination.
- laboratory evaluation for evidence of metabolic or inflammatory disease, to include a basic chemistry profile including glucose and electrolytes, thyroid-stimulating hormone (TSH), complete blood count (CBC)

Non-pharmacologic treatment

- Minimize dietary restrictions
- Optimize energy intake
  - High energy foods at the best meal of the day
  - Smaller meals more often (eat with the clock not your appetite)
  - Favorite foods and snacks
- Optimize and vary dietary texture
- Make sure that feeding or shopping assistance is available, if appropriate
- Increase the nutrient density of food (e.g. increase protein content by adding milk powder, whey protein)
- Ensure adequate oral hygiene and health
- Eat in company or with assistance, hand-feed the patient
- Use flavor enhancers, maximize taste and smell
- Use community nutritional support services
- Minimize aspiration risk

Non-pharmacologic treatment cont.

- Address dental issues such as oral pain and poor denture fit
- Assess dysphagia and provide an appropriate diet if present
- Decrease pill burden by reducing the number and frequency of medications
- Treat depression if appropriate

High-calorie supplements

- The American Geriatrics Society's "Choosing Wisely" initiative advises to avoid the use of high-calorie supplements for treatment of cachexia in older adults
- Although high-calorie supplements increase weight in older people, there is no evidence that they affect other important clinical outcomes, such as quality of life, mood, functional status or survival
- In a meta-analysis of trials in older adults, protein and energy supplements yielded a 2.2 percent gain in weight and a small mortality benefit among those who were undernourished but no improvement in function or decrease in hospital length of stay

Multivitamin use

- MVI supplementation has been recommended for older adults who are more likely to have compromised nutritional status (such as those in the long-term care setting), to help achieve recommended intakes of certain micronutrients. However, the evidence is weak

Pharmacologic treatment

- appetite stimulants: megestrol acetate, dronabinol, mirtazapine, ghrelin mimetics (growth hormone secretagogues)

Megestrol acetate

- A progestational agent, has demonstrated some weight gain and improved appetite in patients with cancer or acquired immunodeficiency syndrome (AIDS) cachexia
- In a randomized trial, megestrol acetate 800 mg daily for 12 weeks improved appetite and sense of wellbeing in a group of nursing home residents. However, weight gain was not found to be significant (>4 lbs) until three months after treatment
- Adverse effects: patients should be monitored for edema/fluid retention, adrenal insufficiency, deep venous thrombosis, and muscle weakness
- The use of megestrol in older adult nursing home residents has been associated with increase in all-cause mortality without increase in weight
- On Beer's criteria list megestrol acetate as potentially inappropriate for patients 65 years and older

Dronabinol

- Dronabinol has not been well-studied in older adults
- One nonrandomized trial showed that dronabinol may be useful for anorexia, weight gain, and behavior problems in patients with advanced Alzheimer disease who were refusing food
- Adverse effects: delirium, abdominal pain, nausea, ataxia

Mirtazapine

- an antidepressant that leads to more weight gain than selective serotonin reuptake inhibitor (SSRI) antidepressants
- Few studies have been specifically performed to evaluate its impact on weight among older adults with weight loss.
- Two studies in nursing home residents did not show conclusive benefit for mirtazapine over other non-tricyclic antidepressants
- However, a retrospective study in patients with Alzheimer disease and weight loss found that patients treated with mirtazapine for three months gained an average of 2 kg compared with baseline
- Adverse effects: constipation, drowsiness, increased serum cholesterol

Ghrelin

- Ghrelin is an endogenous growth hormone secretagogues (GHS) that has been shown to stimulate appetite and increase fat-free mass
- Two randomized trials of GHS in healthy older adults demonstrated increases in lean mass (average gain of 1.6 kg), and improvements in strength and function compared with placebo.
- Adverse effects of ghrelin mimetics include hyperglycemia, dizziness, and nausea

So what do we do with Ms. T?

Care for Ms. T

- Enlist a multidisciplinary team (eg, social worker, dietitian, dentist, physical, occupational, and speech therapists) as needed to address contributing factors
- Focus on non-pharmacologic treatments
- No difference in mortality rates among PEG vs. hand-fed demented patients
- Even with the best of care, Ms. T's weight loss and functional decline may not be intervenable or may not improve depending on the underlying disease state and comorbidities, in which case could consider hospice/palliative care intervention

References

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