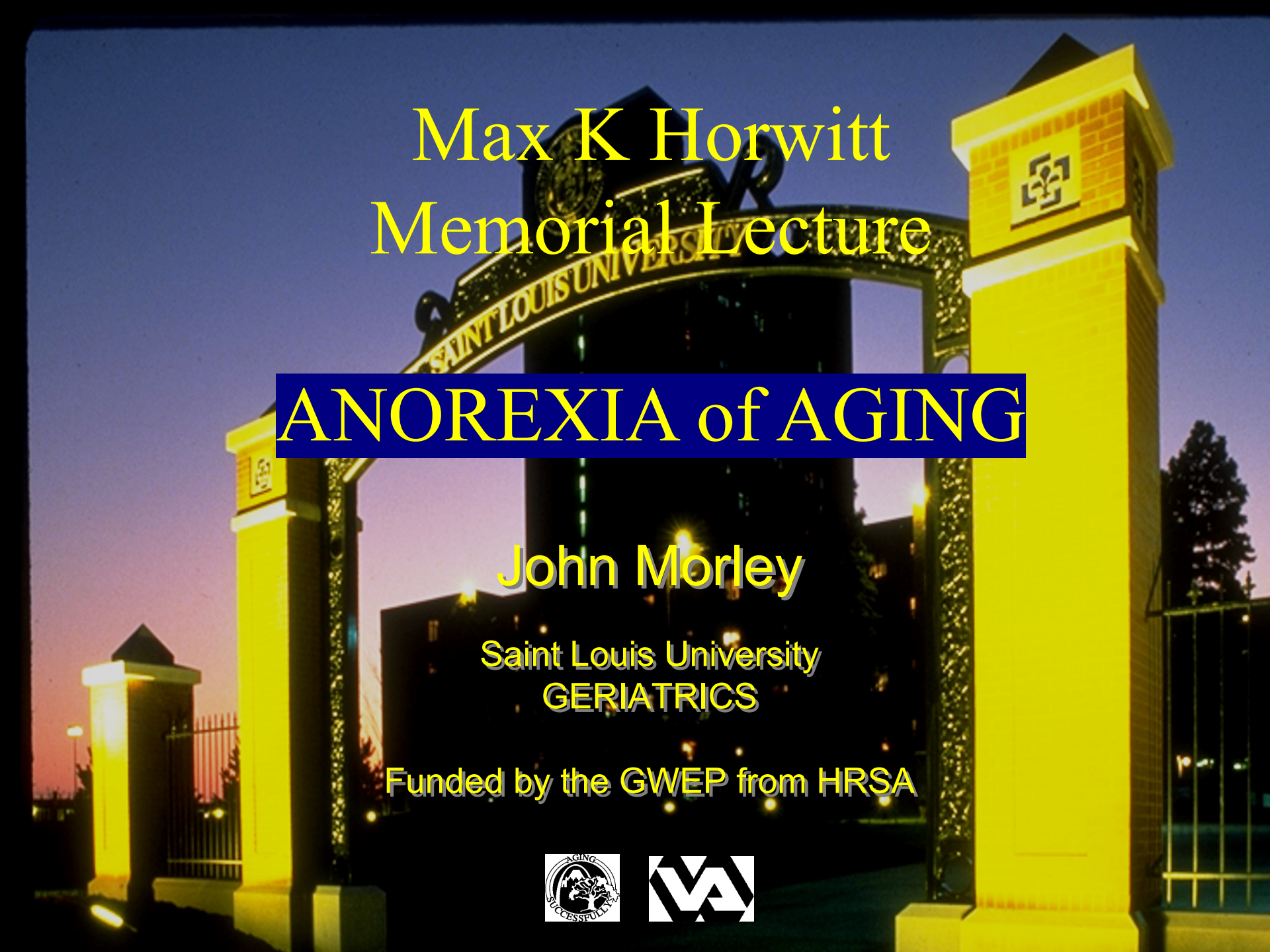


Max K Horwitt Memorial Lecture

ANOREXIA of AGING

John Morley

Saint Louis University
GERIATRICS

Funded by the GWEP from HRSA

Max K. Horwitt

SLU professor emeritus

Max Kenneth Horwitt, a professor emeritus at St. Louis University Medical School, died Tuesday (Aug. 1, 2000) at Missouri Baptist Medical Center in Town and Country after suffering a heart attack. He was 92 and lived in Brentwood.

Professor Horwitt taught biochemistry at St. Louis University from 1968 until he retired in 1976. His primary interest was in research of the human requirement of vitamins and other essential nutrients.

After retiring, he continued to teach part time until his death. Earlier, he was a professor at the University of Illinois Medical School in Chicago.

He wrote more than 200 articles for scientific journals and was a member of many professional groups. He was the recipient of many awards for scientific research including the Osborne and Mendel Award from the American Institute of Nutrition in 1961.

Professor Horwitt was born in New York. He graduated from Dartmouth College in 1930 and earned a doctorate from Yale University.

Although he was known internationally as a research scientist, he didn't receive his high school diploma until 1989, when he was 80 years old. He had dropped out of school to work and save money to go to college. After taking college courses at night, he was admitted to Syracuse University, later transferring to Dartmouth.

A memorial service will be at 10 a.m. Friday at Shaare Emeth Congregation, 11643 Ladue Road, Creve Coeur. The body will be cremated.

Among the survivors are his wife, Mildred Gad Weltman Horwitt; four daughters, Ruth Singer and Sharon Weitzman Soltman, both of Evanston, Ill., Mary Goldman of Placitas, N.M., and Judy Kramer of Creve Coeur; a son, Charles Weitzman of Edwardsville; a sister, Lillian Levine of Delray Beach, Fla.; 10 grandchildren; and three great-grandchildren.

Horwitt
taught biochemistry

Am J Clin Nutr
1974 Oct;27(10):1182-93. doi: 10.1093/ajcn/27.8.1182.
Status of human requirements for vitamin E
M K Horwitt

Am J Clin Nutr
2001 Jun;73(6):1003-5. doi: 10.1093/ajcn/73.6.1003.
Critique of the requirement for vitamin E
M K Horwitt 1

“To a man with an empty stomach food is God”

Mahatma Ghandi

…is the key to survival

The ability to expend energy depends on intake

"… habeoque senectuti magnam gratiam, quae mihi sermonis aviditatem auxit, potionis et cibi sustulit."

Cicero

Cato Maior De Senectute, XIV, 46

Anorexia Independently Predicts Mortality

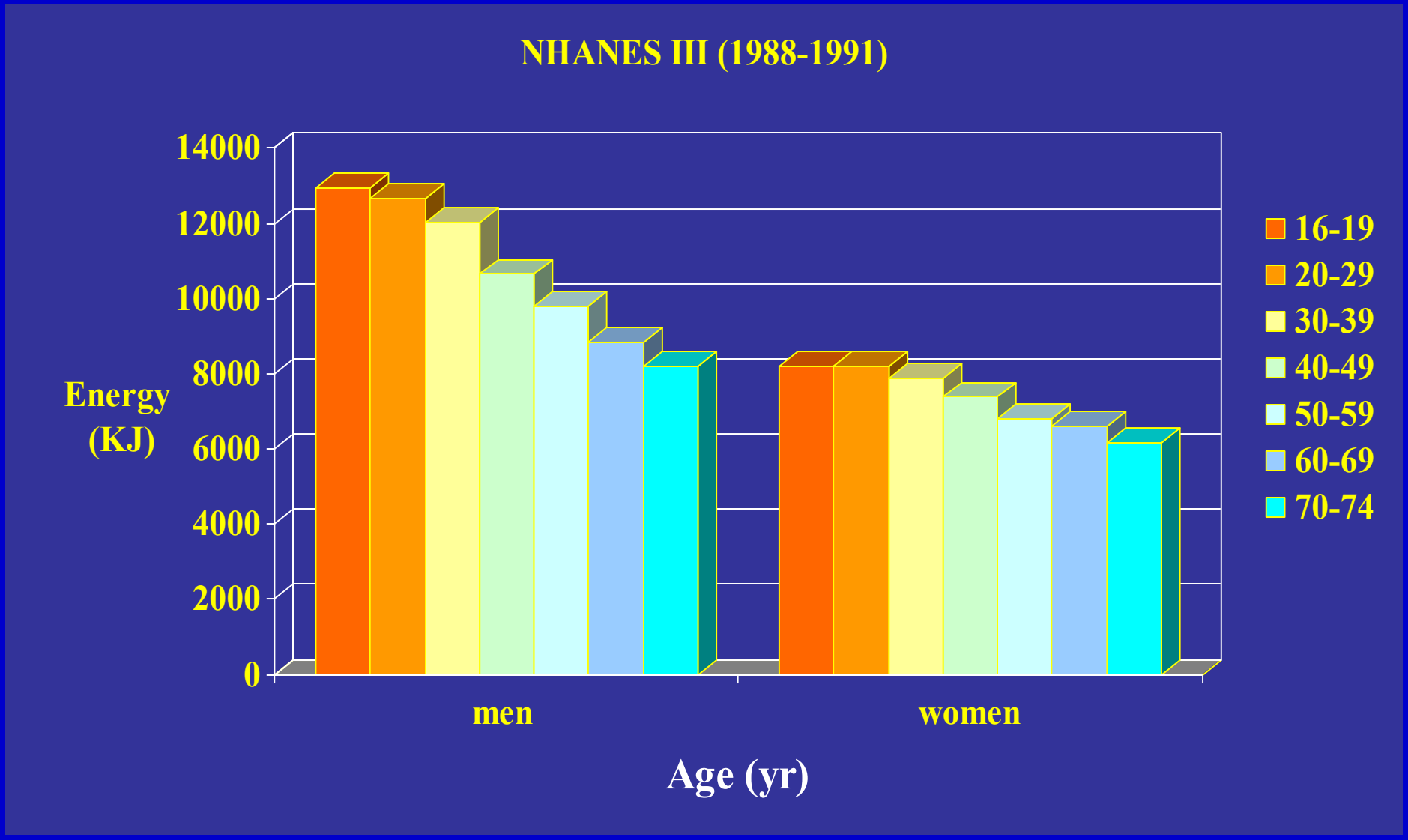
Hazard Ratio 2.9 (1.1-7.4)

Cornali et al JAGS 53 354, 2005

REASONS WHY WEIGHT LOSS IS BAD FOR OLDER PERSONS

- Protein energy malnutrition
- Harbinger of occult disease
- "Fat frail" or "Obese Sarcopenic"
- Lipolysis,lipids and atherosclerosis
- The poisonous infusion
- Altered drug effects

Changes in energy (food) intake with aging

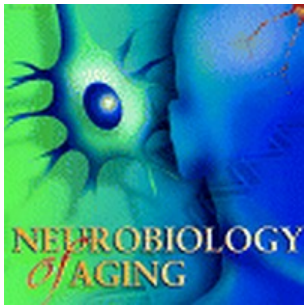


Anorexia of Aging
Geriatric Anorexia

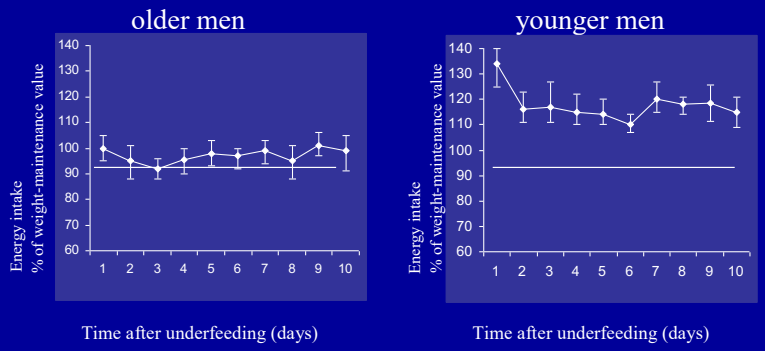
- Neurobiol Aging
- . Jan-Feb 1988;9(1):9-16. doi: 10.1016/s0197-4580(88)80004-6.

Anorexia in the elderly

- J E Morley , A J Silver



Impaired regulation of energy intake with aging:
Feeding response to underfeeding for previous 21 days



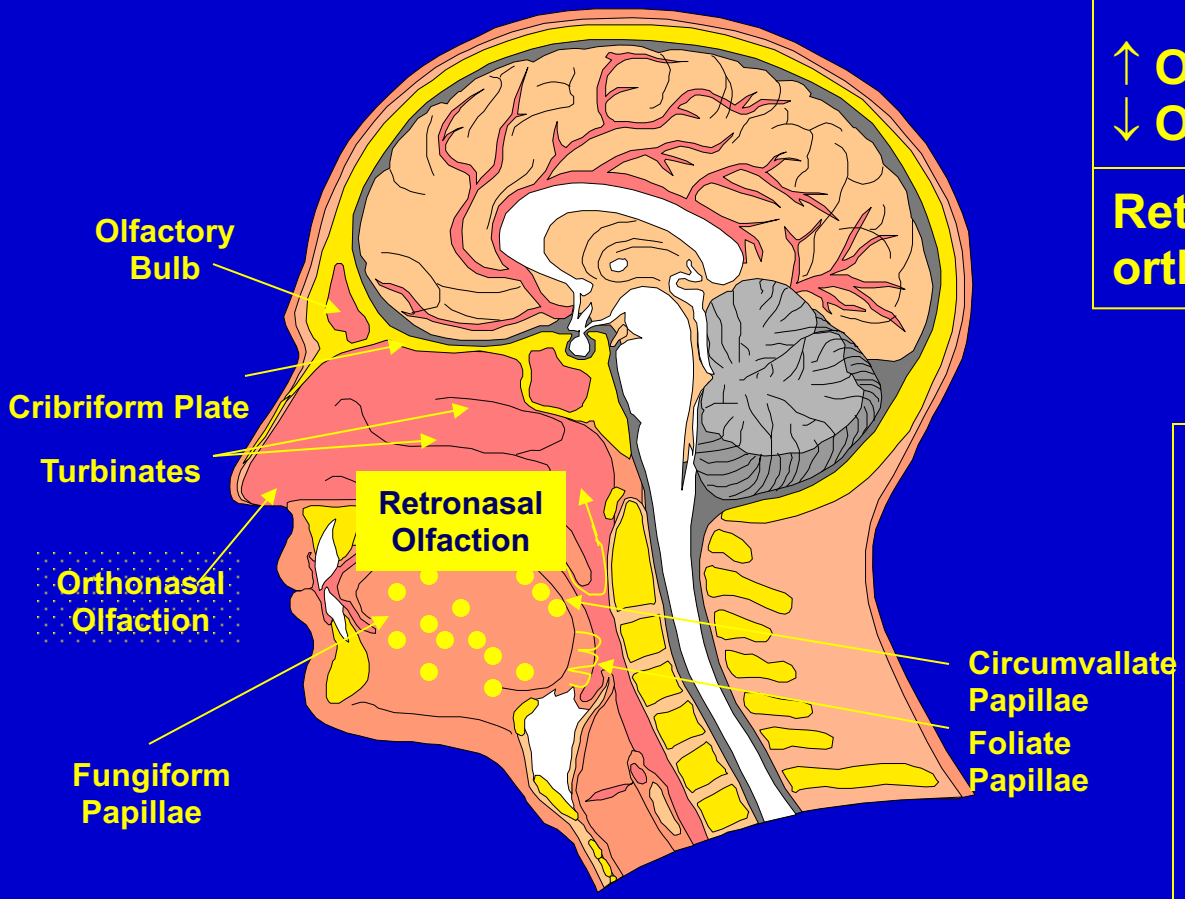
(Roberts et al,1994)

Caregiver burden is associated with weight loss

Brocker et al,Rev de Medecine Interne 24:314S,2003

Reviere et al,Int J Ger Psych 17:950,2002

Effects of Aging on Taste and Smell



OLFACTION

↑ Odor threshold
↓ Odor identification

Retronasal worse than orthonasal olfaction

TASTE

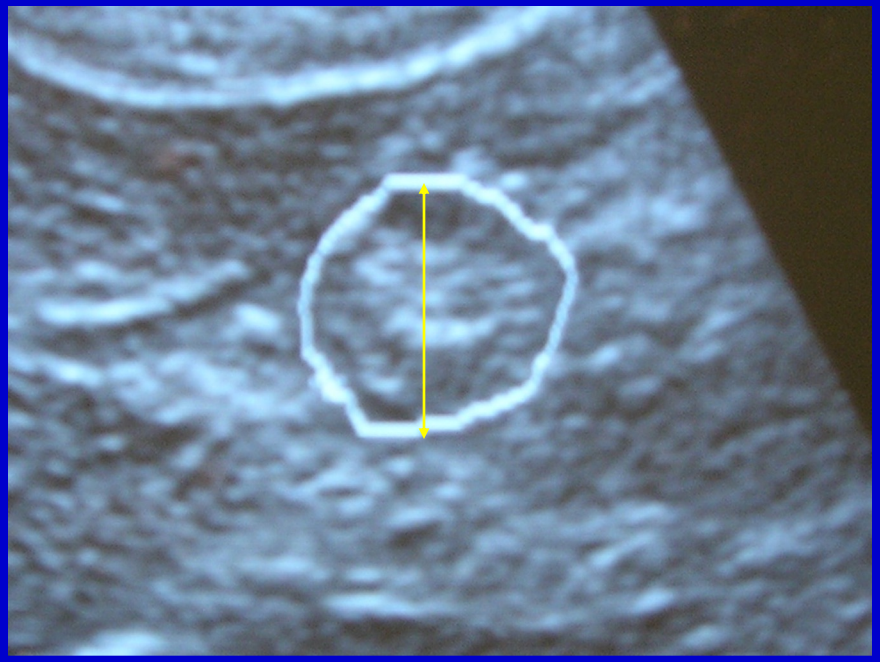
- ↑ Taste threshold
- Difficulty in recognizing taste mixtures
- Minimal change in taste thresholds
- Decreased number of supertasters
- ↑ Perception irritating tastes
- No change in temperature or tactile sensation

Results

Variable	Experimental group (n=36)	Control group (n=31)
Energy intake (MJ)		
Baseline*	6.0 (1.5)	6.0 (1.6)
*Change**	*-0.2(1.1)*	*-0.4 (1.2)†*
Daily feeling of hunger		
Baseline score*	29.3 (7.5)	33.2 (7.4)
*Change**	*3.0 (4.3)†‡*	*-0.3(5.8)*
Body weight (kg)		
Baseline*	72.0 (17.5)	69.0 (17.0)
*Change**	*1.1 (1.3) †‡*	*-0.4(1.6)*

Means (SD), † sign. change within group; ‡ sign. change between groups

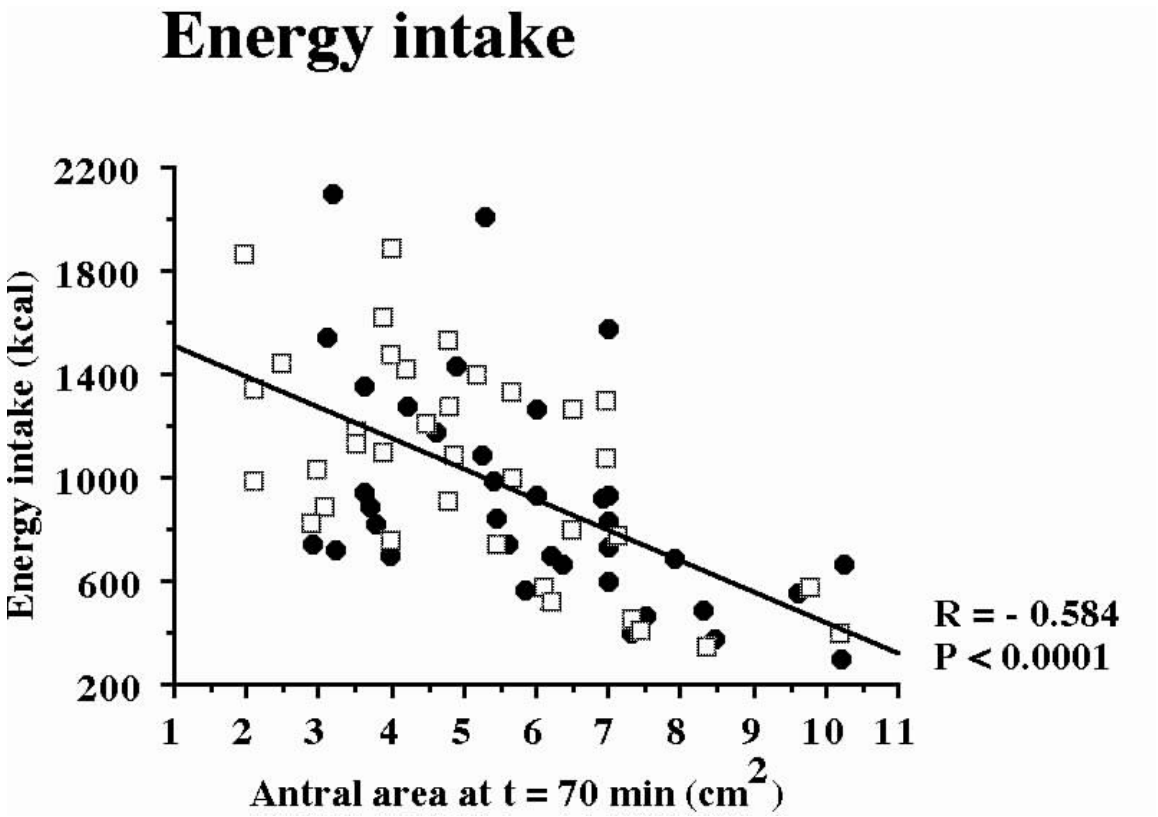
Sensory Stimulation



Relation between voluntary food intake and size of gastric antrum

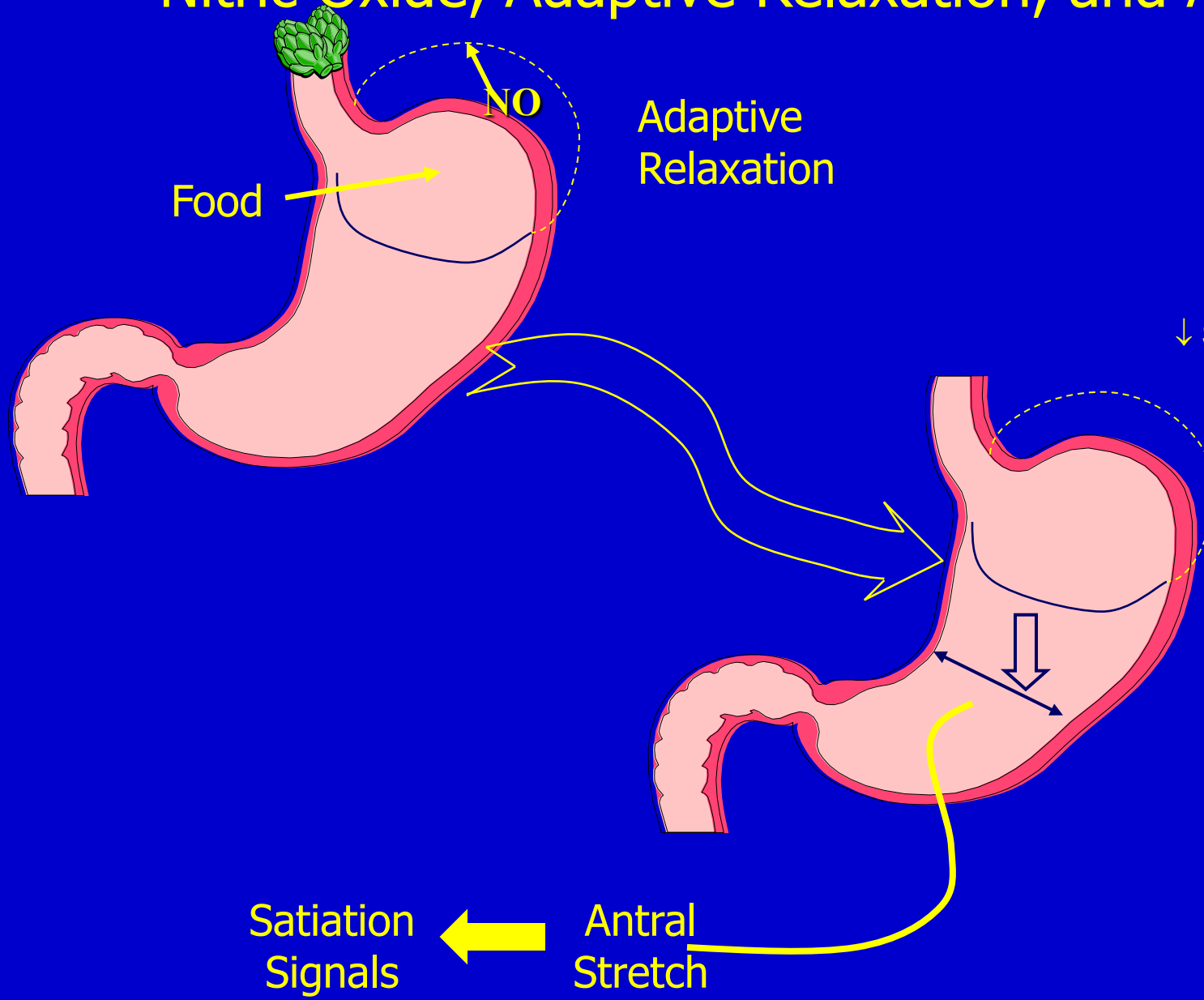
Sturm K et al Am J Clin Nutr. 2004 80:656

antral area larger in older subjects



young ● older

Nitric Oxide, Adaptive Relaxation, and Appetite



EFFECTS OF AGING

↓ Nitric Oxide

↓ Smooth Muscle Relaxation

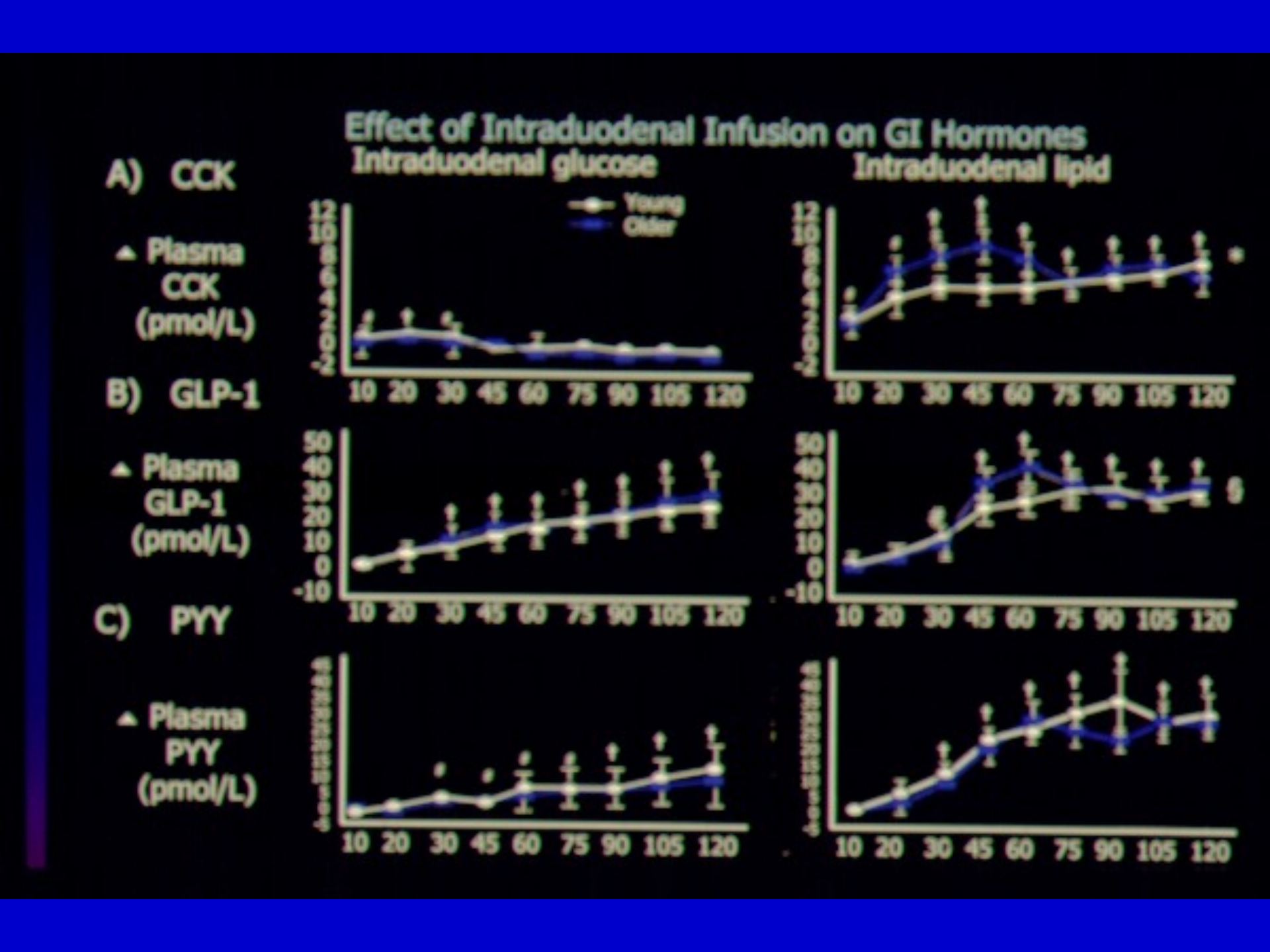
↓ Fundal Compliance

↓ Adaptive Relaxation

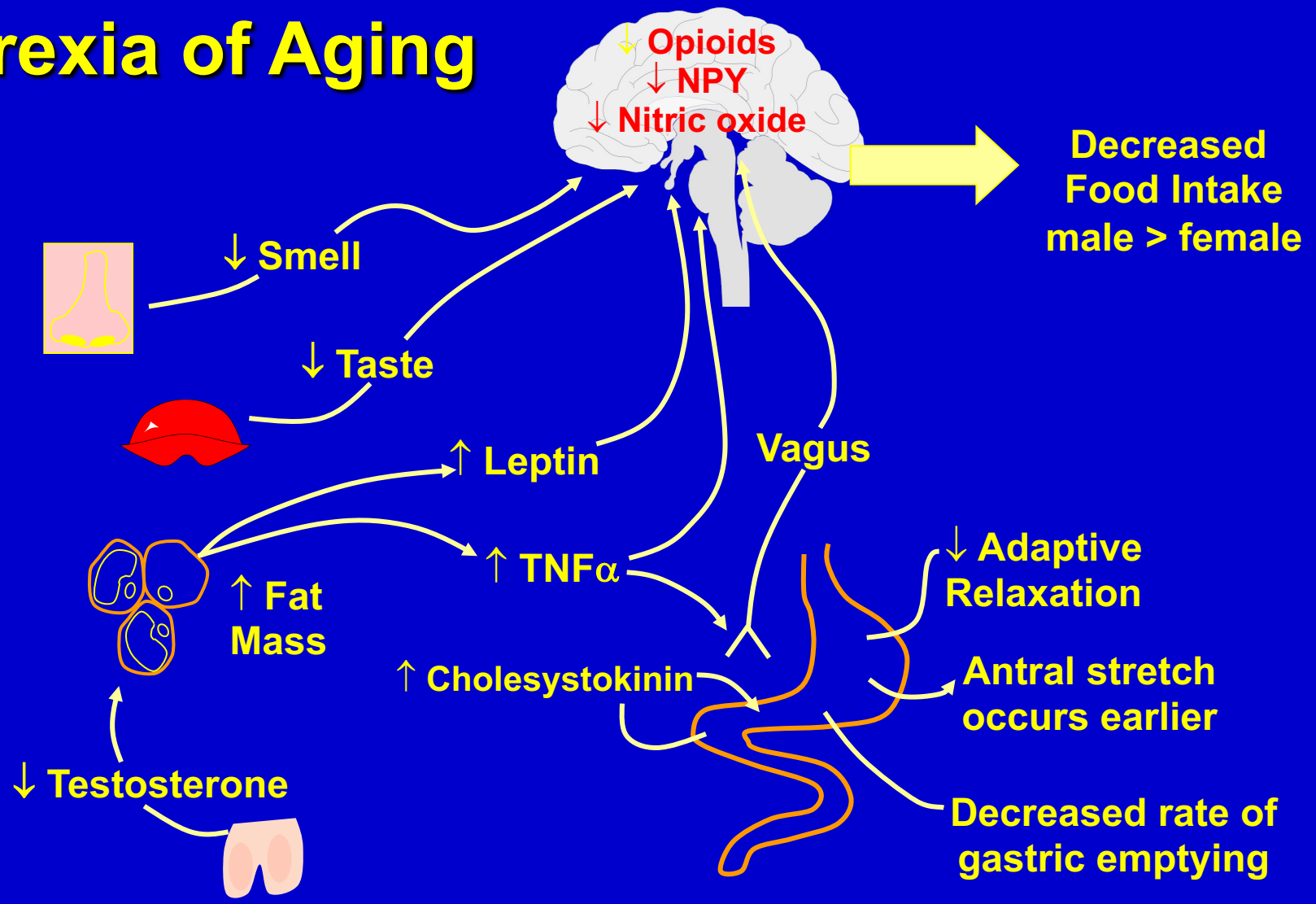
↑ Rate of Antral Filling

↑ Antral Stretch

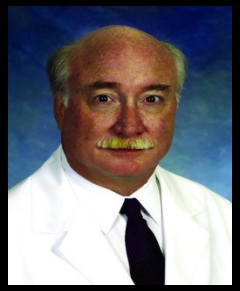
Early Satiation


Effect of Intraduodenal Infusion on GI Hormones
Intraduodenal glucose
Intraduodenal lipid
A) CCK
Plasma CCK (pmol/L)
B) GLP-1
Plasma GLP-1 (pmol/L)
C) PYY
Plasma PYY (pmol/L)
Young
Older
10 20 30 45 60 75 90 105 120

Anorexia of Aging



Morley JE, et al.. Pharm, Biochem Behavior. 50(3):369-73, 1995



S.N.A.Q

1) My appetite is

1. Very poor
2. Poor
3. Average
4. Good
5. Very good

2) When I eat, I feel full after

1. Eating only a few mouthfuls
2. Eating about a third of a plateful
3. Eating over half a plateful
4. Eating most of the food
5. Hardly ever

3) Food tastes

1. Very bad
2. Bad
3. Average
4. Good
5. Very good

4) Normally I eat

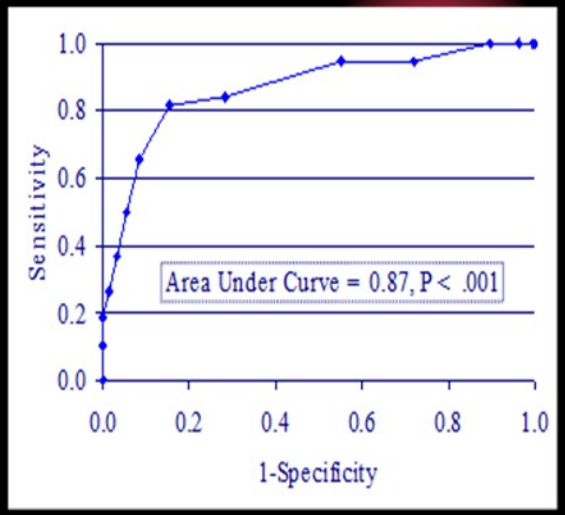
1. Less than one full meal a day
2. One meal a day
3. Two meals a day
4. Three meals a day
5. More than three meals a day, including snacks

< 15 predicts significant weight loss within 6 months

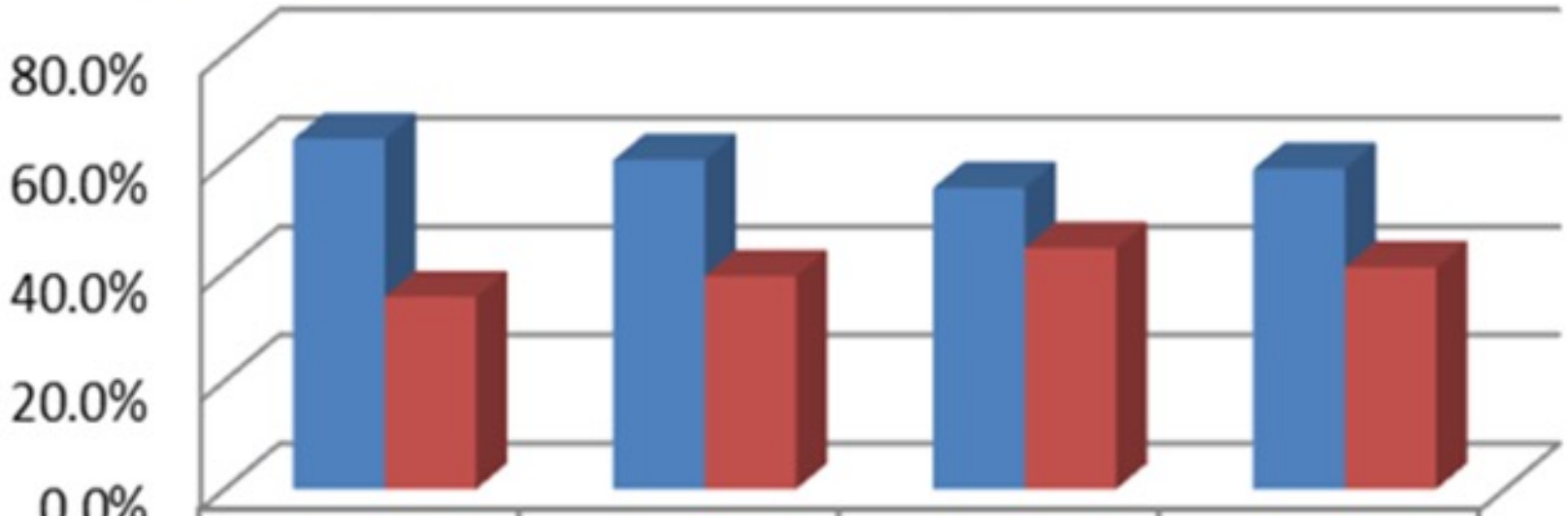
2005

SNAQ

	Sensitivity (%)	Specificity (%)
5% weight loss	81.3	76.4
10% weight loss	88.2	83.5

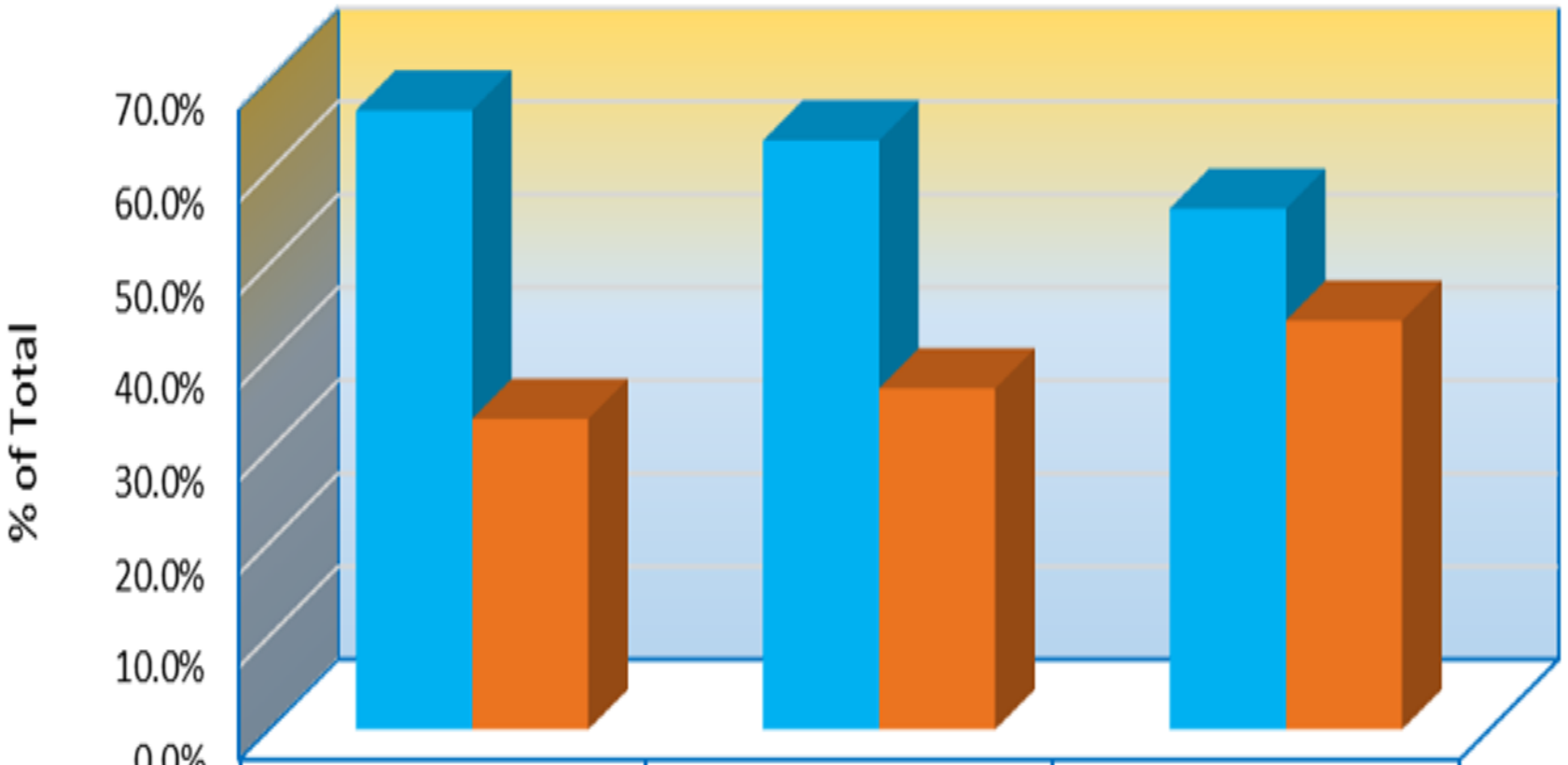


SNAQ Results
7/1/2015 - 6/30/2017



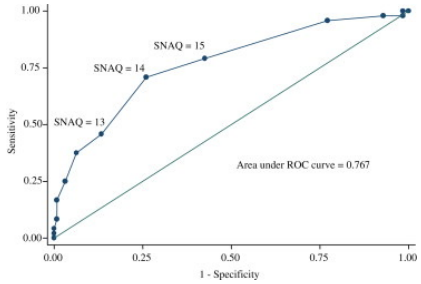
	Physician /Case Finding	Screening/ Non-Physician	Nursing Home	PACE
No	64.6%	60.7%	55.6%	59.1%
Yes	35.4%	39.3%	44.4%	40.9%

SNAQ Results by Age Group



	65-74	75-84	85+
Not At Risk	66.6%	63.3%	56.0%
At Risk	33.4%	36.7%	44.0%

Screening Older People at Risk of Malnutrition or Malnourished Using the Simplified Nutritional Appetite Questionnaire (SNAQ): A Comparison With the Mini-Nutritional Assessment (MNA) Tool



Malnutrition and poor appetite were prevalent among the geriatric outpatients and inpatients.
SNAQ was more reliable and valid as an appetite screening tool among this special group of population

J Nutr Health Aging. 2012 Jul;16(7):660-5.

Validation of screening tools to assess appetite among geriatric patients.

Hanisah R1, Suzana S, Lee FS.

A low SNAQ score was associated with an increased risk of hospital acquired infection (OR 3.53; 95% CI: 1.48, 8.41; p=0.004) and with risk of death (HR 2.29; 95% CI: 1.12, 4.68; p = 0.023) by follow-up

Measuring Appetite with the Simplified Nutritional Appetite Questionnaire Identifies Hospitalised Older People at Risk of Worse Health Outcomes

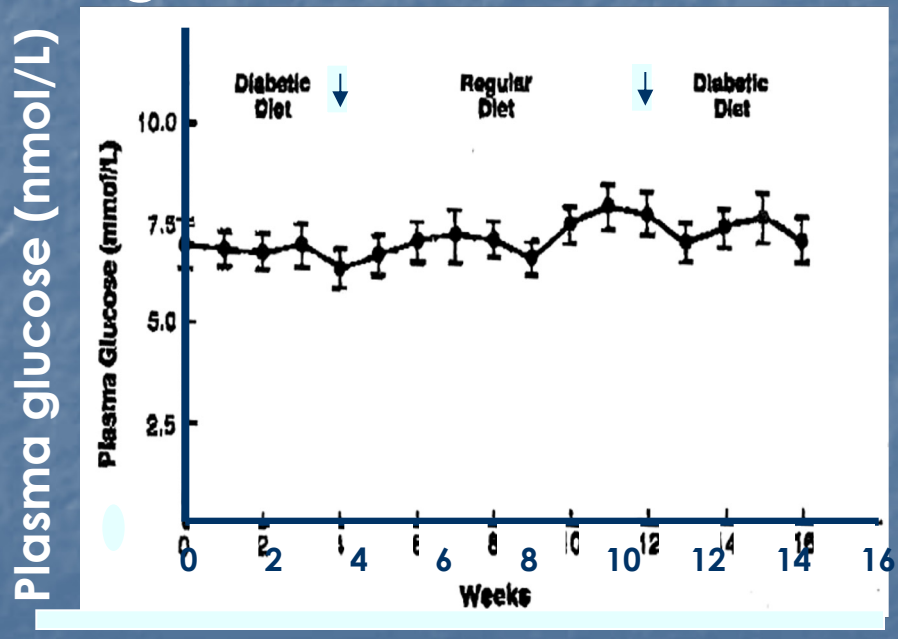
A.L. PILGRIM,[1,2] D. BAYLIS,[1] K.A. JAMESON,[2] C. COOPER,[2] A.A. SAYER,[1,2,3,4] S.M. ROBINSON,[1,2] and H.C. ROBERTS[1,2,3,4]

"We have to lament that our mode of cure is so contrary to the inclinations of the sick. Though perfectly aware of the efficacy of the [diet] regimen, and the impropriety of deviations, yet they commonly trespass, concealing what they feel as a transgression on themselves. They express a regret that a medicine could not be discovered however nauseous or distasteful, which would suppress the necessity of any restriction of diet."

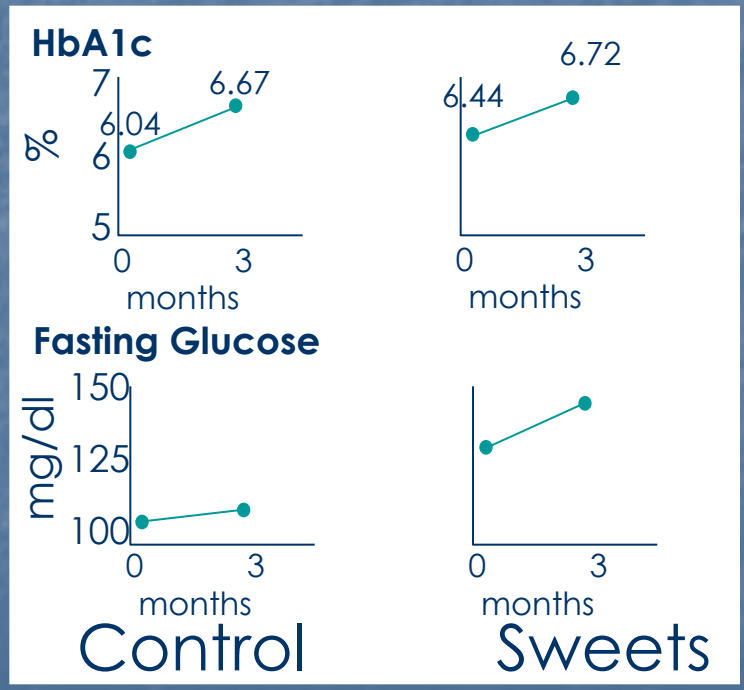
-John Rollo, 1798

Diet for NIDDM Home Residents

Regular Diet



Concentrated Sweets



Coulston et al, Am J Clin Nutr 57:87, 1990

Causes of Weight Loss in Nursing Home Residents

Morley & Kraenzle JAGS 1994:42:6

	Short stay <6 months	Long stay >6 months	Total %
Depression	60	36	36
Swallowing disorder		8	7
Cancer		8	7
Wandering	20	4	9
Medications	20	4	7
Psychotropic drugs	20	4	7
Tardive dyskinesia		4	3
COPD		4	7
Dehydration	20	4	7
Dementia		4	3
Obsessive Compulsive		4	3
Paranoia		4	3
Gallstones		4	3
Unknown	0	4	3

Common Causes of Undernutrition in Medical Outpatients

	Older (%)	Young (%)
Depression	30	15
Cancer	9	2
Therapeutic diet	7	12
Oropharyngeal disease	7	5
Intentional	2	20
Chronic pain	2	10
Misc	43	36

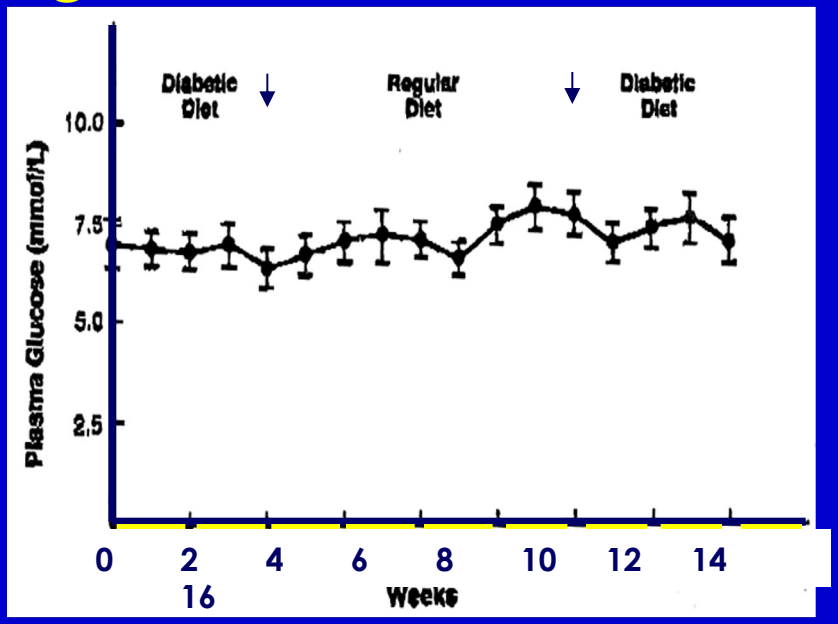
Wilson MMG Am J Med. 1998;104:56

Dietician Von Eiffel controls the Wuff-Whiffer,
our Diet-Devising Computerized Sniffer,
On which you just simply lie down in repose
And sniff at good food as it goes past your nose.
From caviar soufflé to caribou roast,
From pemmican patties to terrapin toast,
He'll find out by Sniff-Scan the foods you like most.

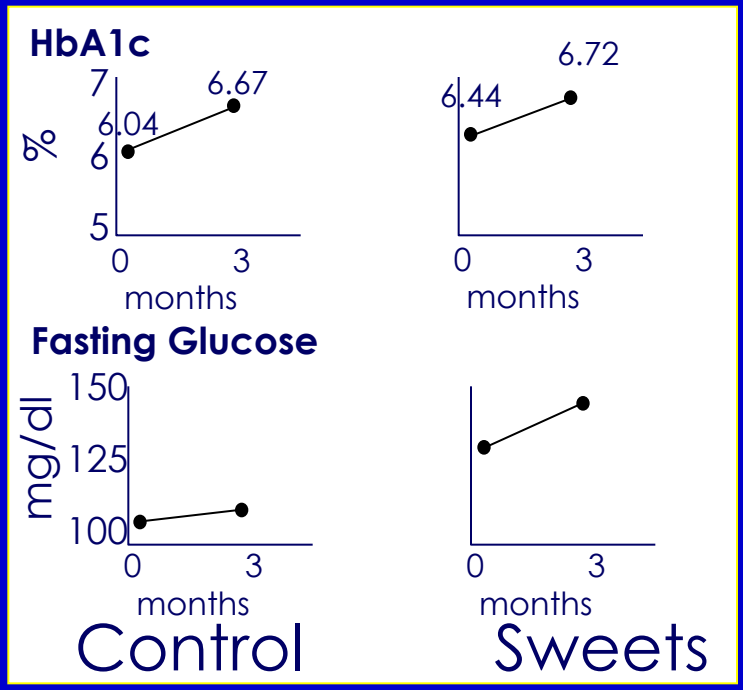
And when that guy finds out
What you like,
You can bet it
Won't be on your diet
From here on, forget it!

Diet for NIDDM Home Residents

Regular Diet

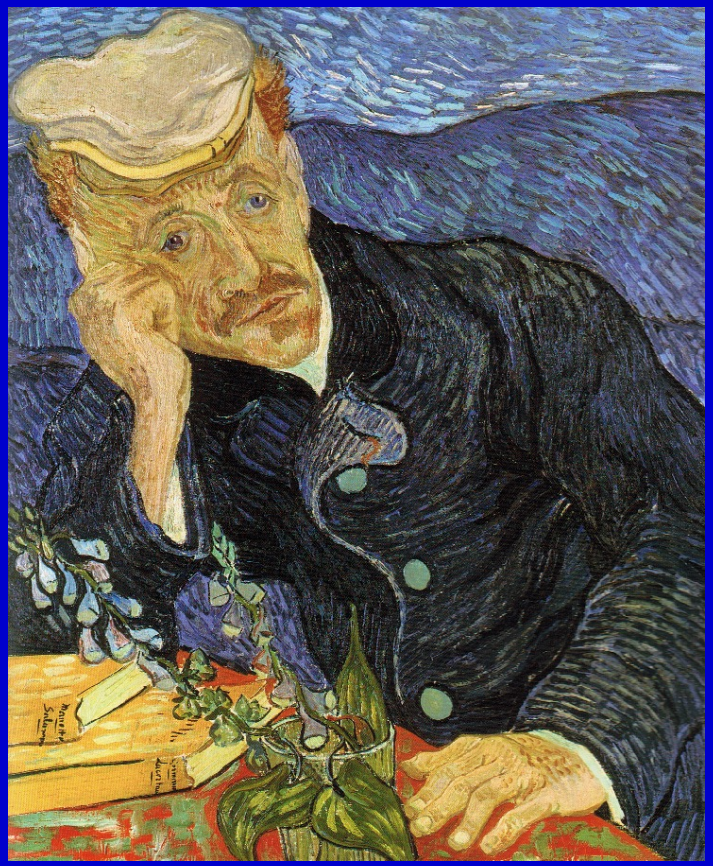


Concentrated Sweets



Coulston et al, Am J Clin Nutr 57:87, 1990

Vincent Van Gogh



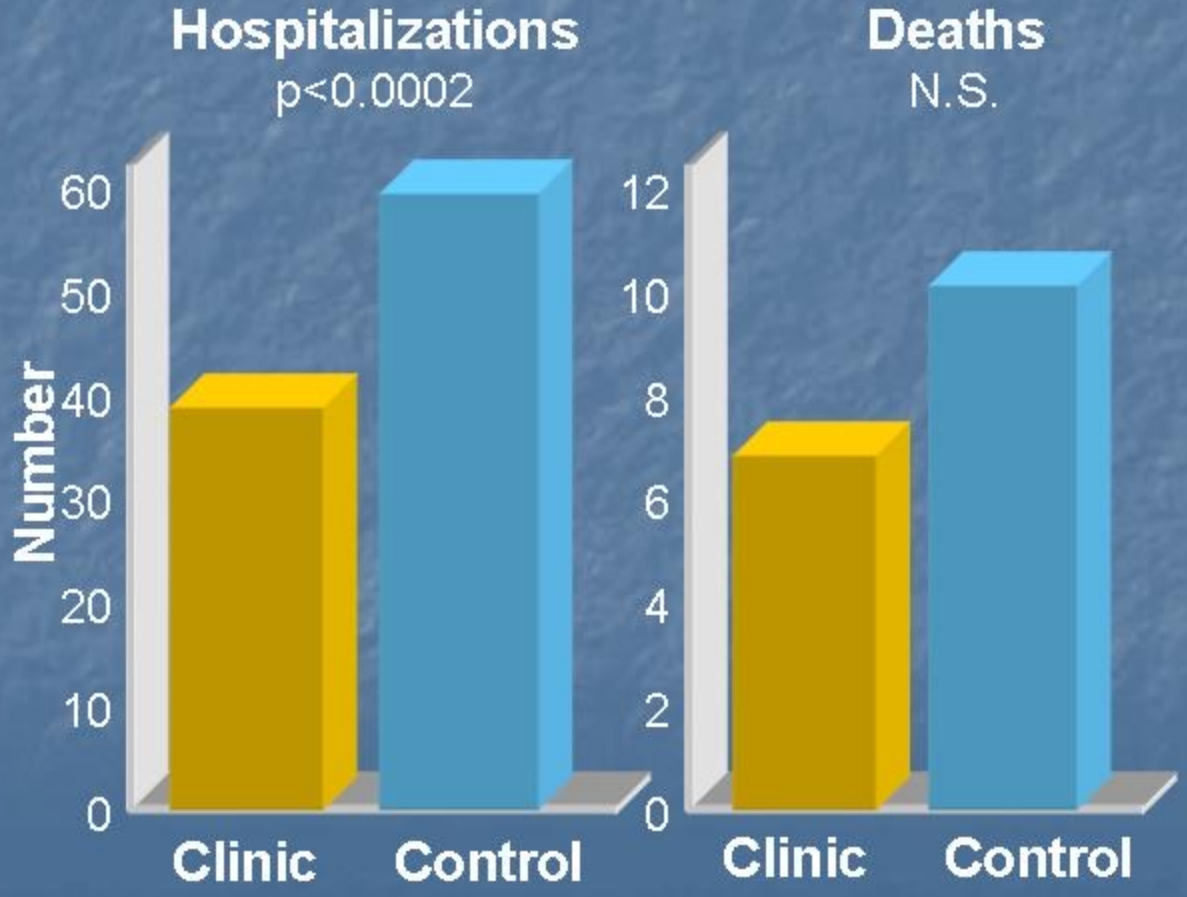
Dr. Gachet

Starry Night

The Polypharmacy Conundrum

Effect of Medication Reduction

Meds reduced from 13.1 to 8.2



Drugs Contributing to Anorexia

- Antidepressants
- Uricosurics
- CNS Stimulants
- Xanthines
- Dopamine Agonists
- Sympathomimetics
- Antiarrhythmics
- Diuretics-Antihypertensives
- NSAID'S & Steroids
- Opiates
- Acetylcholinesterase inhibitors
- Antibiotics & Antibacterials
- Antineoplastics
- Antidiabetics
- Anticoagulants
- Antiepileptics

Some Specific Feeding Problems in Alzheimer Disease

- Apraxia of feeding
- Wandering
- Psychtropic withdrawal
- Dysphagia

Causes of Weight Loss

Medications
Emotional (depression)
Alcoholism,anorexia tardive, abuse (elder)
Late life paranoia
Swallowing problems

Oral problems
Nosocomial infections,no money (poverty)

Wandering/dementia
Hyperthyroidism,hypercalcemia,hypoadrenalism
Enteric problems (malabsorption)
Eating problems (eg. Tremor)
Low salt, low cholesterol diet
Shopping and meal preparation problems, Stones (cholecystitis)

Morley JE, Silver AJ. Ann Intern Med 1995;123:850-859.

PROTEIN AND ENERGY SUPPLEMENTATION IN ELDERLY MALNOURISHED

- Cochrane Database,2002
- 31 trials, n=2464
- Supplementation produced weight gain
- Mortality decreased RR 0.67(0.52-0.87)
- Length of hospitalization declined by 3.4 days
- Inadequate numbers to judge effect on function

Sociological Intervention for Nutritional Problems in Inner-City Elderly

	Control	Study	P
MNA	-0.42	1.25	0.05
GDS	1.72	-0.41	0.03
MMSE	-0.67	0.58	0.14

Suda, Masske, Flaherty, Morley Journal Nutrition, Health & Aging. 5(2):118-23, 2001.

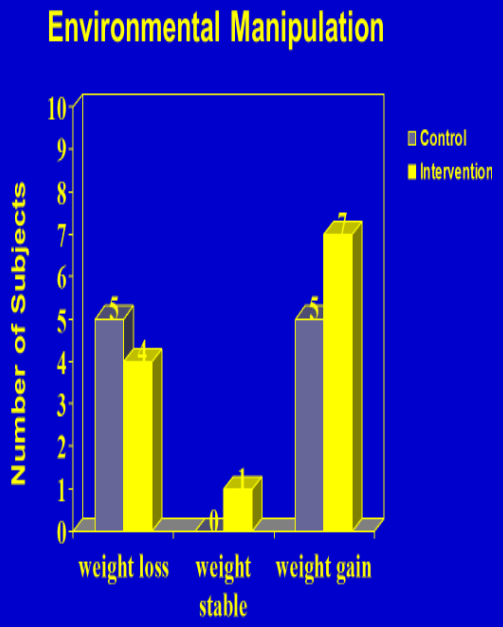
Caregiver burden is associated with weight loss

Brocker et al,Rev de Medecine Interne 24:314S,2003

Reviere et al,Int J Ger Psych 17:950,2002

Environmental Considerations

- Surroundings quiet & calm, comfortable
- Positive dining room atmosphere
- Well lighted
- Caregivers are friendly and polite
- Staff directs conversation to resident at meal time
- Dining room service not rushed



Dietician Von Eiffel controls the Wuff-Whiffer,
our Diet-Devising Computerized Sniffer,
On which you just simply lie down in repose
And sniff at good food as it goes past your nose.
From caviar soufflé to caribou roast,
From pemmican patties to terrapin toast,
He'll find out by Sniff-Scan the foods you like most.

And when that guy finds out
What you like,
You can bet it
Won't be on your diet
From here on, forget it!

Food Presentation

Buffet Dining

Snack Cart

Finger Foods

A great way to improve intake at mid-meals, and to incorporate appropriate feeding methods

All to be eaten with their hands

Best at room temperature

Pureed and extremely thick

Soaking Foods

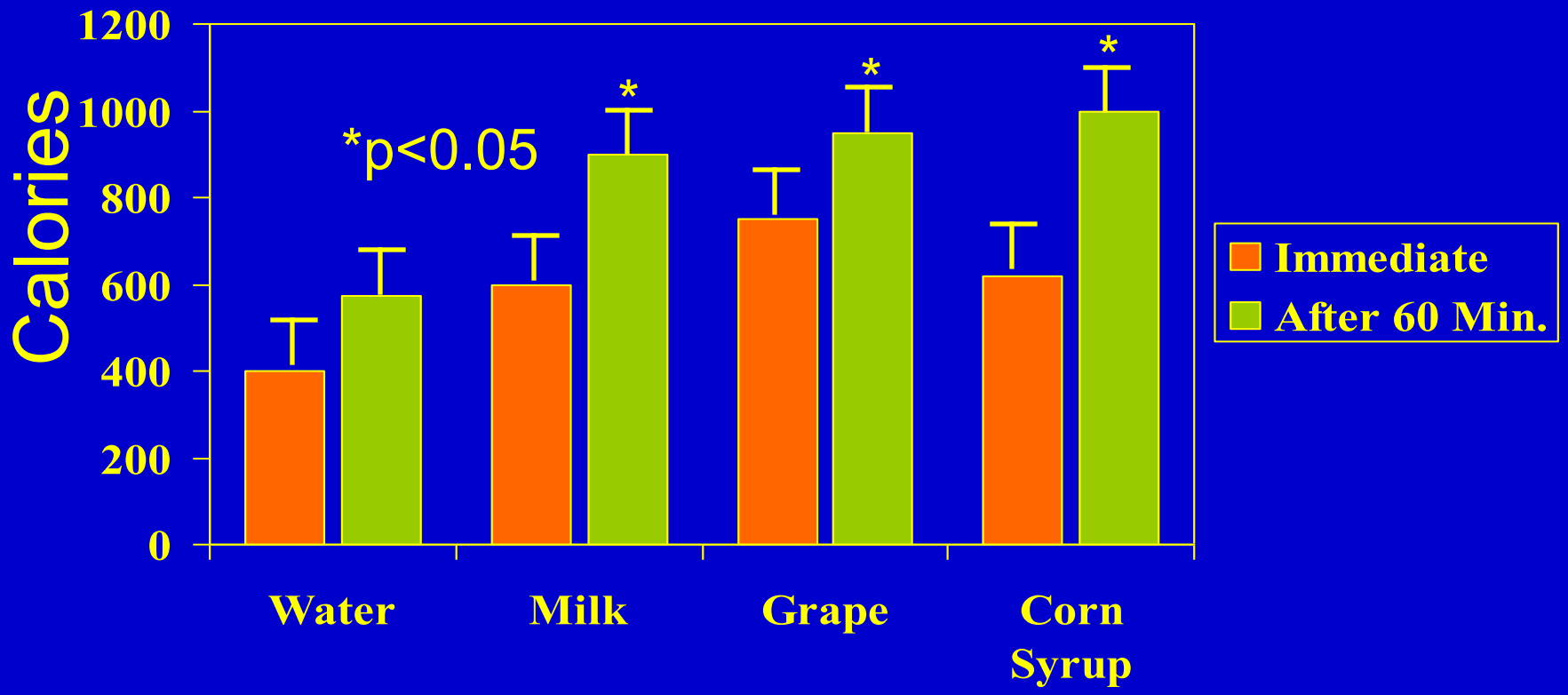
Allows “normal” looking foods

All to be eaten with their hands

Great for a high-tea

Minced diet

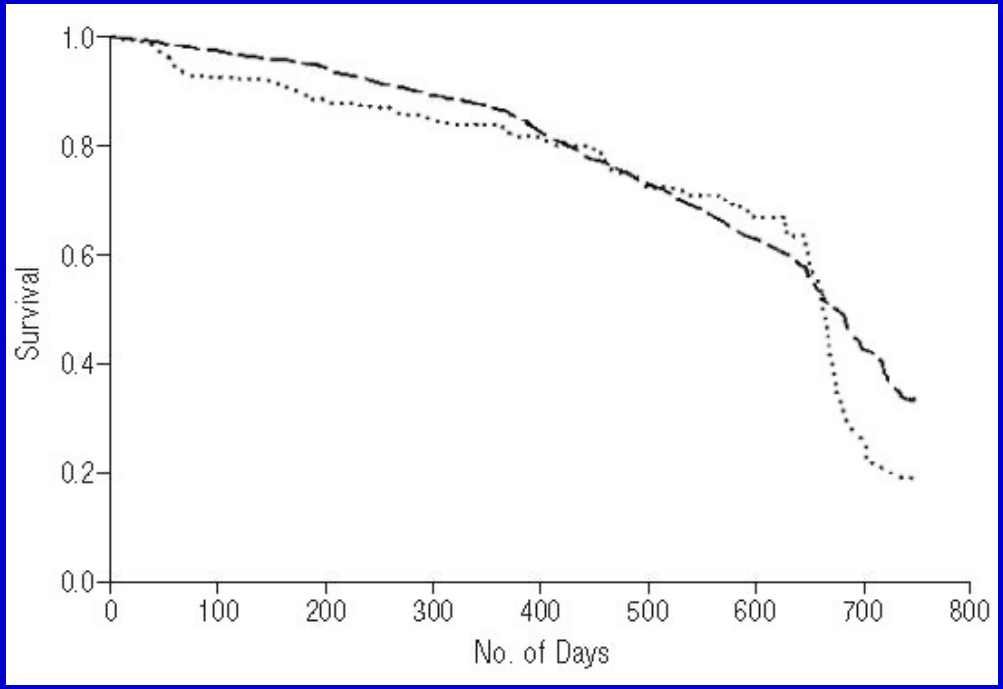
Effect of Time of Administration of Oral Caloric Supplements



Wilson MM, et al.. Amer J Clinical Nutrition. 75(5):944-7, 2002

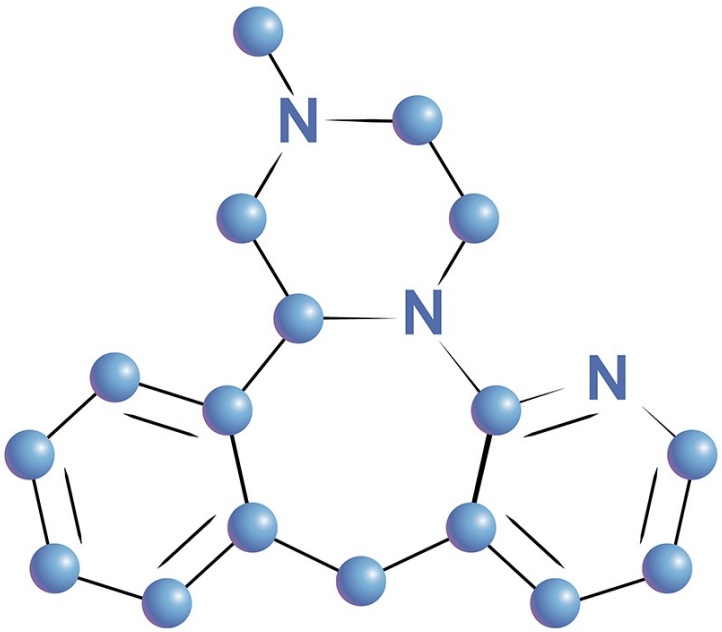
The risk factors and impact on survival of feeding tube placement in nursing home residents with severe cognitive impairment

Feeding tube placement was not associated with survival (RR, 0.90; 95% CI, 0.67-1.21), even when adjusted for age <87 years, aspiration, chewing or swallowing problems, stroke, functional impairment, no dementia, pressure ulcers, and DNR status.



Mitchell SL et al. Arch Intern Med 1997;157:327-32.

How do we improve appetite?



Mirtazapine

"MEALS ON WHEELS"

Emotional problems

(Depression)

Depression

---most common reversible cause of weight loss

- Outpatients:--up to 30%
- NH pts ----------36%

Treatment of depression gives weight gain

Antidepressants with appetite stimulation

Mirtazapine (Remeron)
intial dose:7.5 mg q hs
Max. dose:30 mg q hs

Trazadone
intial dose:25 mg q hs
Max. dose: 100 mg q hs

Dronabinol

- Appetite stimulant
- Antinausea
- Decreases pain
- Enhances general well being

May be useful for palliation at end of life

Dronabinol

Anorexia and Disturbed Behavior in Patients with Alzheimer Disease

(n = 11)
Age 65 to 82 years

Body Weight Increase (lbs)

Placebo	6.3
Dronabinol	9.3

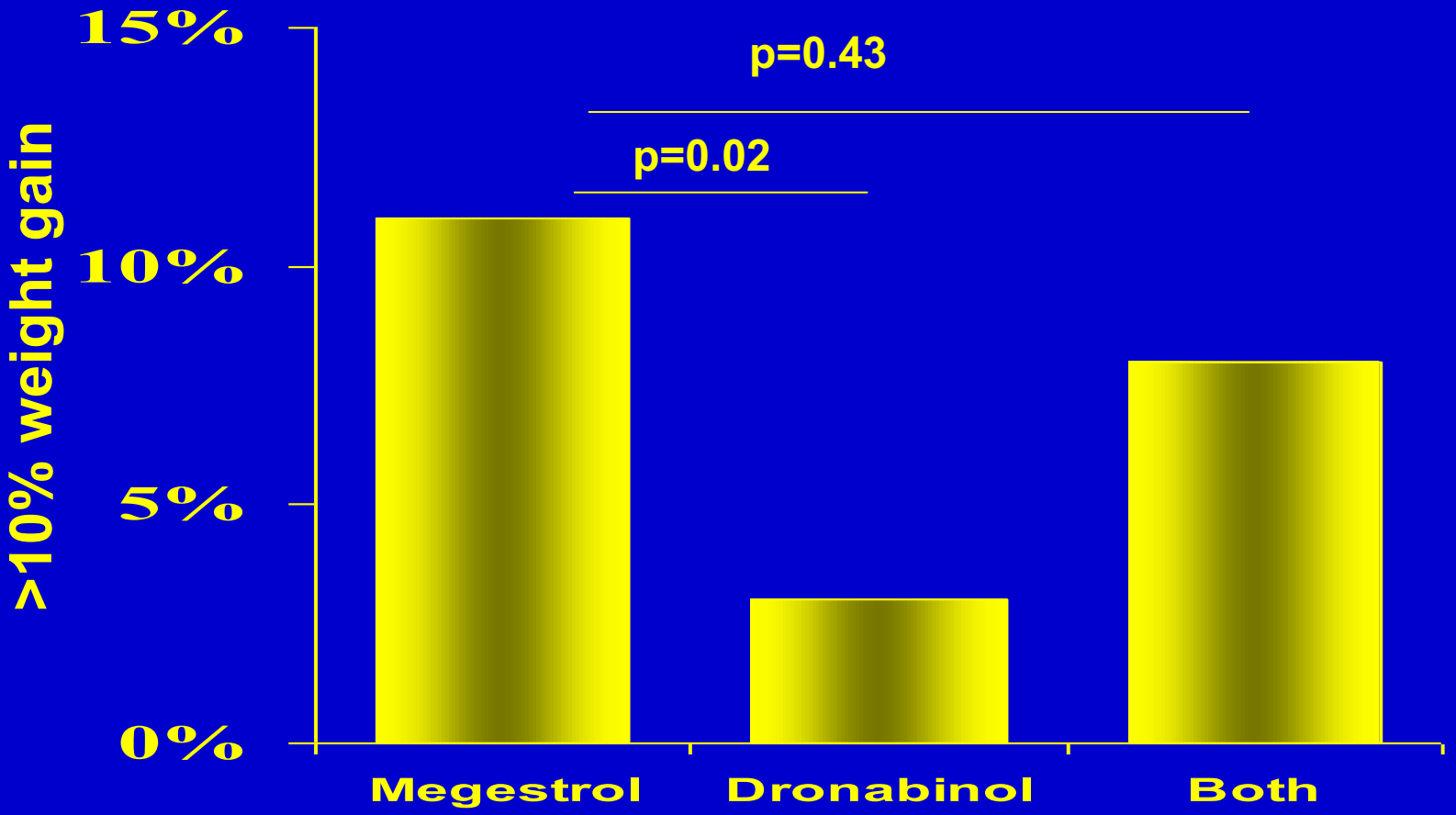
Dronabinol improved scores on the Cohen Mansfield Agitation Index

Volicer et al, Int J Genat Psychiat 12:913, 1997

DRONABINOL
Dosing in Elderly

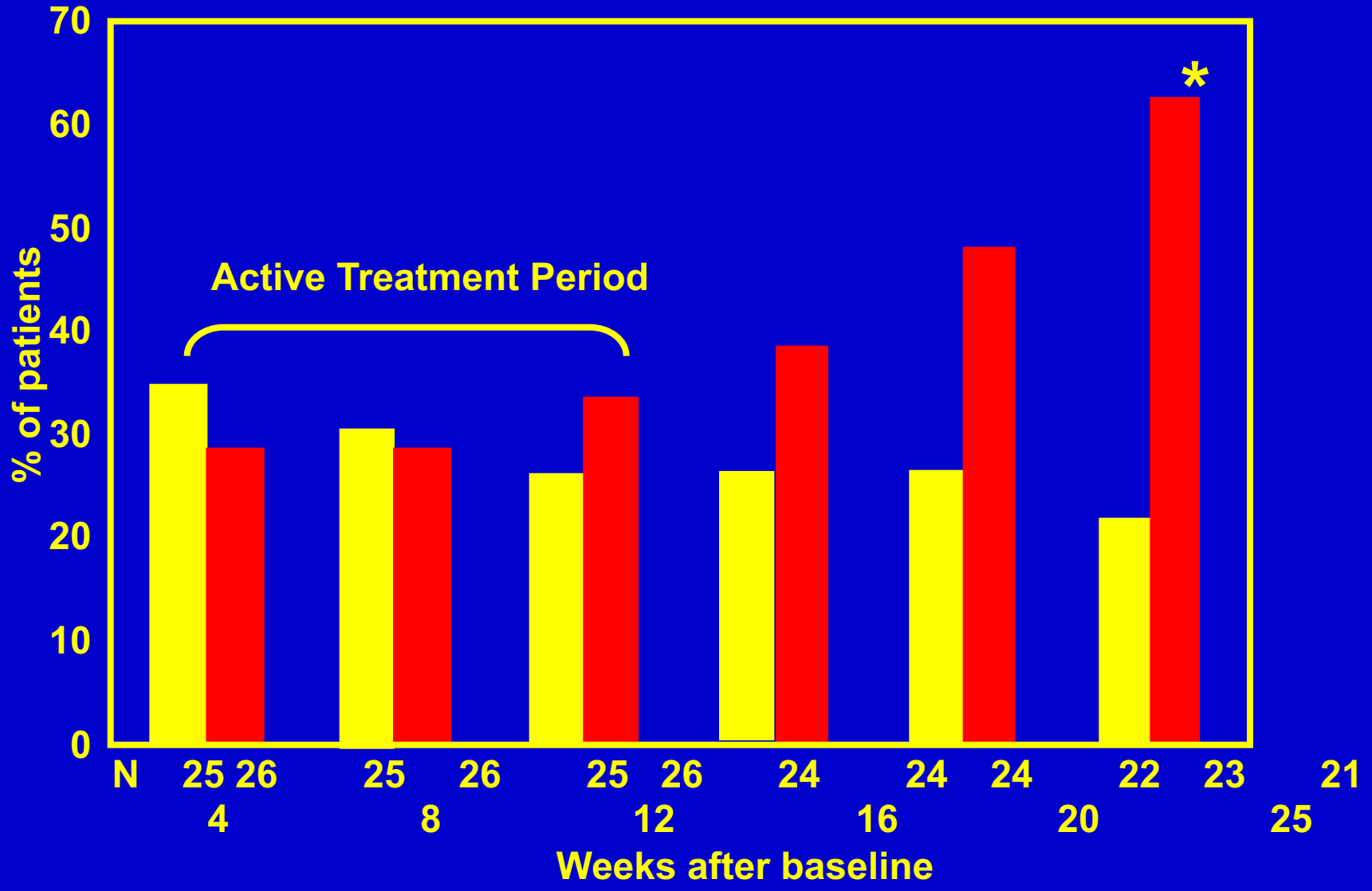
- Start with 2.5 mg prior to bedtime
- After one week move to 2.5mg before supper
- After 2 weeks if no response 2.5mg before supper and lunch

Dronabinol Versus Megestrol Acetate Versus Combination Therapy for Cancer-Associated Anorexia



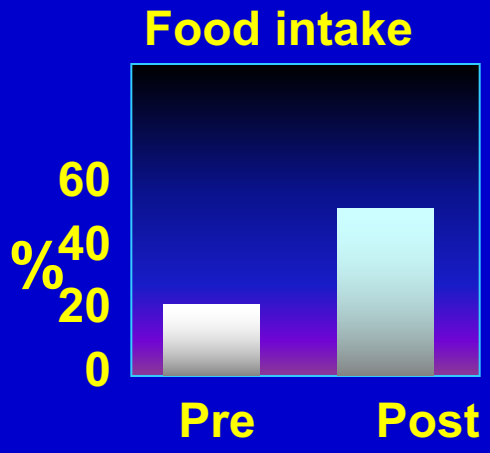
Jatoi Journal of Clinical Oncology 2002;20:567

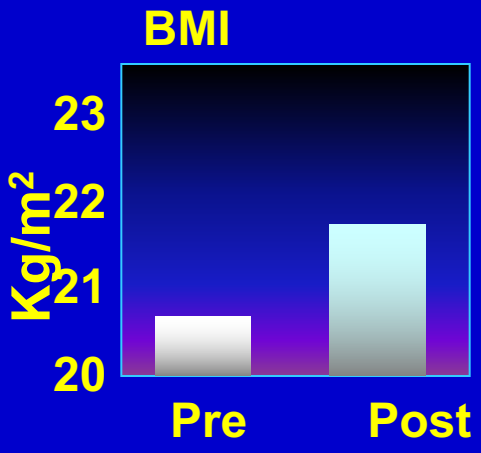
Megestrol Acetate in Geriatric Wasting

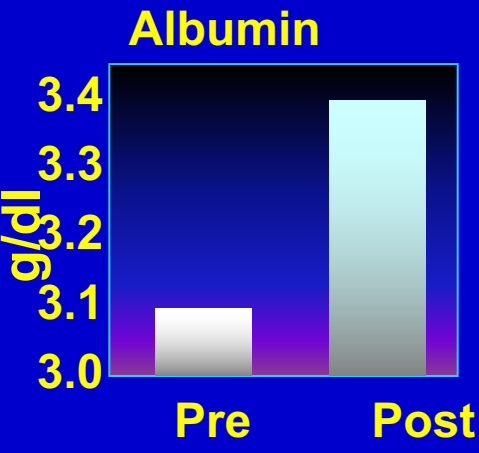


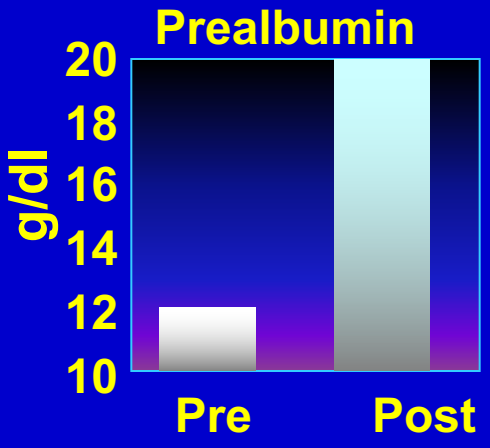
Yeh et al JAGS 48:485, 2000

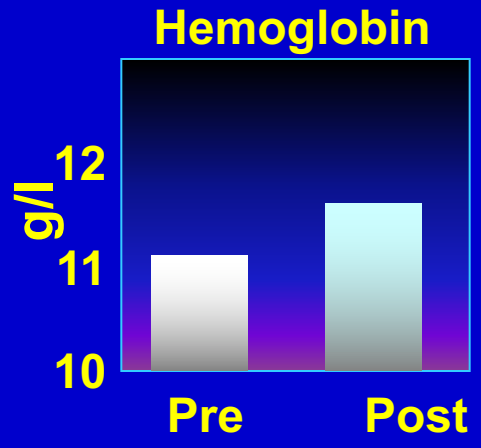
Megestrol Acetate in Nursing Homes

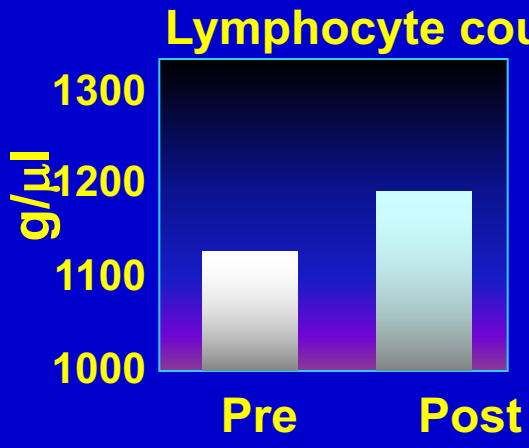






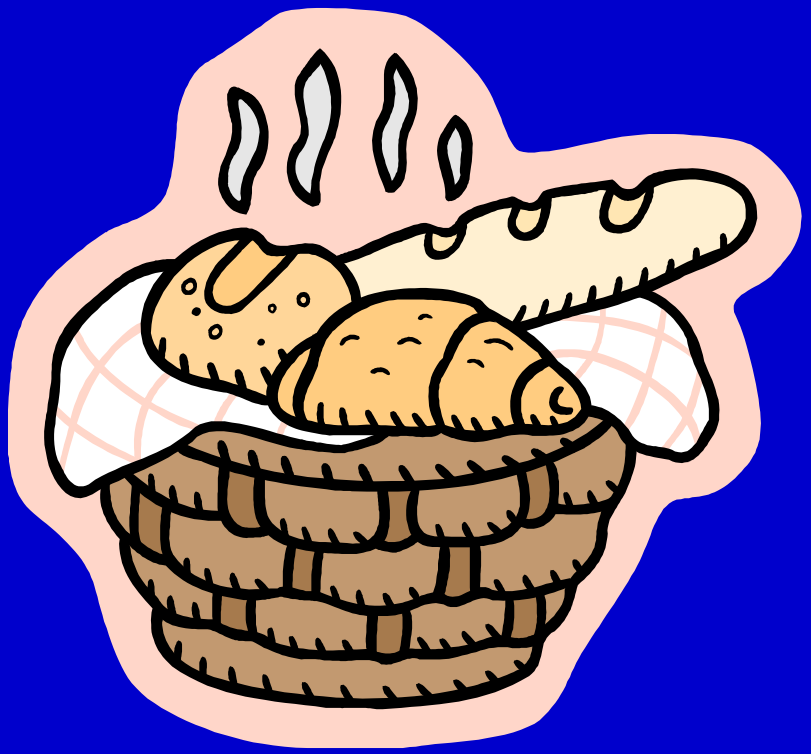






Karcic E, Philpot C, Morley JE. Journal of Nutrition Aging 2002;6:1191

MEGESTROL DOSING



- MEGACE SUSPENSION
- 800mg PO QD

- Avoid in high risk for DVT

Levels of Evidence for Orexigenic Drugs

Level A

There exist a high-standard meta-analysis or several high-standard randomized clinical trials that give results

MEGESTROL ACETATE

Level B

There exist good quality evidence from randomized trials (B1) or prospective studies (B2); the results are consistent when considered together

CORTICOSTERIODS

Level C

The methodology of the available studies is weak or their results are not consistent when considered together

DRONABINOL, ANABOLIC STERIOD

Level D

Either the scientific data do not exist or there is only a series of cases

MIRTAZAPINE

Expert agreement

The data do not exist for the method concerned, but the experts are unanimous in their judgment

Based on French National Federation of Cancer Centers Working Groups and one subsequent meta-analysis
(J Pain Symp Manage 27:360, 2004)

Anorexia of Aging
Geriatric anorexia

Anorexia of aging leads to:

- Sarcopenia
- Frailty
- Disability
- Institutionalisation
- Mortality

Anorexia of aging is:

- Common
- Treatable