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# Demographics of Aging and Geriatric Syndromes

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# Demographic Trends for Older Adults

12.5% of the U.S. population is currently over 65

By 2030 it is expected there will be 68 million Americans older than 65 or 20% of the population

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# Old Age Ain't for Sissies





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# Life Expectancy

In 1900 life expectancy was 47.3 years

By 1950 life expectancy was up to 68.2 years

Current life expectancy is about 78 years

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# Gender and Aging

Women outlive men - for every 100 women in the over 65 age group there are only 69 men

Current life expectancy for women is 80.2 years for men it is 73.2 years

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1875-1997

**Jeanne Calment**

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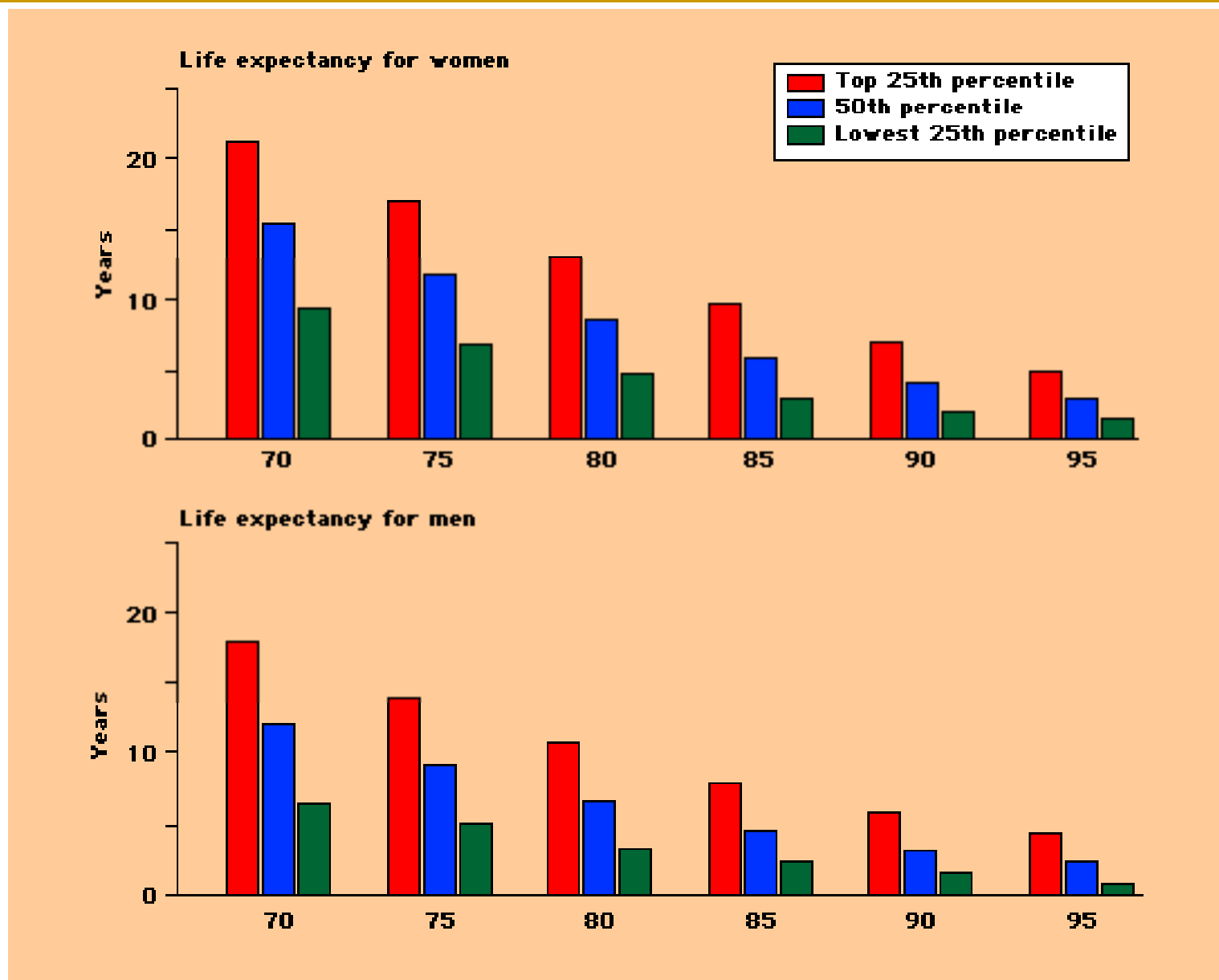
# Life Expectancy

At age 65 life expectancy is about 19 more years

At age 75 life expectancy is about 12 more years

At age 85 life expectancy is about 7 more years

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**Life expectancy** The upper, middle, and lower quartiles of life expectancy for women and men at selected ages are shown. Data from Walter, LC, Covinsky, KE, JAMA 2001; 285:2750.

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# Race and Aging

The geriatric population is becoming more ethnically diverse in the U.S.

Currently the non-hispanic white are 73.6 % of the elderly but expected to decline to 60.5% by the year 2030

Increases in the Hispanic-American and Asian-American populations are expected

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# Marital Status and Aging

In the community 75% of men over 65 are likely to be married and living with their spouse

41% of women over 65 are married and living with their spouse

47% of women over 65 are widows

13% of men over 65 are widowers

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# Living Arrangements

Likelihood of living alone increases with aging

In the 65-74 age group 31% of women and 13% of men live alone

In the over 75 age group 52% of women and 21% of men live alone

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# Living Arrangements

Only 4-5 % of the over 65 age group live in nursing homes - the rest live in the community

47% of the over 95 age group live in nursing homes

1.4% of the 65-74 age group live in nursing homes

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# Living Arrangements

95% of the over 65 age group live in the community

Support systems exist - elder care agencies, home nursing, meals on wheels, age centers

Informal supports - family members, friends, neighbors

Adult Day Care

PACE (Program for all-inclusive care) Model

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# Education

Between 1970 and 2001 the percentage of elderly who had completed high school increased from 28% to 70%

By 2030 estimated that 83% will have completed high school

By 2030 estimated 24% with bachelor's degree up from 15%

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# Economics of Aging

Before Medicare was enacted in 1959 35% of those over age 65 were living below the poverty line as only 60% received Social Security

By 1994 only 12% were living below the poverty line as over 92% received cash benefits from Social Security

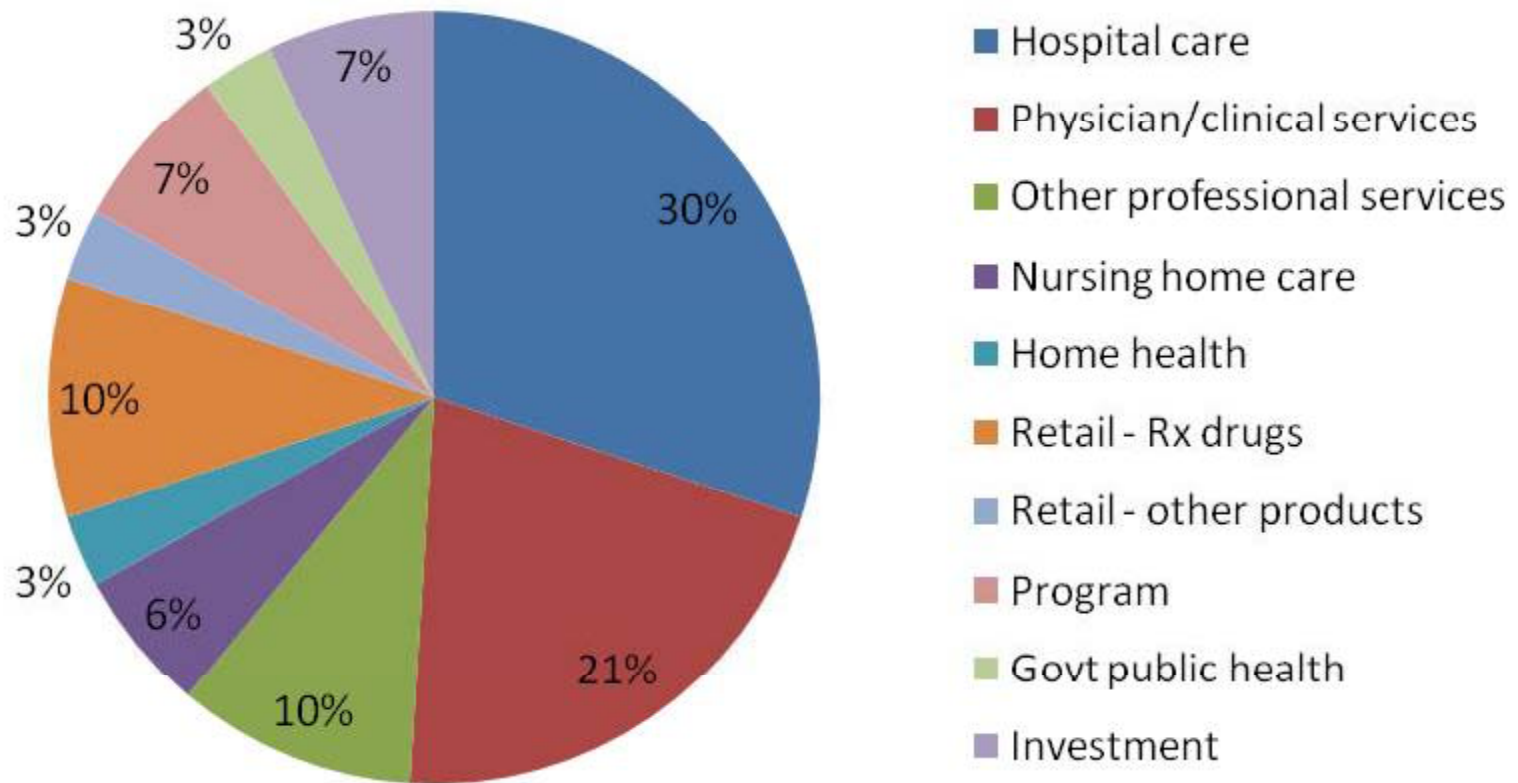
By 2004 poverty rate has declined to 9.8% for those over age 65

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# Health Care Costs



## U.S. National Health Expenditures, 2006

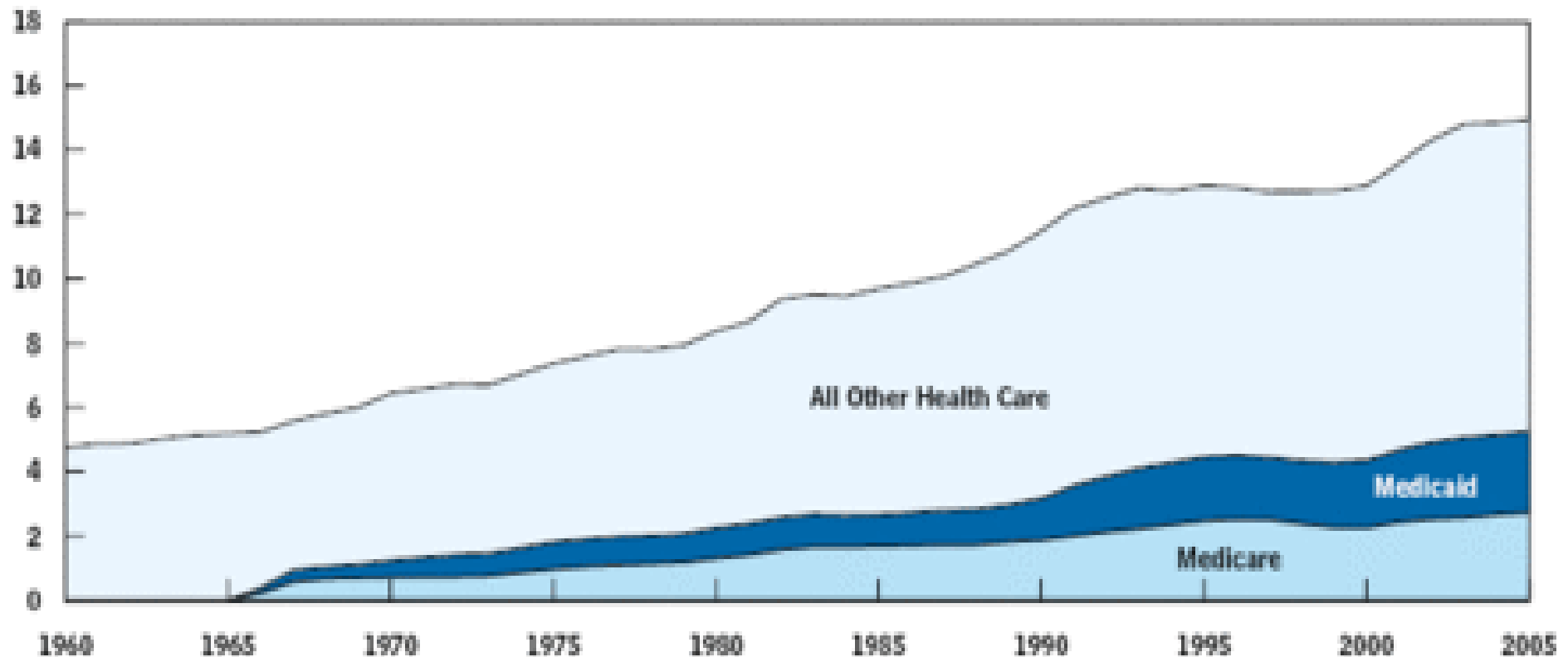


Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group.

**Figure 2.**

## Spending on Health Care as a Percentage of Gross Domestic Product, 1960 to 2005

(Percent)

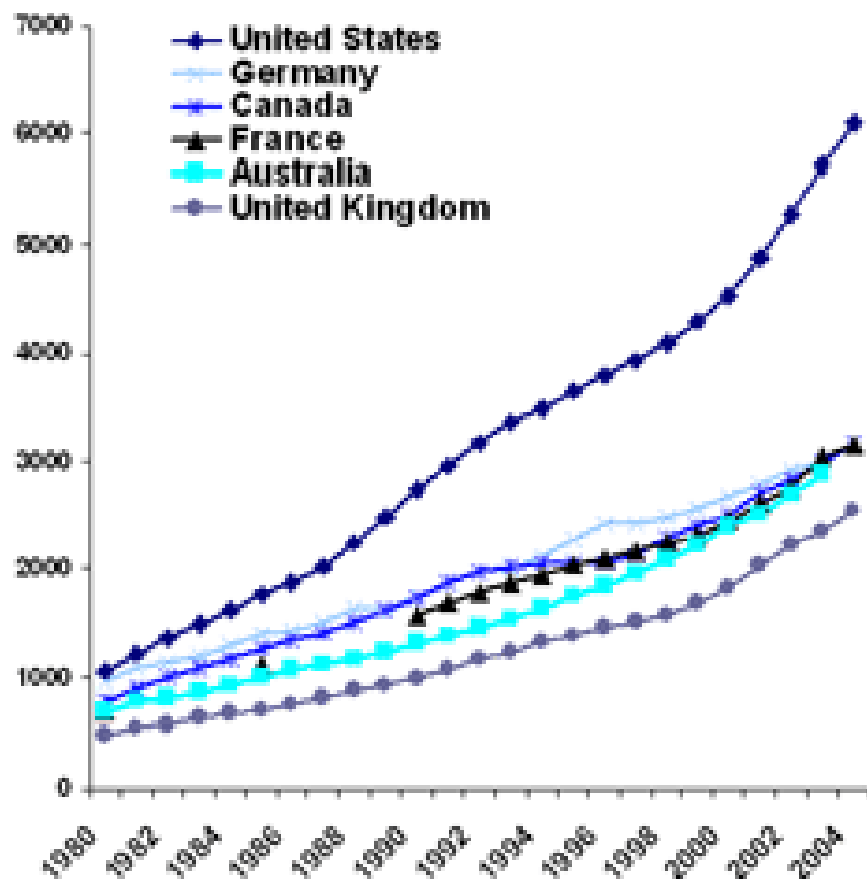


Source: Congressional Budget Office based on data on spending on health services and supplies, as defined in the national health expenditure accounts, maintained by the Centers for Medicare and Medicaid Services.

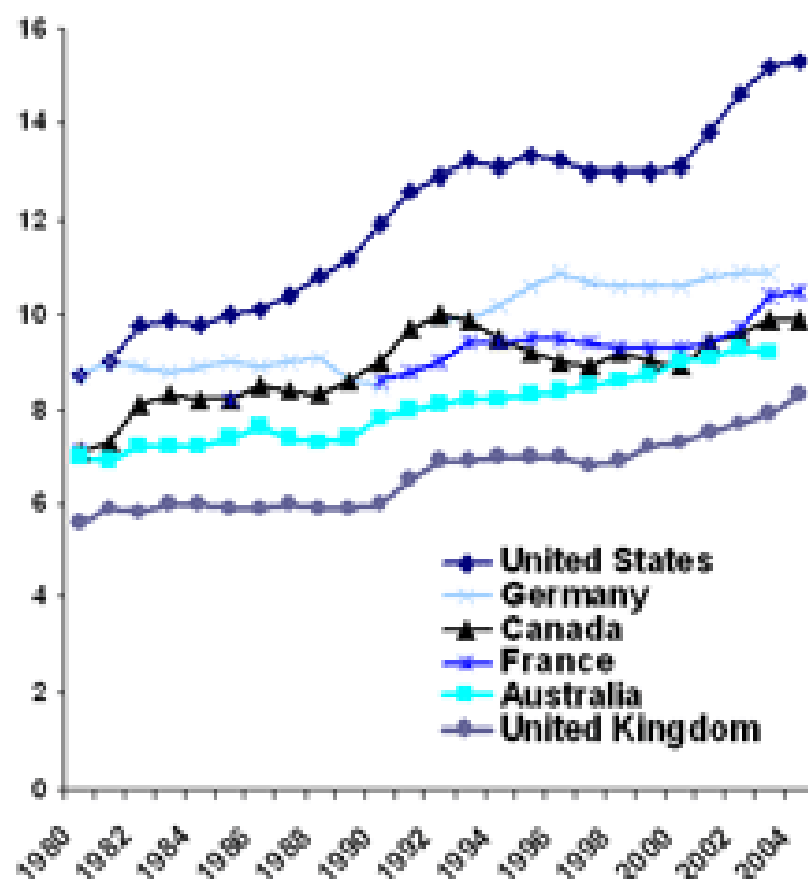
Note: Amounts for Medicare are gross federal spending on the program. Amounts for Medicaid include spending by the federal government and the states.

# Figure ES-1. International Comparison of Spending on Health, 1980–2004

## Average spending on health per capita (\$US PPP)



## Total expenditures on health as percent of GDP



Data: OECD Health Data 2005 and 2006.

Source: Commonwealth Fund National Scorecard on U.S. Health System Performance, 2006.

# Life expectancy in the 14 highest ranking and selected other WHO countries by sex , 2006



The World Health Organization's ranking of the world's health systems.

- 1 France
- 2 Italy
- 3 San Marino
- 4 Andorra
- 5 Malta
- 6 Singapore
- 7 Spain
- 8 Oman
- 9 Austria
- 10 Japan
- 11 Norway
- 12 Portugal
- 13 Monaco
- 14 Greece
- 15 Iceland
- 16 Luxembourg
- 17 Netherlands
- 18 United Kingdom
- 19 Ireland
- 20 Switzerland
- 21 Belgium
- 22 Colombia
- 23 Sweden
- 24 Cyprus
- 25 Germany
- 26 Saudi Arabia
- 27 United Arab Emirates
- 28 Israel
- 29 Morocco
- 30 Canada
- 31 Finland
- 32 Australia
- 33 Chile
- 34 Denmark
- 35 Dominica
- 36 Costa Rica
- 37 United States of America



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# Health Care Costs

12.5% of the population is over 65

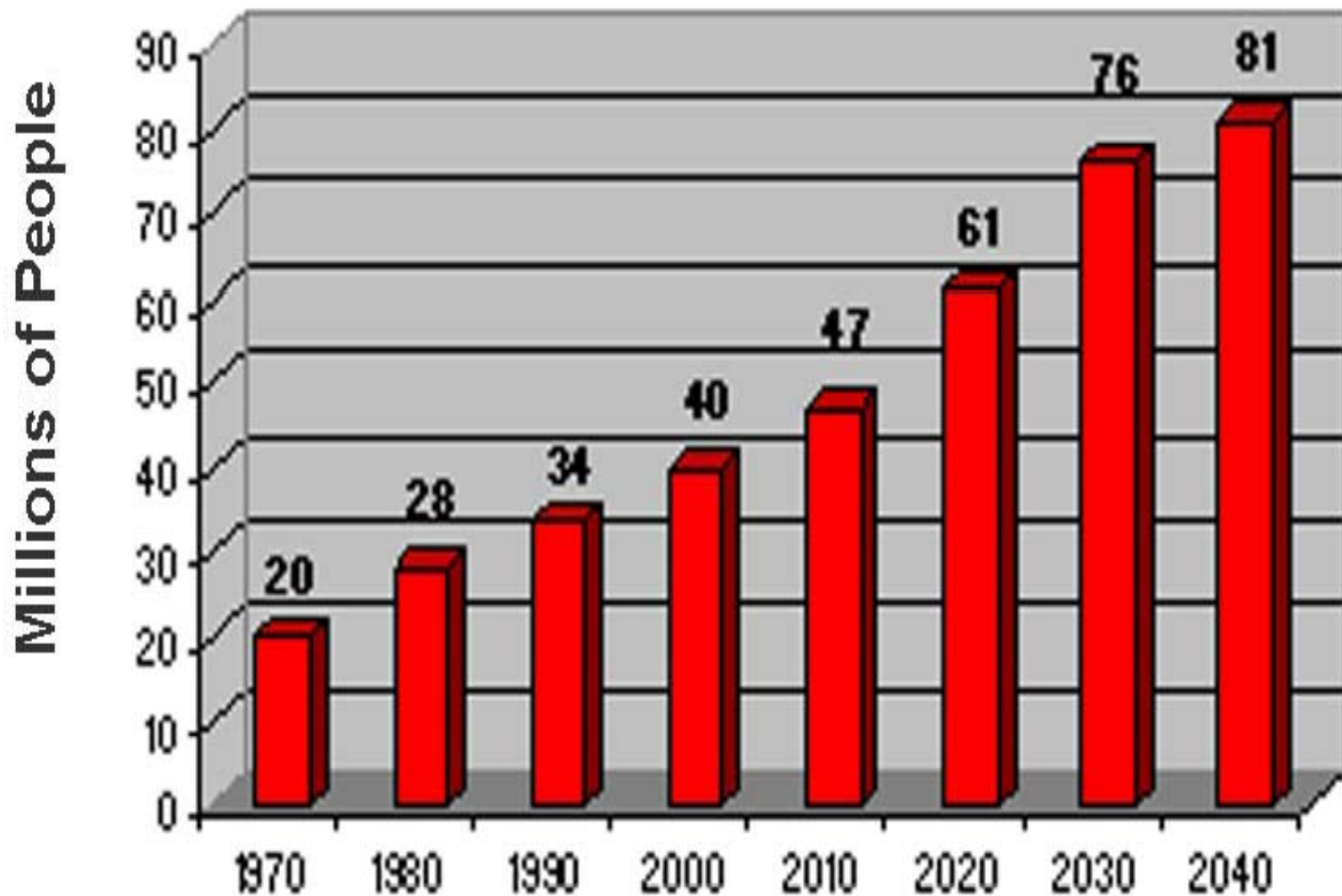
They account for 36% of the health care costs

The sickest 5% account for 37% of the cost

The least expensive 50% account for only 6% of the total cost

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# Medicare Enrollment Soars



Source: Health Care Financing Administration

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# We Are About to Break the Bank



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# Some Possible Solutions

Development of a Health Care System with cost containment features

Focus on quality

Primary care

Payment reform

Education payment reform

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# Why Study Geriatrics?

Changing Demographics

Control Costs

Improve quality of life and care

Normal age-related changes vs. pathologic

Minimize morbidity

Maximize function

Biopsychosocial model of care

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# Geriatrics is Challenging

Age is not an accurate predictor of condition or function

Co-morbidities are common

Presentation of illness is altered (non-specific)

Homeostatic control is less efficient

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# Functional Status

The single best predictor of institutionalization is impaired functional status

Self-reported function is an accurate predictor of health risks and costs

23% of older adults report some functional limitation in either ADLs or IADLs much higher percentage for the oldest segments

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# ADL: Activities of Daily Living

Bathing

Dressing

Transferring

Toileting

Grooming

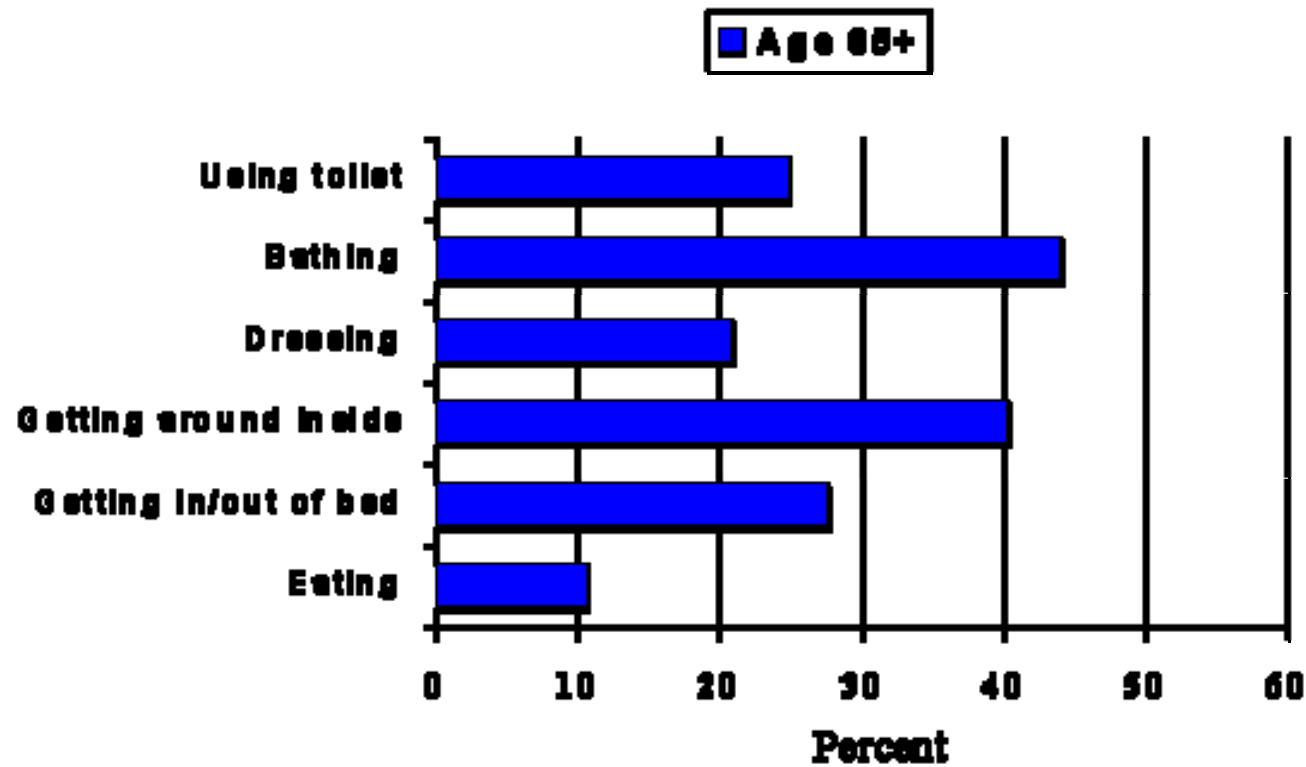
Feeding

Mobility

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## Average Percent Needing Help with Activities of Daily Living (ADL) - 1982 to 1994



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# IADL: Instrumental Activities of Daily Living

Telephone

Meal preparation

Managing finances

Taking medications

Doing laundry

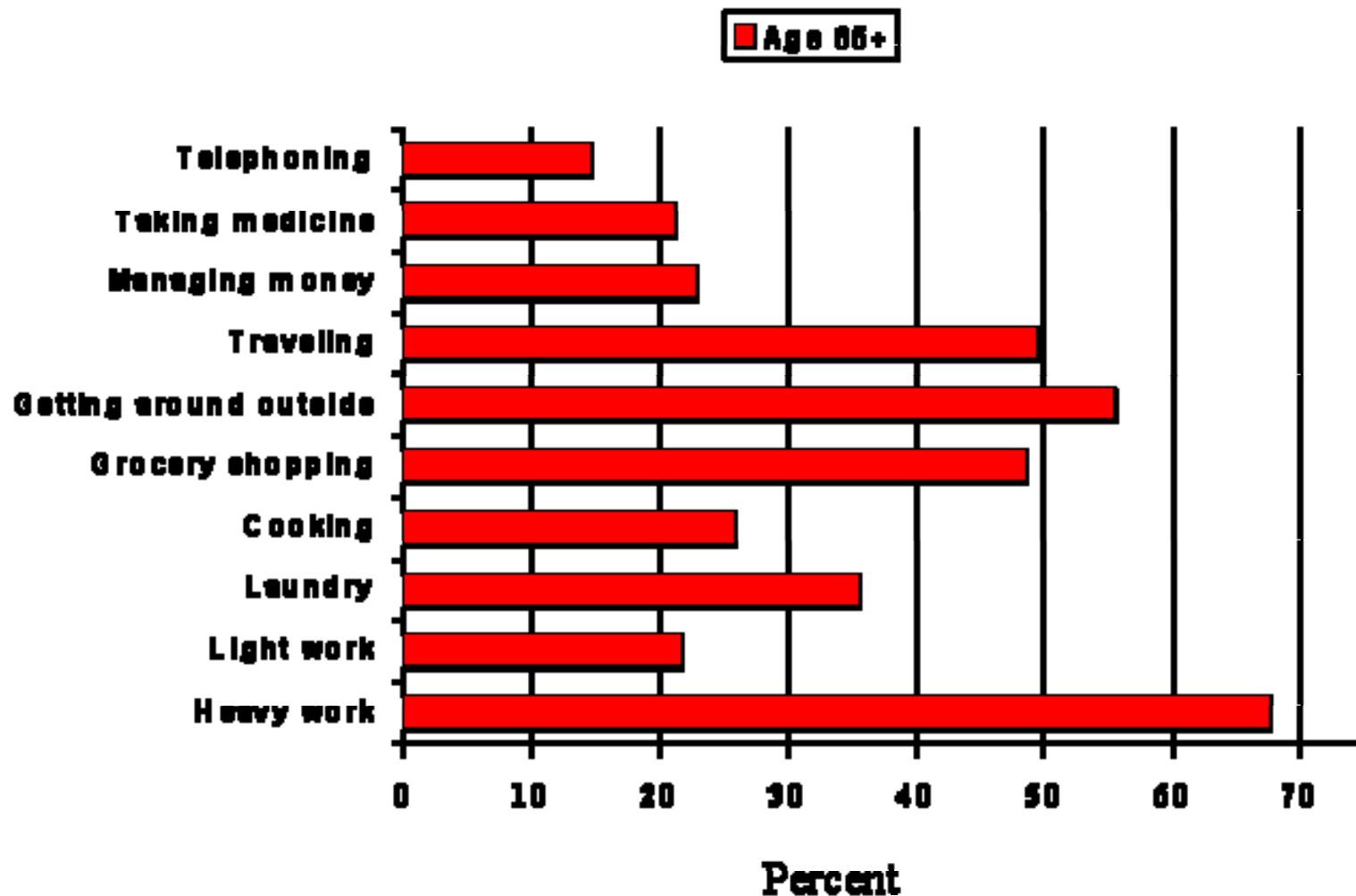
Doing housework

Shopping

Managing transportation

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## Average Percent Needing Help with Instrumental Activities of Daily Living (IADL) - 1982 to 1994



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# General Principles of Age-related Changes

You dry out as you age

You get stiffer with aging

Genetic errors and cancer risk increase with time

Homeostatic mechanisms are stressed

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# Organ System Age-related Changes: Skin

Thinner

Drier

Reduced sweat and sebum

More injury prone

Less elastic

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# Musculoskeletal system

Decreased muscle mass

Decreased innervation

Slowed reaction time

Bone mass declines

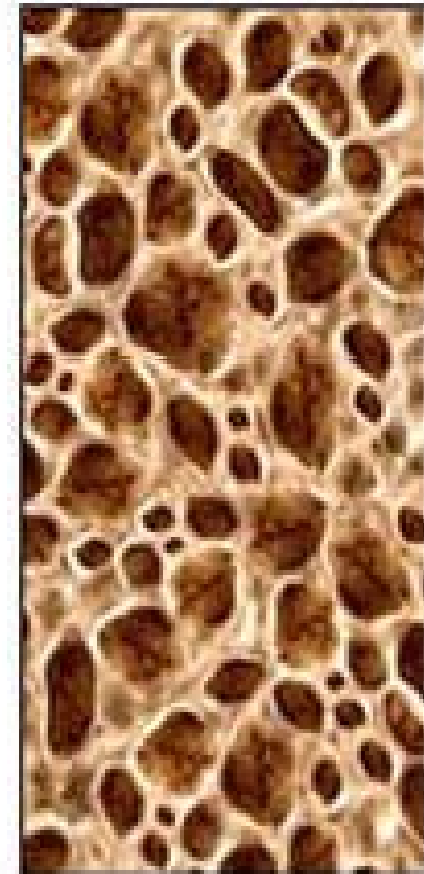
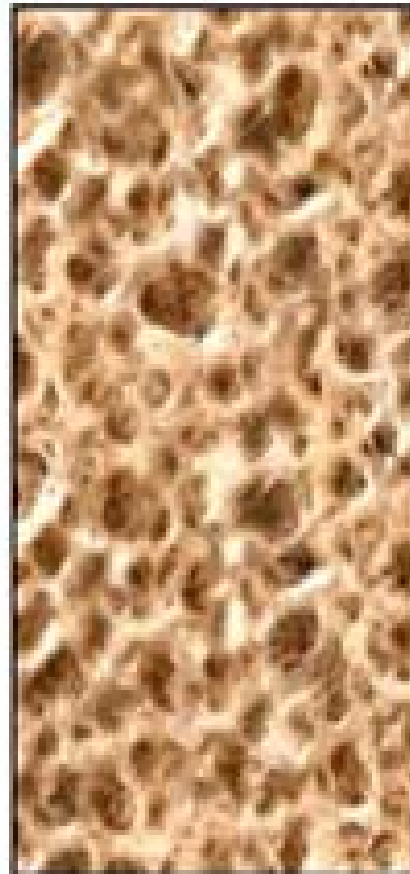
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Normal Bone

Bone with  
Osteoporosis



Bone section  
through hip



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# Factors Contributing to Osteoporosis and Osteomalacia

Medications

Hormonal changes

Vitamin D and Calcium deficiencies

Smoking

Inactivity

Medical disorders

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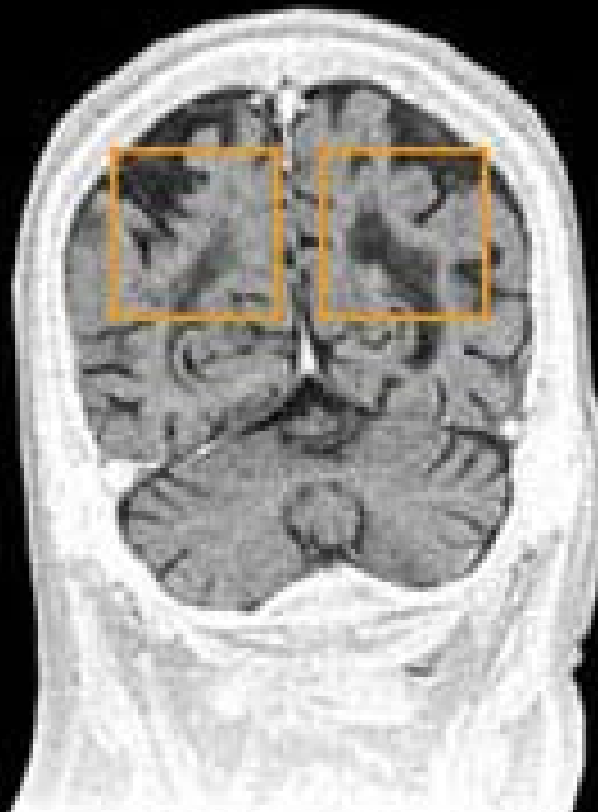
# Nervous System

Changes in neuro transmitter levels

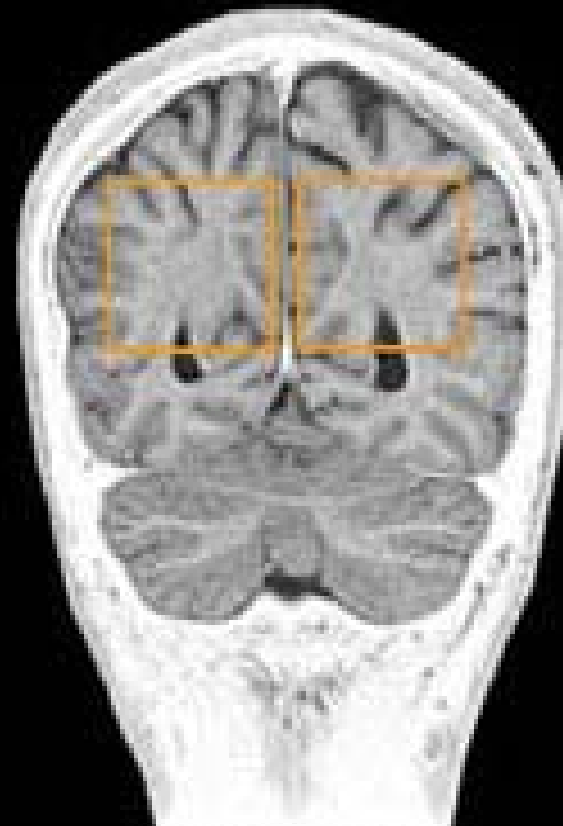
Decreased cerebral blood flow

Brain mass declines

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87 Year Old



27 Year Old

Location of  
these scans  
in the brain



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# Vision

Presbyopia from lens and iris changes, declining vision leads to functional problems.

Visual impairment affects 20-30% of those over 75

Cataracts and refractive error can be corrected and improve quality of life

Age –related macular degeneration (ARMD) is common and may lead to blindness. Laser surgery or intravitreal anti-angiogenesis injections may help. Anti-oxidant vitamins may slow progression

Glaucoma is common (affects >2.25 million over age 40) and treatable

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# Hearing

Hearing – decline in central auditory processing, thicker ear drum, changes in the cochlea lead to decline in hearing.

Hearing loss is common and affects 25% of those over 75

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# Taste and Smell

Decreased ability to taste and smell

Unpalatable medical diets may lead to malnutrition

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# Cardiovascular

Increased systolic and diastolic BP, LV wall thickness and stiffness

Decreased adrenergic response, maximal heart rate, cardiac output, LV relaxation and compliance, diastolic filling

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# Pulmonary

Loss of elasticity leads to restrictive and obstructive disease

Decreased resting pO<sub>2</sub> seen with less perfusion of lower lung fields

Less vigorous cough and slower less effective mucociliary clearance increases susceptibility to infection.

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# GI

Alterations in dentition and and swallowing are important

Autonomic dysfunction and inactivity may lead to constipation

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# Renal

Clinically important steady decline in function

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# Hematopoietic

Red cell life span is unchanged

Lymphocyte levels decline

Neutrophil levels remain constant

Platelets unchanged

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# Genitourinary

Women have menopause and its consequences, atrophy of vulva and vagina, involution of glandular and stromal tissue in the breast.

men have prostatic hypertrophy decreased erectile and ejaculatory function

Sexual function is an interplay of physical, cultural, and psychosocial factors

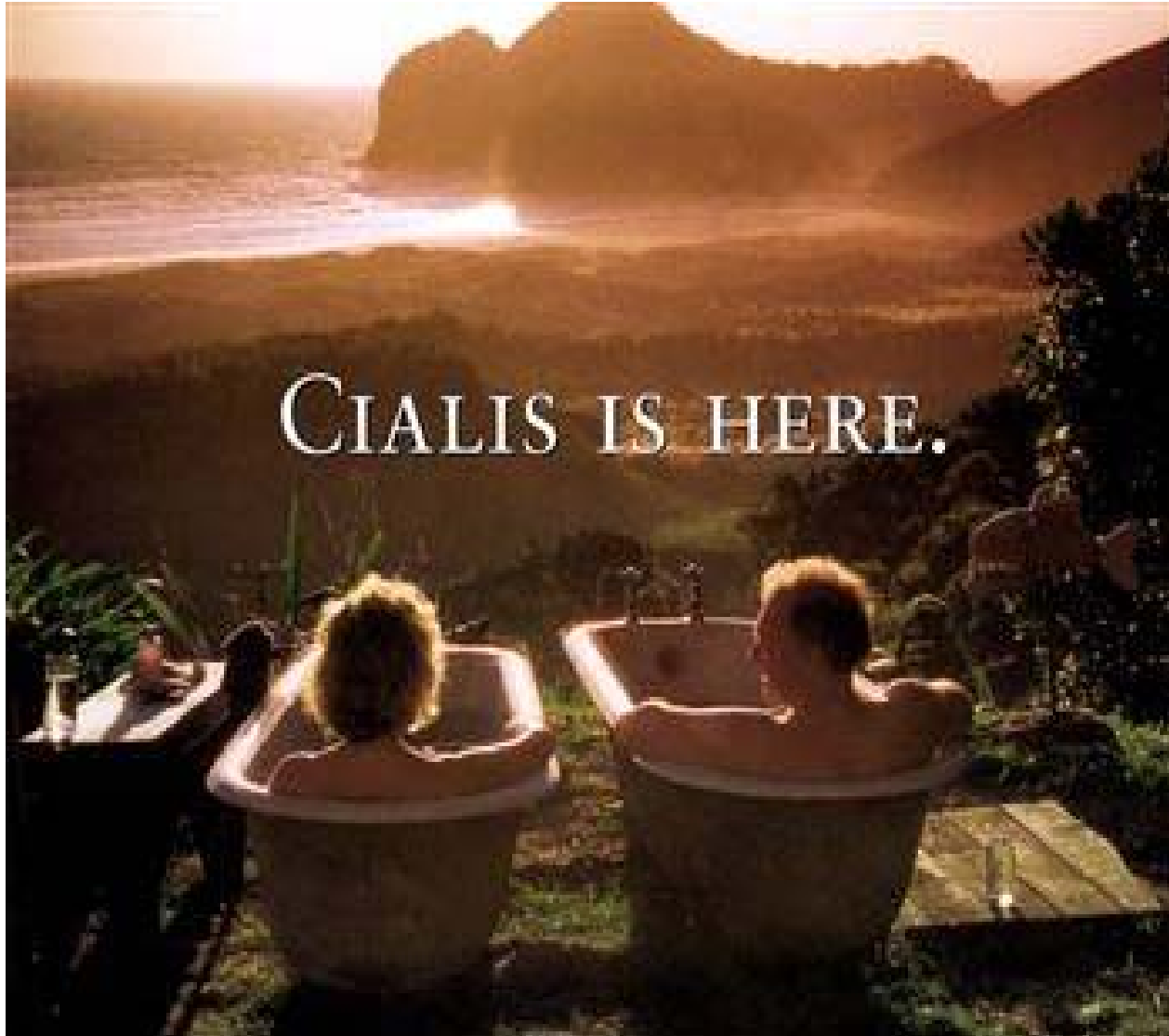
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Mike Ditka NFL Hall of Fame Player and Coach



LEVITRA

levitra.com



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# Homeostenosis

You are only as strong as the weakest link in the chain

Stress theory

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# Geriatric Syndromes

Common presenting complaints should make alarms sound in your head to think comprehensively.

These presenting complaints are likely to have multifactorial causes

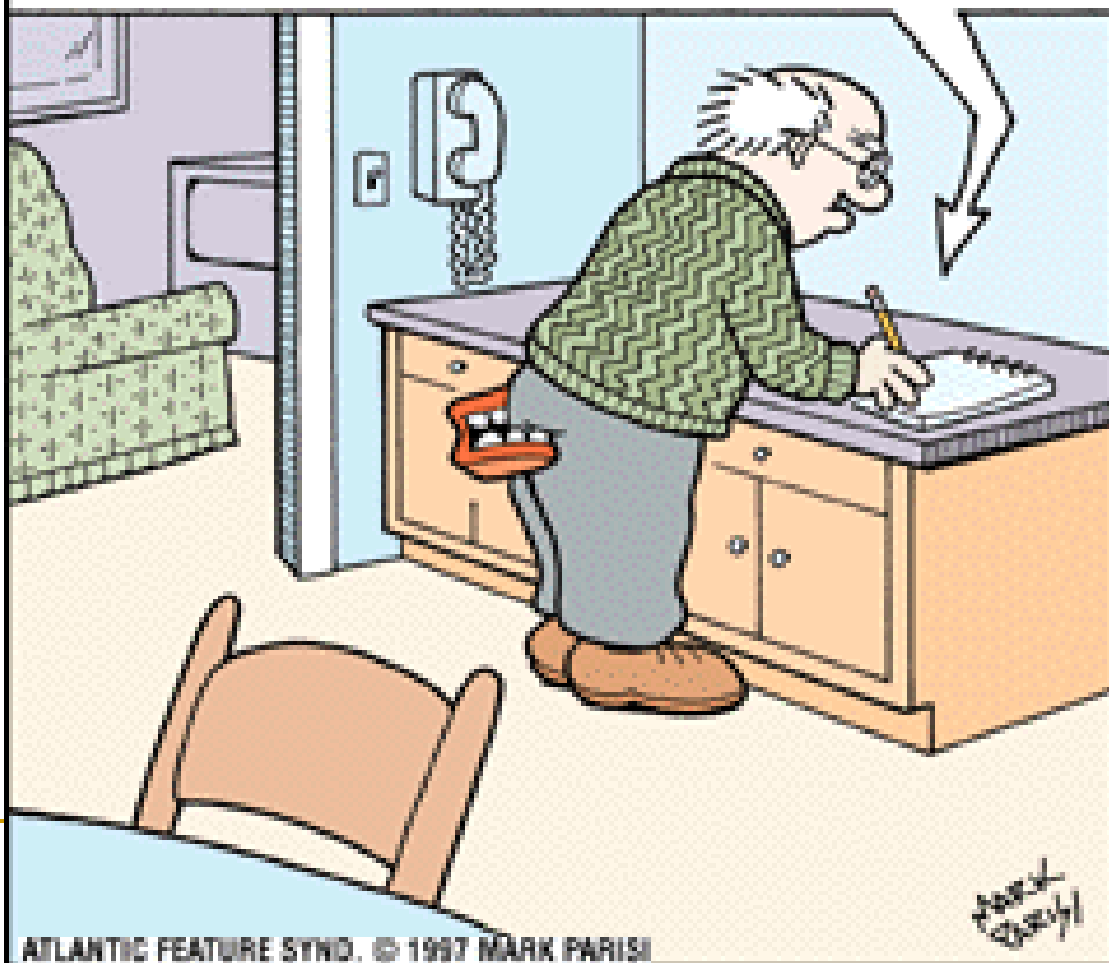
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# off the mark

by Mark Parisi

www.offthemark.com

1. CALL DENTIST ABOUT MISSING DENTURES.
2. CALL DOCTOR ABOUT EMBARRASSING NEW DISCOMFORT.



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# Some Common Geriatric Syndromes

Cognitive impairment

Incontinence

Falls

Weight loss or failure to thrive

Polypharmacy

Dizziness and Syncope

Pressure Ulcers

Osteoporosis and Osteomalacia

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Dementia

Falls

Polypharmacy

Weight Loss

Functional Decline

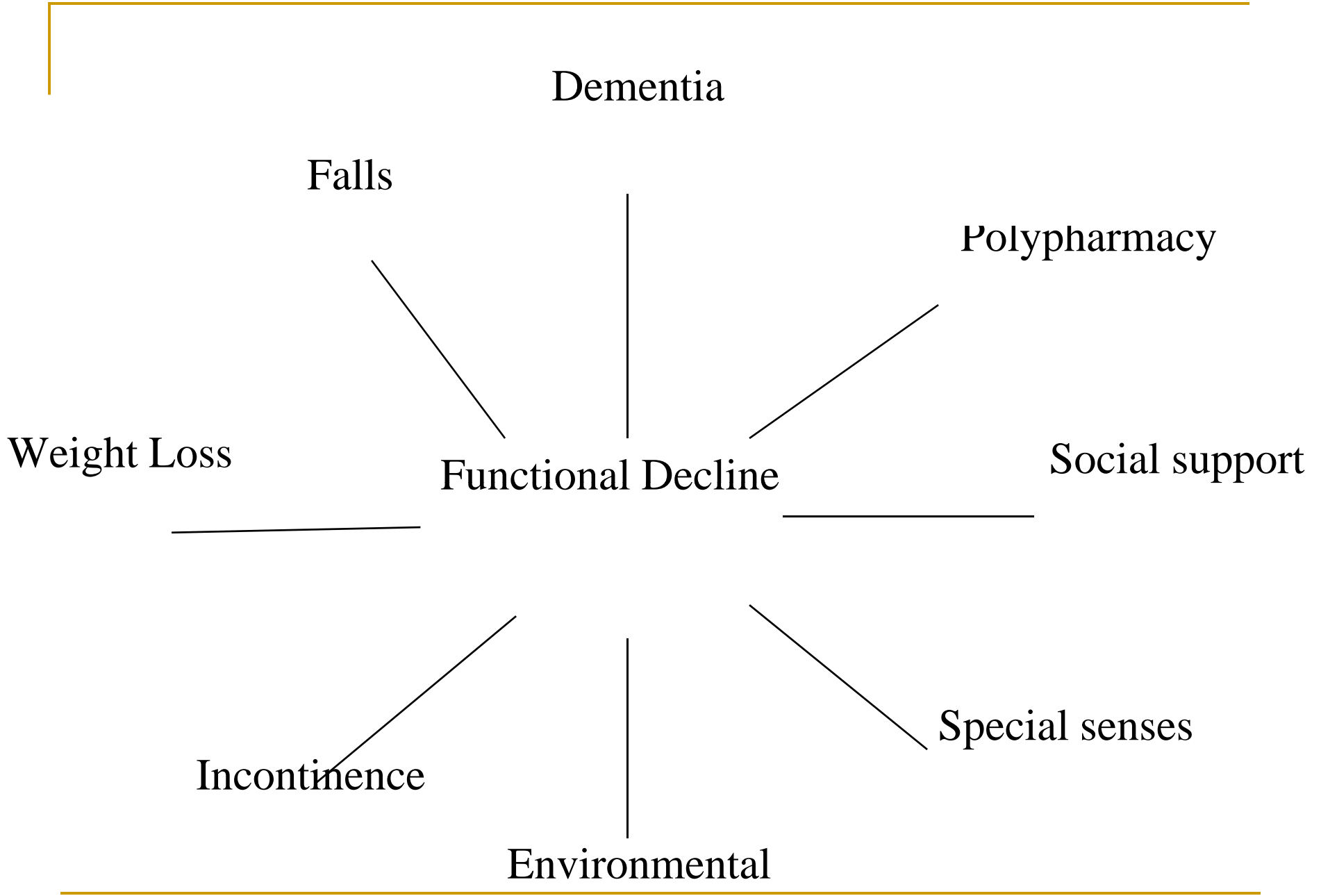
Social support

Incontinence

Special senses

Environmental

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# Cognitive impairment

## Many causes

Delirium

Dementia

Depression

Sensory impairment

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# Incontinence

Affects 15-30% in the community and over 50% in long term care

Urinary tract disorders

Neurological disorders

Functional disorders

Environmental problems

Social problems

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# Falls

Leading cause of death from injury for those over 65

Medical disorders

Gait Disorders

Motor problems

Sensory problems

Risk taking behaviors

Special senses

Environmental

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# Polypharmacy

The elderly account for 33% of drug costs in the U.S.

The risk of an adverse drug reaction is proportional to the number of drugs a person is taking

The average elderly person is on 4.5 prescription drugs and 3.5 OTC drugs at any given time

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# Failure to thrive

Bio

Psycho

Social

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# Psychosocial Aspects of Aging

## Common themes

Loss

Loneliness

Education

Personality style

Religion /Spirituality

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# Successful Aging

higher educational level

no smoking

moderation in drinking

religion / spirituality

flexibility of thought - a positive outlook

support systems in place

eating breakfast daily

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What features pictured  
predict successful aging?

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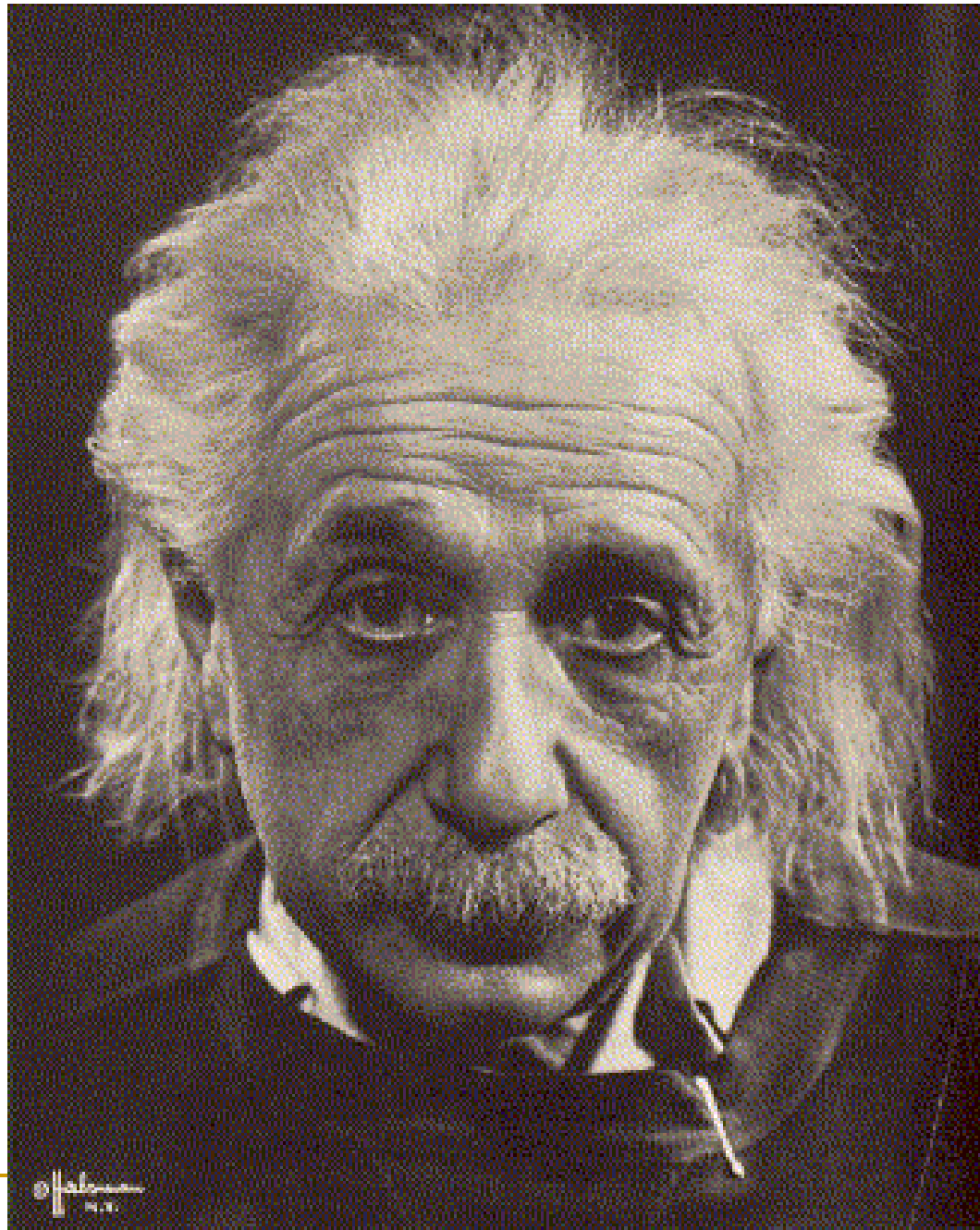




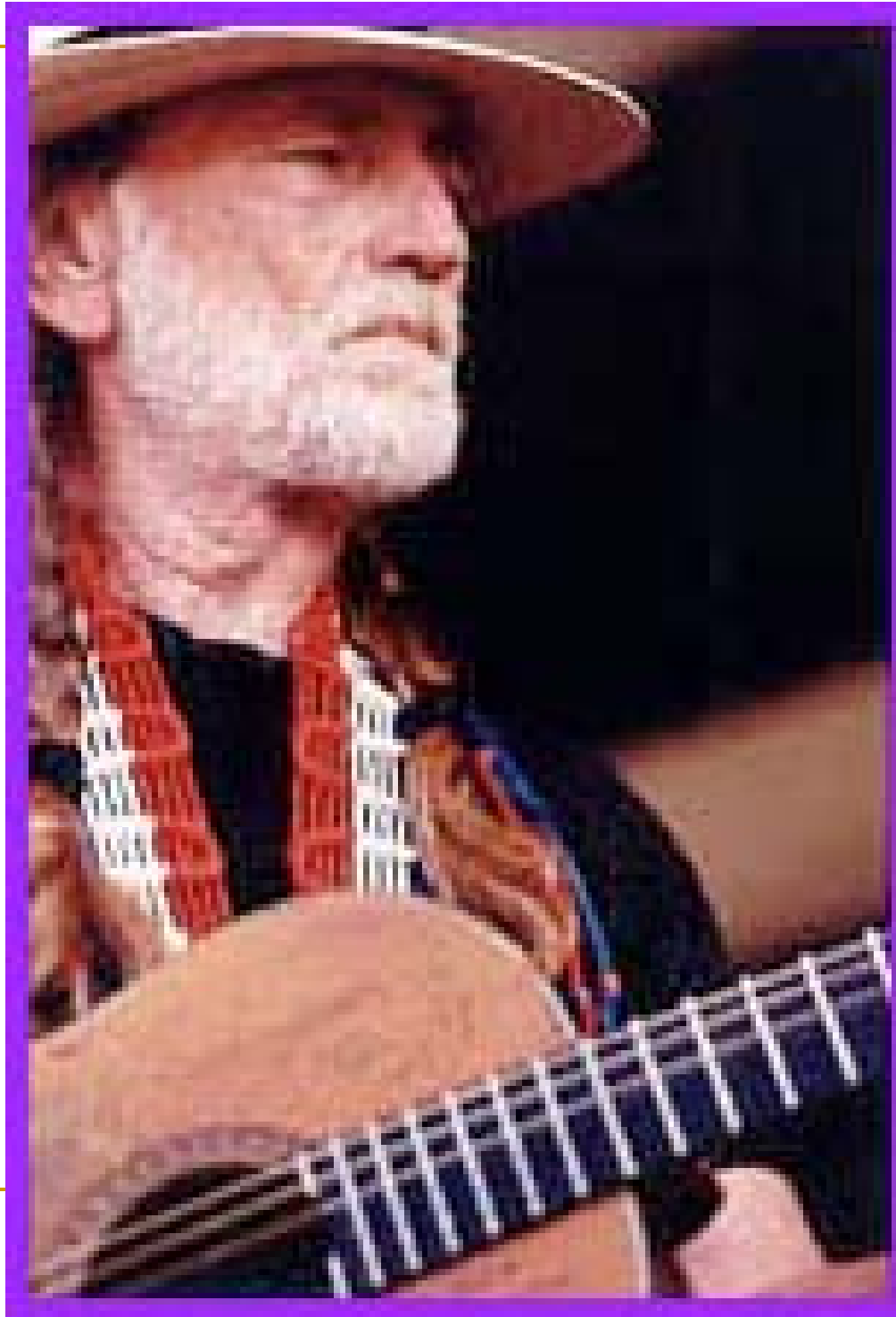












**THE 2000  
YEAR OLD MAN  
IN THE YEAR 2000**

**THE BOOK**



{ INCLUDING HOW TO NOT DIE  
AND OTHER GOOD TIPS }

**MEL BROOKS AND  
CARL REINER**

HE FOLD TO EACH OTHER