"After the seventy all is troublesome and worry"

Richard Barton, The anatomy of melancholia, 1621

Anti-Ageing medicine

- A health care model for early detection, prevention, treatment and reversal of age-related dysfunction in order to prolong healthy life span

- To achieve these goals new technologies should be used (examples):
    - Stem cell therapies
    - Gene therapies (repair of RNA and DNA)
    - Immune restoration therapies (stimulation of Thymus)
    - Hyperbaric oxygen therapy
    - Chelation therapies (removing heavy metals)
    - Hormone replacement therapies
    - Dietary supplementation ("drugs"?)
    - Detoxifications
    - Sports and rehabilitation

Klatz R. Ann NY Acad Sci 2005; 1057: 536-44.

Challenges and problems

- **Do elderly people want this development? Or are people happy as is it?**
- **Which are the goals we should go for? (paradigm)**
  - **How far should we go?**
- **The "good" and the "bad" genes**
  - **Would it be possible to achieve the same results in all**
- **Does it work (do we have any evidence)?**
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Anti-Ageing Medicine = Biogerontology

But what about old peoples' self perception of ageing?

First question
Self perception as successful agers (Vahia et al, 2010)
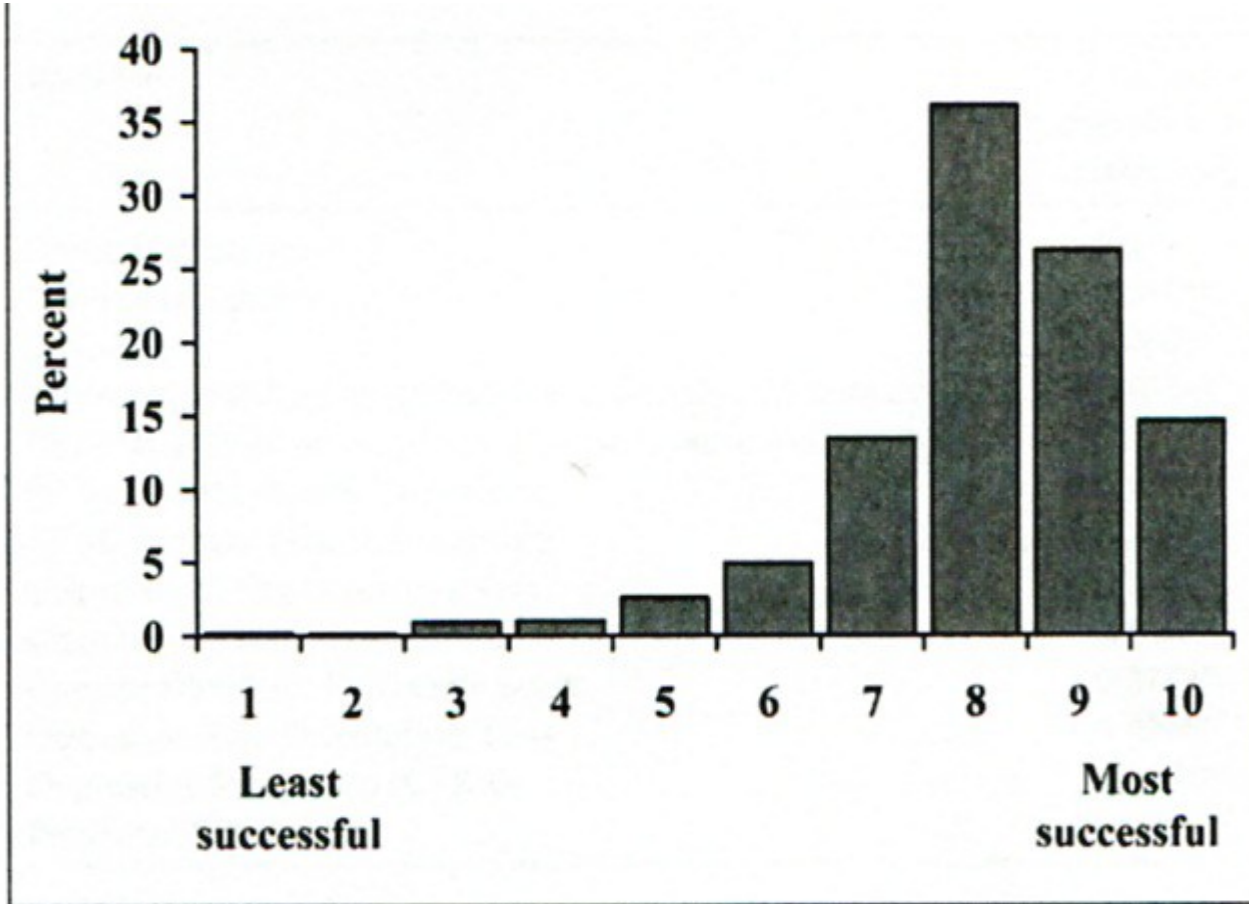

Figure 1 Distribution of self-rated successful aging in older women (n=1,979)

Prevalence of factors related to the biomedical definition of successful ageing in the same women

- **Absence of disease**   **15%**
- **Freedom of disabilities**   **38%**
- **Normal cognition**   **71%**

- **Active engagement in life**   **74%**
- **Mastery/growth**   **81%**
- **Positive adaptation**   **81%**
- **Life satisfaction**   **84%**

Studies on self perception of good healthy in the old

➢ **Montross et al, 2006 found that 92% of 205 community dwelling old people rated themselves as successful ager, even though the majority did not meet the Rowe and Kahn's definition**

➢ **Bowling and Dieppe, 2005 in a BMJ paper found that old people rated social integration and well-being more important for successful ageing than biomedical factors**

➢ **Eisenman, 2006 reported that most old people (in a study of 239 former Yale students) found their QoL to be good despite the presence of diseases and disabilities.**

A kind of "resilience" to age-related diseases seems to play a role

Second question
The goals of 3 different Anti-Ageing medicine paradigms

Compression of morbidity:

 The life-span is fixed, but the time of infirmity is shortened   **Fries JF. NEJM 1980;303:130-6.**

Decelerated ageing:

The ageing processes are slowed down so that both the average life expectancy and the maximum life expectancy (maybe 140 years) are increased

de Grey et al. BioEssay 2002; 24:667-76.

Arrested ageing:

The ageing processes are reversed and vitality is restored and life expectancy will be very much increased (immortality?; 1000 years???)

de Grey ADNJ . Biogerontology 2002;1:369

Third question
Longevity, health and genetics

➢ **The maximum life expectancy is today about 120 -130 years, and has increased just a little during the last 1000 years. But it may increase faster in the years to come!**

➢ **Genetic factors are important for the maximum life expectancy in a person, maybe as much as 30-50%.**

Centenarians

Results from a study of 602 centenarians in Italy

(Motta et al, Archives of gerontology and geriatrics 2005; 40: 241-51)

- **Good: medium: poor health status   20% : 33.4% : 46.6%**
- **Only 5.7% were totally independent in ADL**
- **13.4% had cognitive disorders**
- **35.2% had hypertension**
- **But only 0.9% had Parkinson's disease; 4.9% had diabetes and 6.4% had thyreopathies**
- **Little social engagement**

Fourth question

Do we have any evidence for the effects of the Anti-Ageing treatments/preventions?

Determinants for the various biomedical definitions of successful ageing

- Physical exercise
- No smoking
- No obesity
- No diabetes and arthritis

  - Absence of depression
  - Many social contacts
  - Positive view of ageing

Peel et al, AmJ Prev Med 2005; 28(3): 298-304 and Depp and Jeste. AJGP 2006; 14: 6-20)

Lupien AJ and Wan N. Phil Trans R Soc Lond B 2004; 359:1413-26

Interventions

Good evidence

- ➤ **Physical exercise**
- ➤ **Caloric restriction (at least in animals, but no knowledge in man)?**
  - – Mortality is highest in those with a very high and low BMI

Interventions that could enhance successful ageing

- ➤ **Optimal prevention and treatment for cardiovascular disorders and diabetes**

Physical exercise and dependency

|	In-home nursing		NH admittance	
	beta	p value	beta	p-value
Number of activities	-0.77	0.000	-0.65	0000
Number Weekly $\geq$ 20 minutes	-0.89	0.013	-0.94	0.022
Walking $\geq$ 20 min	-0.95	0.033	-0.93	0.046
Gardening $\geq$ 20 min	-0.99	0.71	-0.93	0.299
	(linear regression)			

Jedrziewski et al, Alzheimer and Dementia 2010

Physical exercise in elderly persons with memory problems (SCI/MCI,(n=170)

Physical exercise= fast walking for 24 weeks

	Intervention	Control
ADAS-COG (24 weeks)	+ 0,26	- 1,04

Caloric restriction, obesity and death in 100 000 American women

Andrus Viidik, 2004
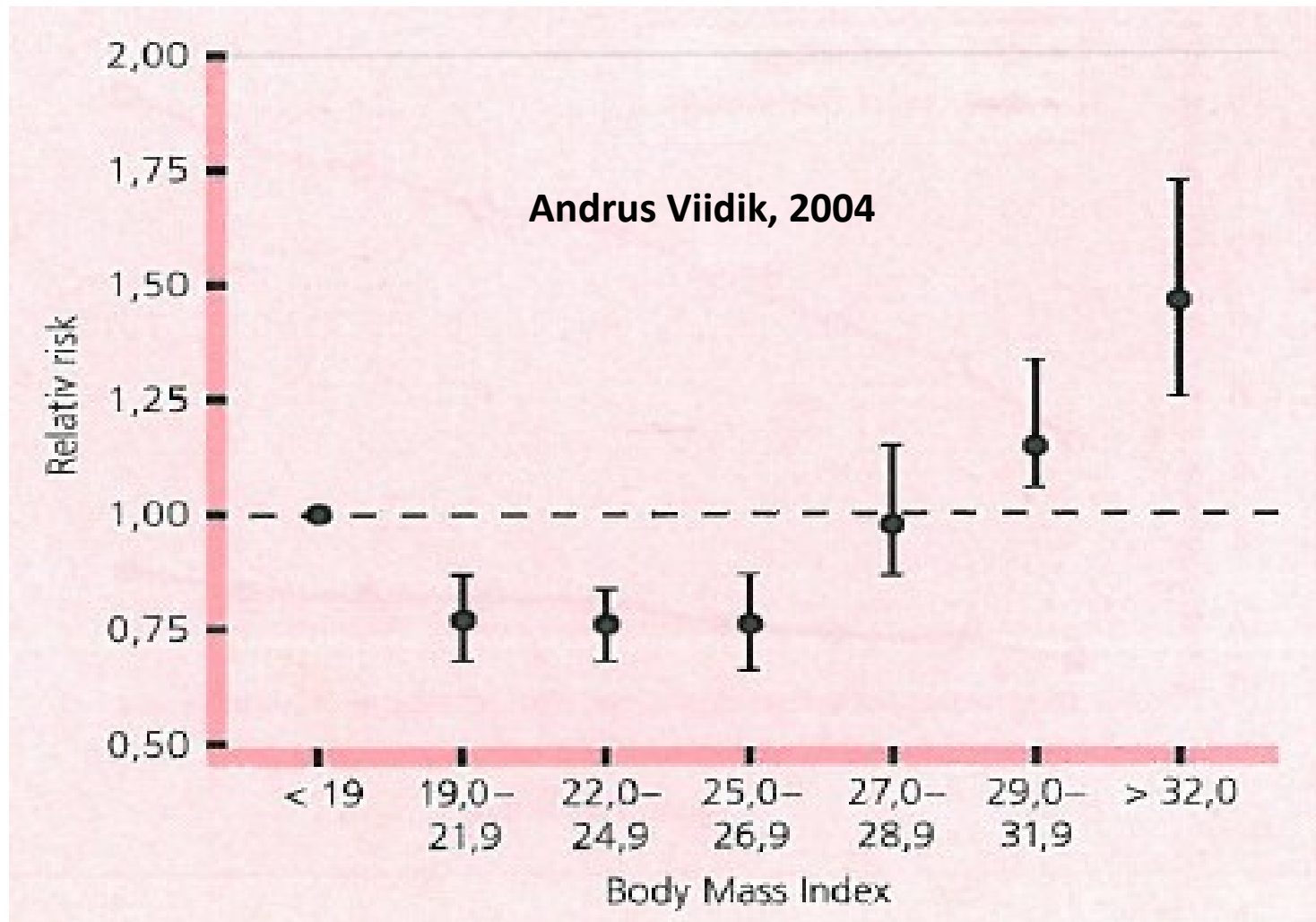
Obesity could decline life expectancy
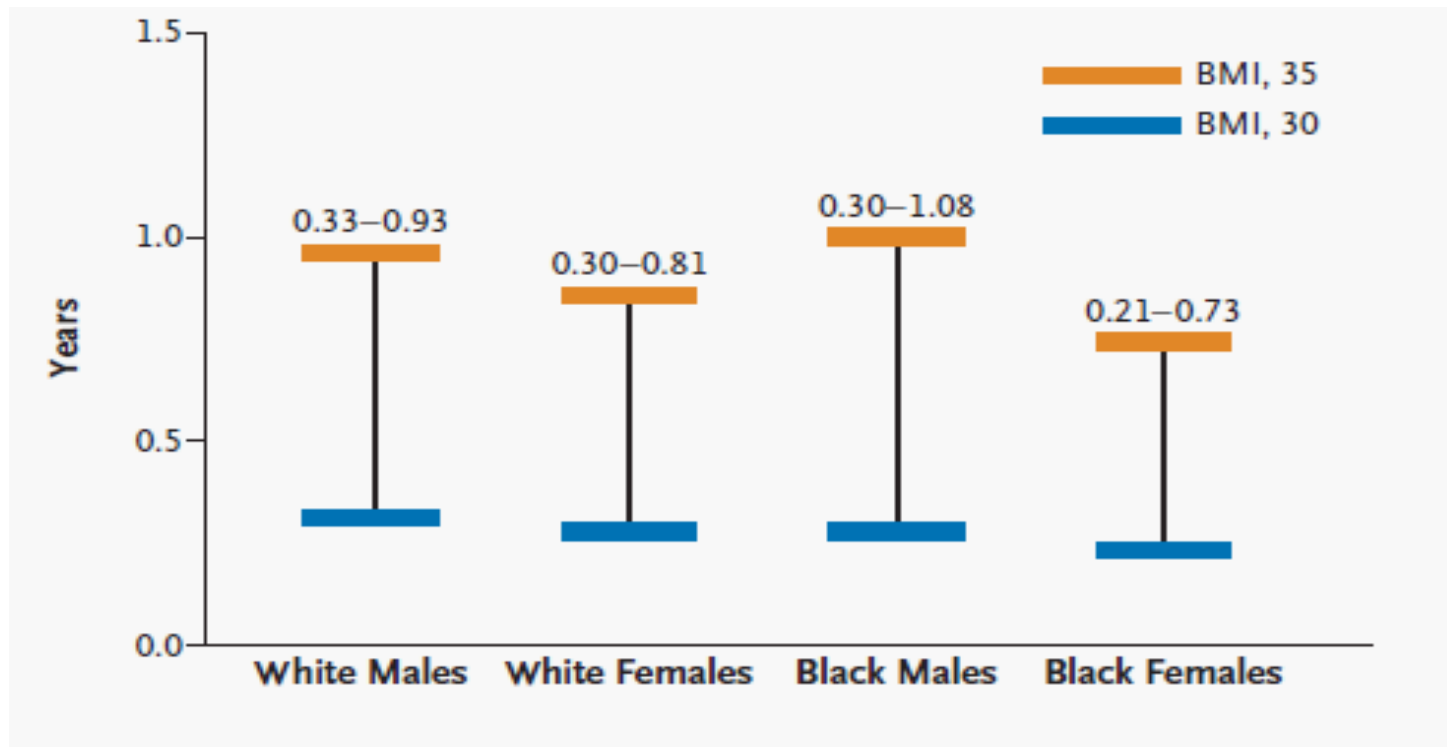
Olshansky et al. NEJM, 2010

Figure 1. Life-Shortening Effect of Obesity According to Race and Sex in the United States in 2000.

This figure shows the potential gain in life expectancy at birth for the U.S. population in 2000, by race and sex, if obesity were eliminated. The range of estimates is shown between the bars on the basis of the assumption that everyone who is obese has a body-mass index (BMI) between 30 (lower bar) and 35 (upper bar) and acquires the risk of death of people with a BMI of 24. The horizontal bars are not error bars.

Treatment of high BP and diabetes to improve general health in old age

A 12 months RCT (IG=106 vs CG=108) to improve depression, glycemic control and BP and lipid control. Outcome: disability, QoL and ADL

Results

➢ **Disability:**   IG vs CG difference -0.9 (-1.5 - 0.2; p 0.006)

➢ **QoL**   IG vs CG difference +0.7 (0.2 – 1.2; p 0.005)

➢ **ADL**   IG vs CG difference -1.5 (-3.3 – 0.4; p 0.1)

Von Korff et al BMJ, 2011:343:d612doi

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LOOK AT THESE AMAZING TEST RESULTS!

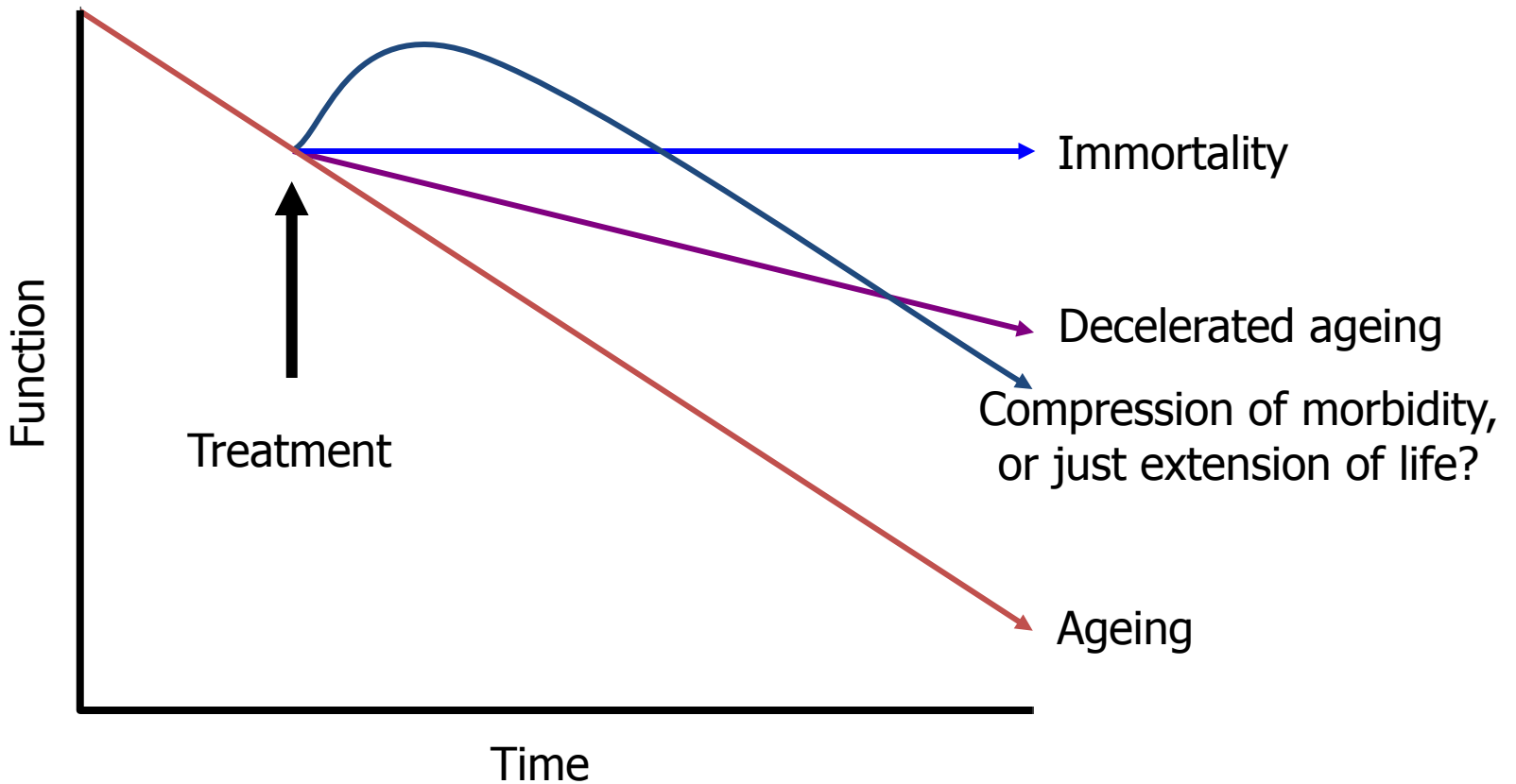Results from a study: [Effects of Growth Hormone administration on 202 patients ages 39-74]

L. Casserry M.D., Ph.D. and Edmund Chein, M.D., Medical College of Wisconsin and Palm Springs Life Extension Institute.

Body Fat Loss	82% improvement
Wrinkle Reduction	61% improvement
Energy Level	84% improvement
Muscle Strength	88% improvement
Sexual Potency	75% improvement
Emotional Stability	67% improvement
Memory	62% improvement

Perls TT. J Gerontology 2004; 59A: 682-91

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Effect of anti-ageing treatment,

- Immortality
- Decelerated ageing
- Compression of morbidity, or just extension of life?
- Ageing

Treatment

Function

Time

Reduced prevalence of cognitive impairment in USA

Langa KM et al, Alzheimer and Dementia 2008;

Examination   Cognitive impairment

1993 - 95 (n= 7 406), 70 ys+   12,2 %

2002 - 04 (n= 7 104), 70 ys+   8,7 %

Explanation

In the cohort examined between 2002- 04 there were more people with higher education that continued cognitive stimulation during work and leisure activities.

More participants had adequately treated diabetes and hypertension,