The NEW ENGLAND JOURNAL of MEDICINE

The Challenges of Aging

Edward W. Campion, MD
Executive Editor
New England Journal of Medicine

Greetings from Boston!

Aging: Dimensions of the Challenge

- Changes in Life Expectancy
- Implications for Global Health
- Challenges for Clinicians
- Prevention
- Impact of Information Technologies
- Hospitals and High-Tech Medicine
- Long-Term Care
- End-of-Life Care
- What Do We Really Want?

Vanity is to wish a long life and take but little pains about a good life.

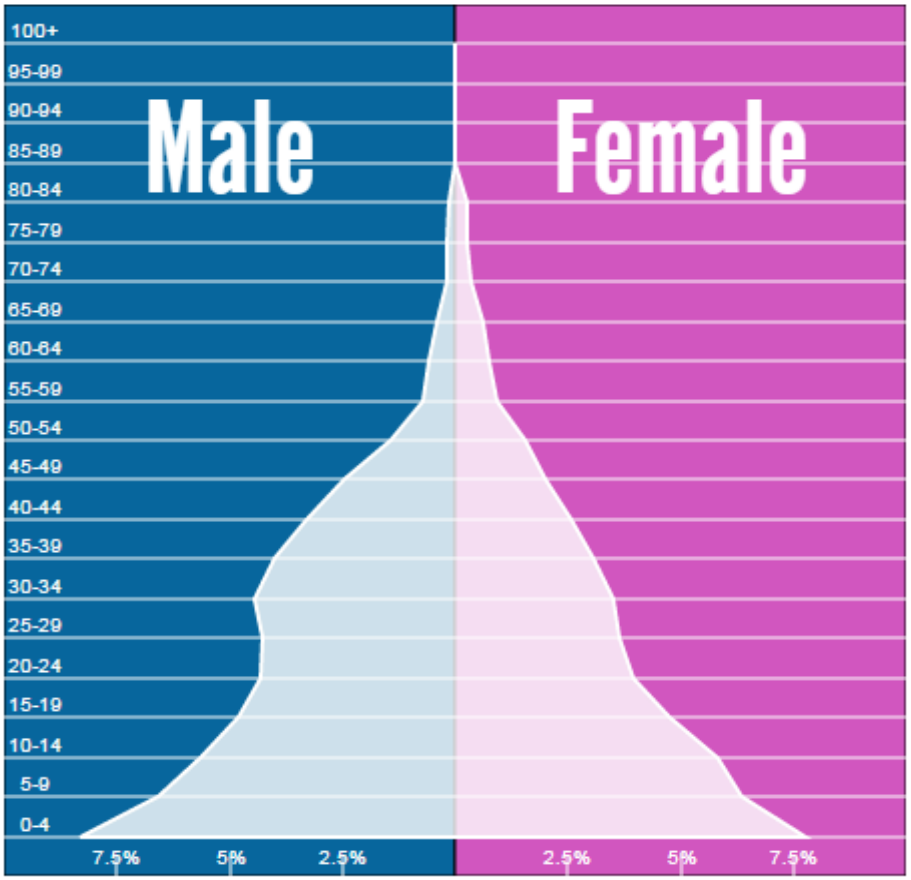
- Thomas à Kempis

Wish not so much to live long as to live well.

- Benjamin Franklin

Singapore 1950

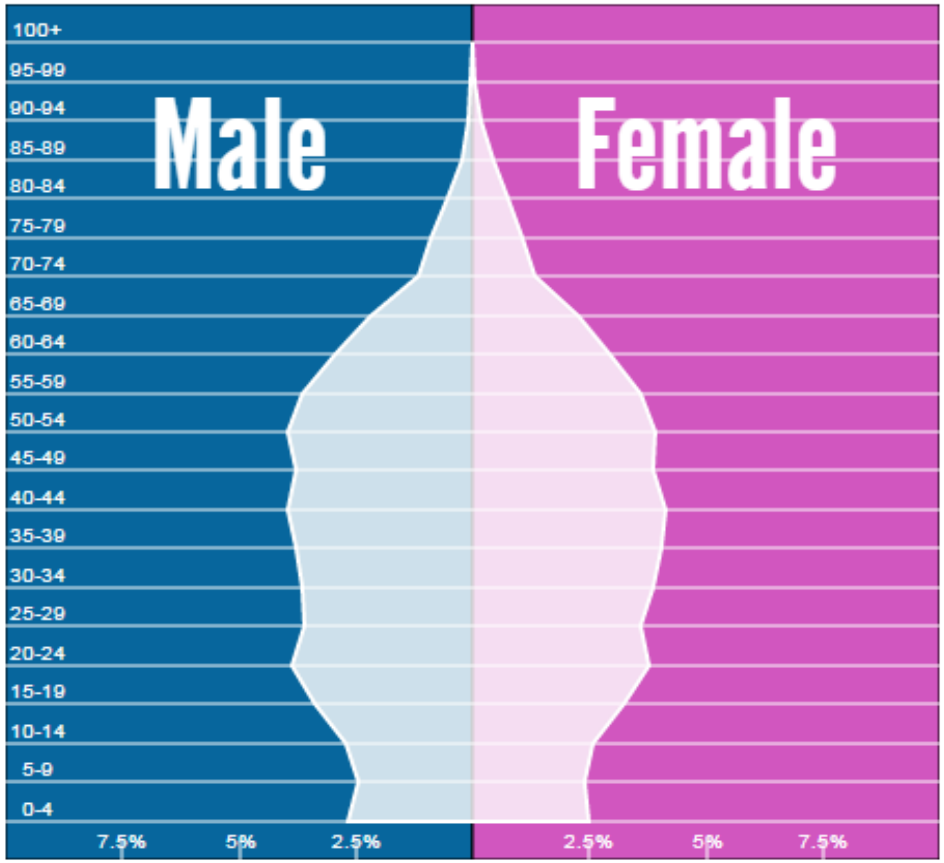
Population: 1.022.000



Link to this graph:
http://populationpyramid.net/singapore/1950/

Singapore 2015

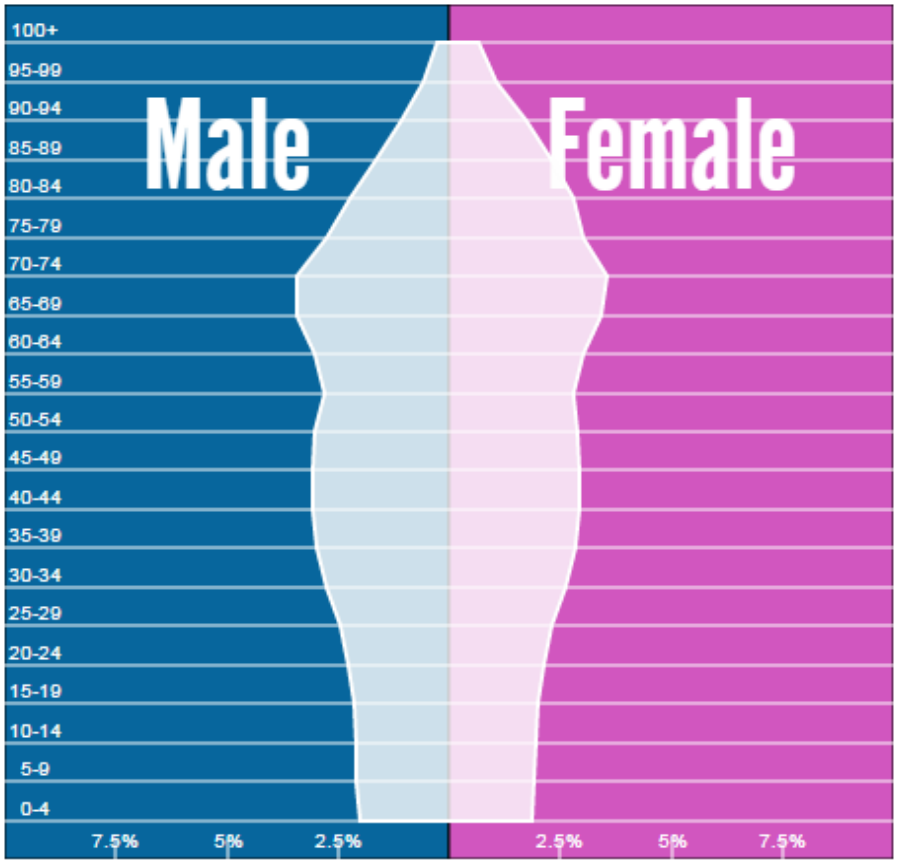
Population: 5.618.000



Link to this graph:

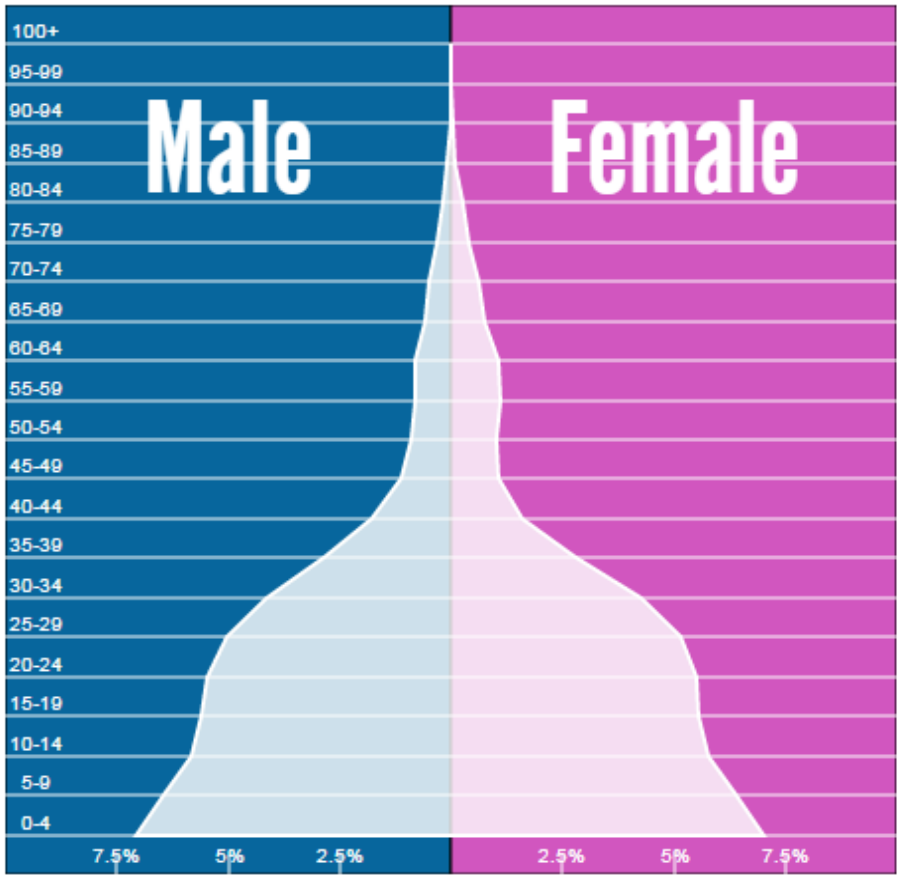
Singapore 2065

Population: 7.060.000



Zimbabwe 2015

Population: 15.046.000



Link to this graph: http://populationpyramid.net/zimbabwe/2015/

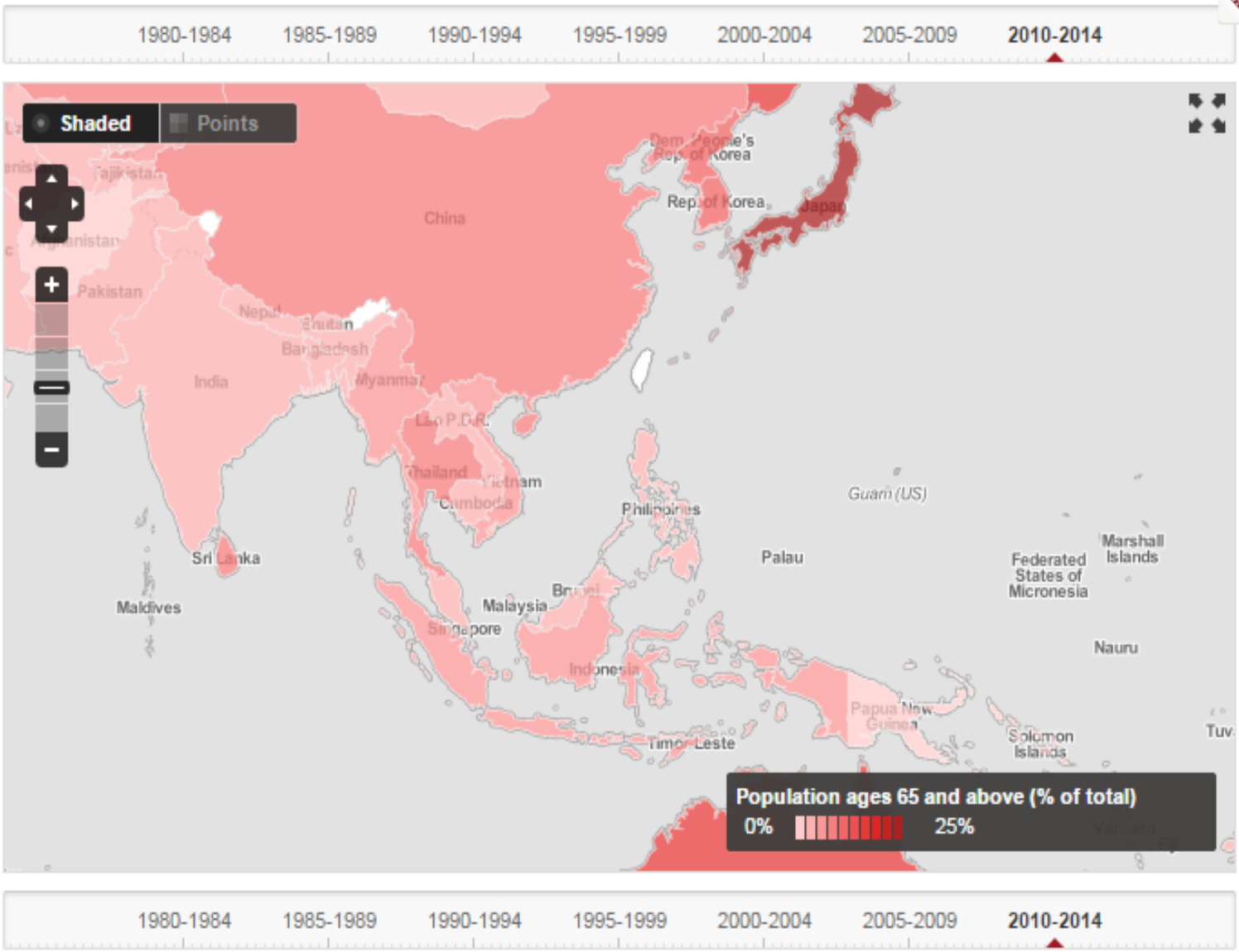
Changes Over Time in Population Aged 65 and Over in Four Countries

	1980	2013		
USA	11%	14%		
Singapore	5%	10%		
Sweden	16%	19%		
Japan	9%	25%		

Years of Life Remaining
(USA. in years)

Age	Men	Women
From Age 65:	17.6	20.2
From Age 75:	10.9	12.8
From Age 85:	5.8	6.9
From Age 95:	2.8	3.3

Rank	state/territory	Overall	Male	Female
1	Japan	82.73	79.29	86.96
2	Switzerland	81.81	79.31	84.12
3	Hong Kong (China)	81.61	79.04	84.30
4	Australia	81.44	79.12	84
5	Italy	81.37	78.58	83.98
6	Iceland	81.28	79.49	83.05
7	France (metropol.)	81	77.48	84.32
8	Sweden	80.88	78.78	82.93
9	Spain	80.75	77.5	84
10	Israel	80.69	78.36	82.87
11	Singapore	80.60	78.5	83
12	Canada	80.50	78.5	83
13	Norway	80.45	78.12	83
14	Austria	80.24	77.41	82.88
15	Netherlands	80.20	78.5	82.19
16	New Zealand	80.13	78.03	82.16
17	Martinique (France)	80.07	76.68	83.16
18	Macau (China)	80.03	77.74	82.57
19	South Korea	80.00	76.48	83.25
20	Germany	79.85	77.20	82.39
21	Belgium	79.77	76.95	82.50
22	Ireland	79.68	77.33	82.02
23	United Kingdom	79.53	77.38	81.68
24	Greece	79.52	77.02	82.01


1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2009
2010-2014
Shaded
Points
China
Rep. of Korea
Japan
Pakistan
India
Bangladesh
Myanmar
Thailand
Cambodia
Philippines
Guam (US)
Palau
Federated States of Micronesia
Marshall Islands
Nauru
Sri Lanka
Maldives
Malaysia
Singapore
Indonesia
Timor-Leste
Papua New Guinea
Solomon Islands
Population ages 65 and above (% of total)
0%
25%
1980-1984
1985-1989
1990-1994
1995-1999
2000-2004
2005-2009
2010-2014

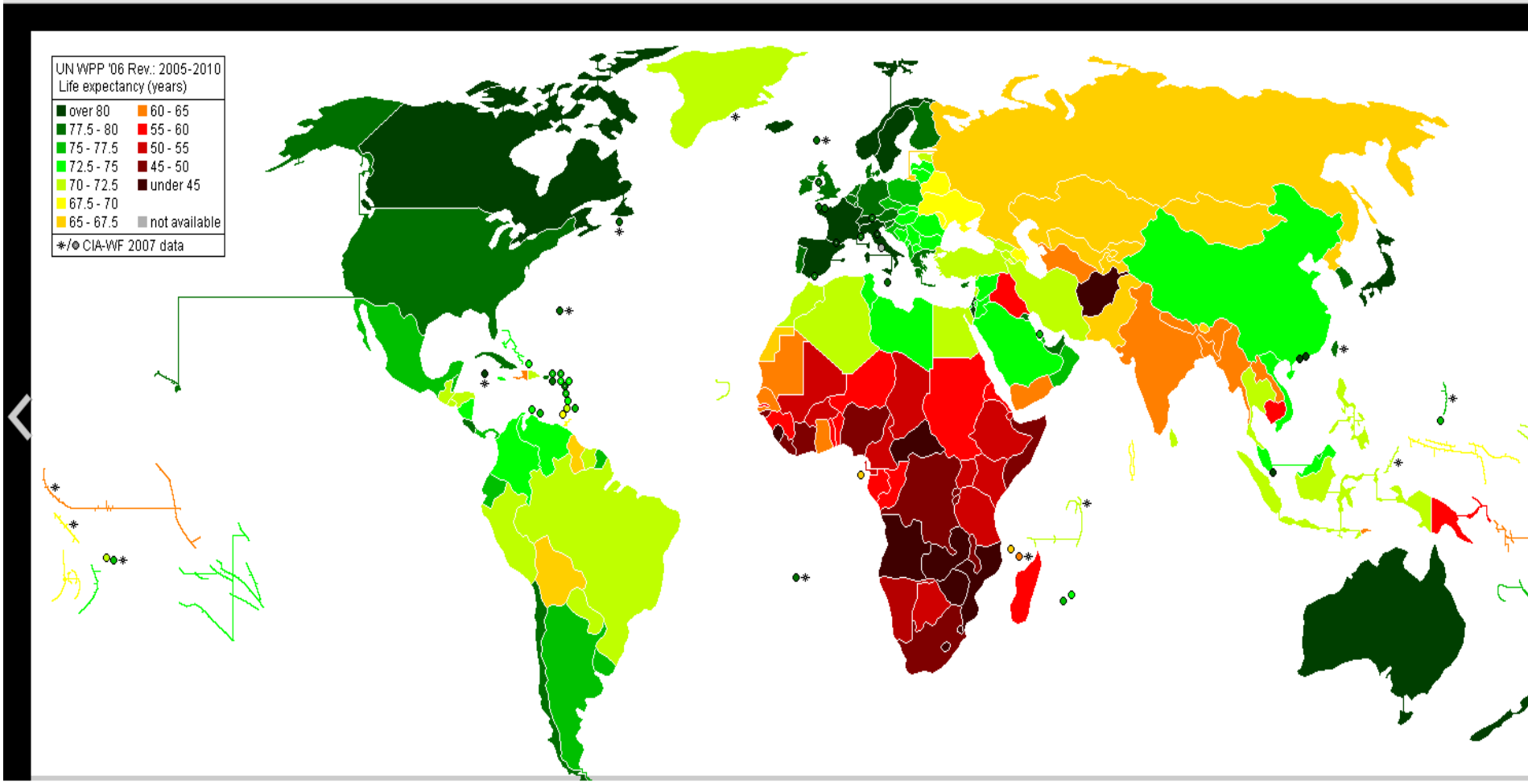
The View from Age 117 !

Born In 1898: World's Oldest Living Person Celebrates Birthday

1 min read • 9 hours ago

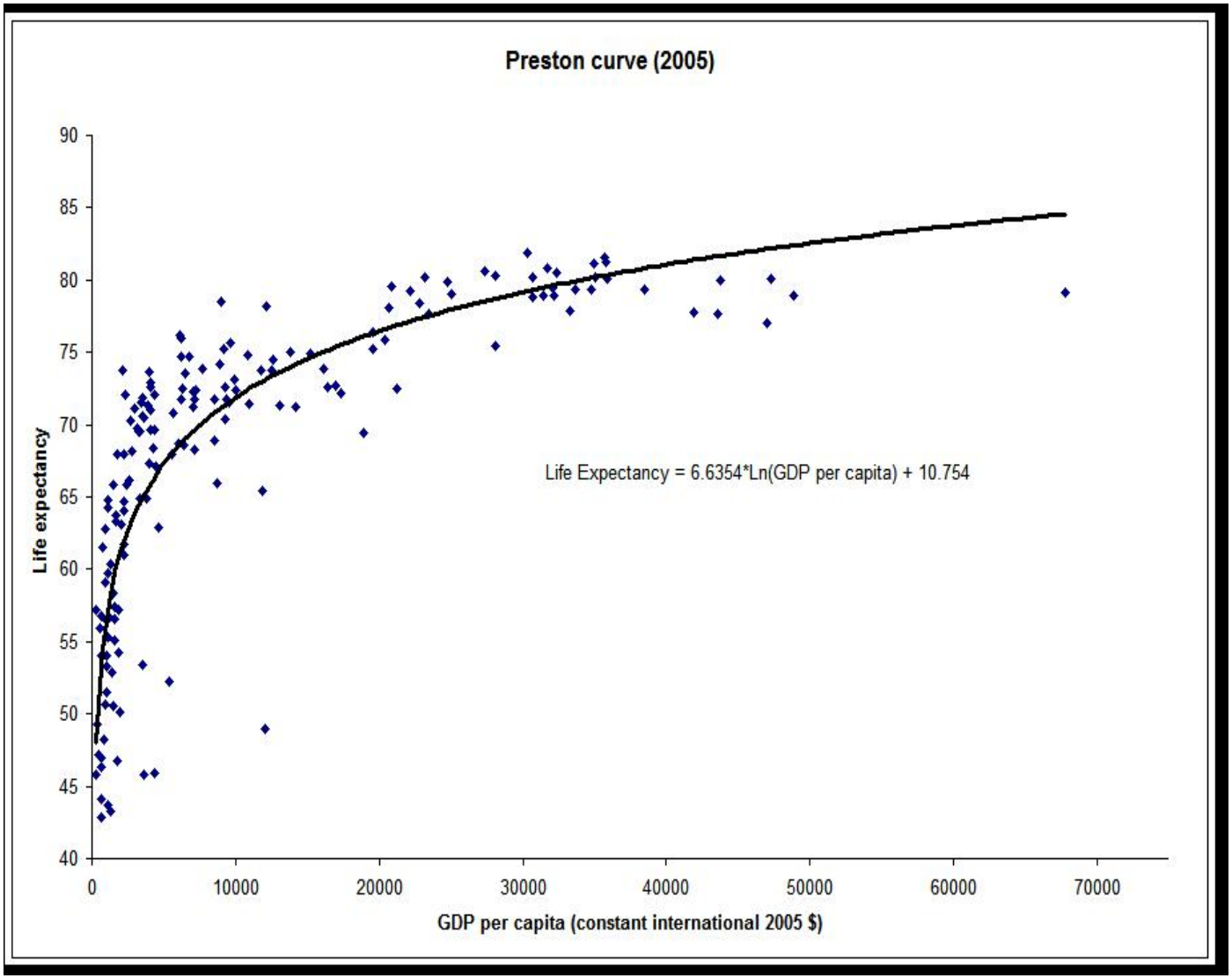
npr.org / Bill Chappell It's now past midnight in Japan, meaning that Misao Okawa, the world's oldest human being, has officially turned 117. She was born on March 5, 1898, and... read more

Côte d'Ivoire	53.02	52.14	54.05
Guinea	52.44	50.93	54.01
Uganda	52.24	51.68	52.73
Malawi	51.55	51.51	51.48
South Africa	51.20	50.13	52.08
Nigeria	50.26	49.50	51.03
Somalia	50.24	48.71	51.79
Equatorial Guinea	50.10	48.87	51.48
Mali	49.99	48.89	50.99
Cameroon	49.97	49.02	50.89
Angola	49.62	48.21	51.04
Burundi	48.81	47.48	50.05
Mozambique	48.77	47.56	49.88
Chad	48.52	47.15	49.90
Democratic Republic of the Congo	47.42	45.93	48.91
Swaziland	47.36	47.56	47.04
Afghanistan	47.32	47.19	47.47
Zambia	46.93	46.49	47.26
Guinea-Bissau	46.76	45.33	48.22
Zimbabwe	46.59	47.45	45.43
Sierra Leone	46.26	45.65	46.88
Lesotho	46.02	46.46	45.18
Central African Republic	45.91	44.47	47.31



UN World Population Prospects - The 2006 Revision: 2005-2010 Life Expectancy at birth (years). over 80 77.5-80.0 75.0-77.5 72.5-75.0 70.0-72.5 67.5-70.0 65.0-67.5 60-65 55-60 50-55 45-50 under 45 not available

More


Preston curve (2005)
Life expectancy
90
85
80
75
70
65
60
55
50
45
40
Life Expectancy = 6.6354*Ln(GDP per capita) + 10.754
0
10000
20000
30000
40000
50000
60000
70000
GDP per capita (constant international 2005 $)

Life Expectancy in Lower-Income Countries (in years)

	Men	Women
South Africa:	59	63
Nigeria:	52	54
Mali:	50	53
Somalia:	48	52
Sierra Leone:	37	39

Health Care as A Human Right

- Health is a state of complete physical, mental and social wellbeing. It is not merely the absence of disease or infirmity. Health is a fundamental human right. The attainment of the highest possible level of health is a world-wide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector.

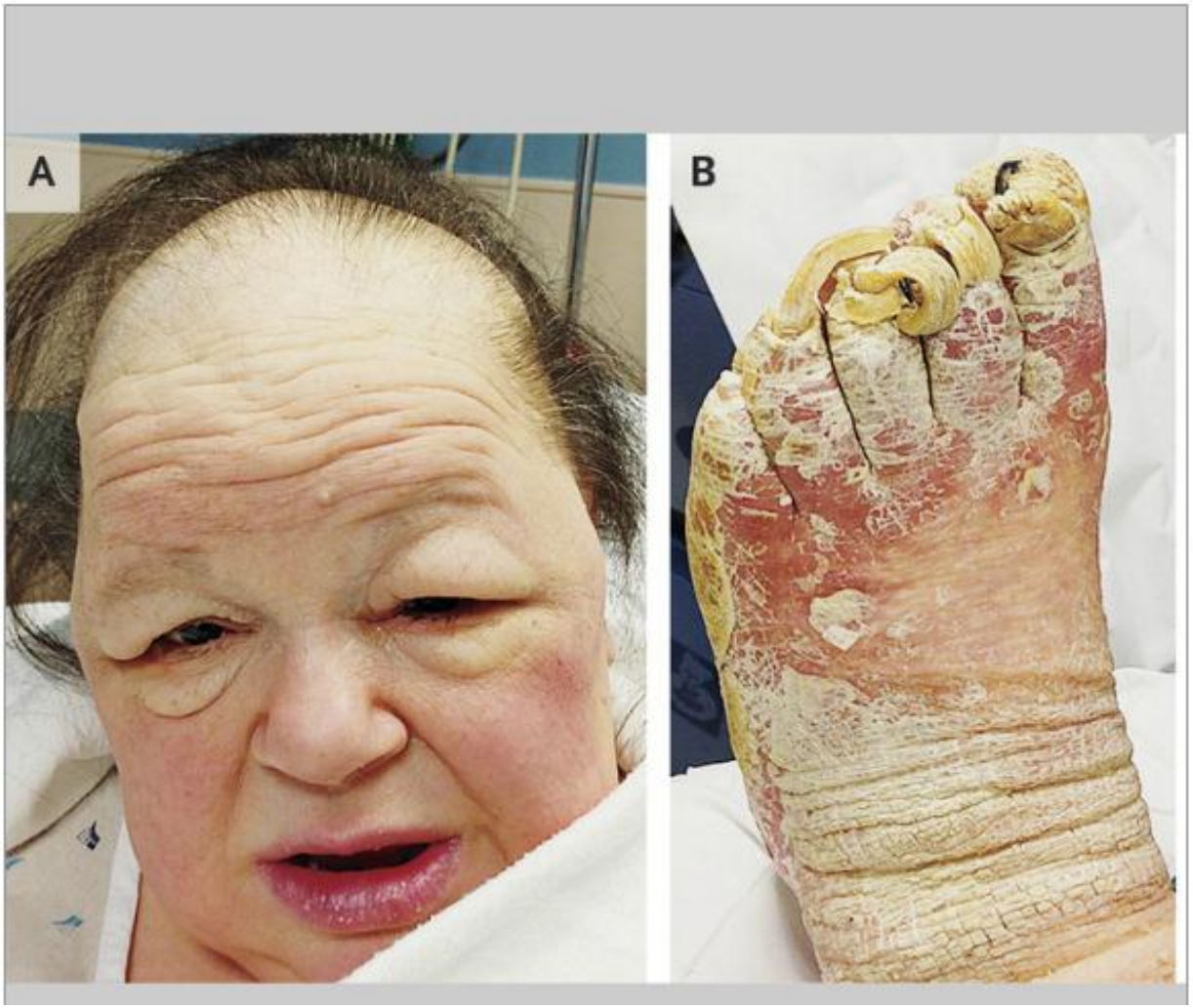
- Governments have a responsibility for the health of their people.

Health Care as A Human Right

- The gross inequality in the health status of the people both between developed and developing countries and within countries is politically, socially and economically unacceptable.
- Economic and social development is of basic importance to the attainment of health for all.
- Primary health care is essential health care. It should be made universally accessible at a cost that the community and country can afford.

» From the Alma Ata Declaration, 1978

Stupor, Hypothermia, Myopathy, and No Medical Care



One Month Later – with Appropriate Medical Care

IMAGES IN CLINICAL MEDICINE

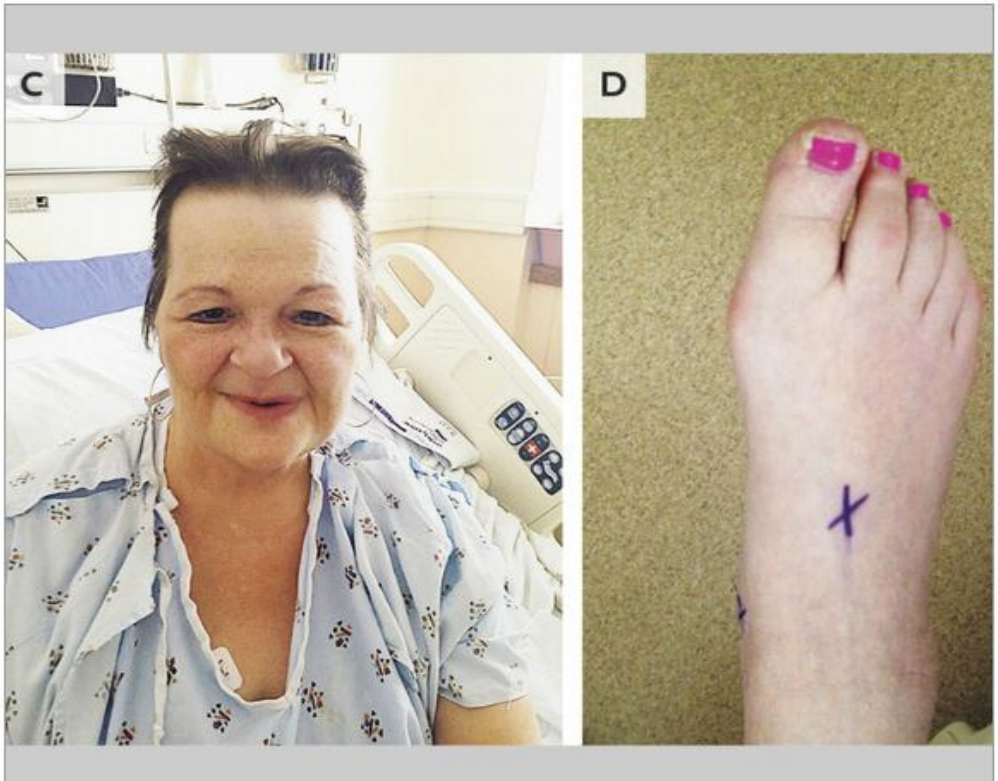
Myxedema

Joyce Kim, M.D.

N Engl J Med 2015; 372:764 | February 19, 2015 | DOI: 10.1056/NEJMicm1403210

Article

Slide



PROCÈS BETTENCOURT

LA MILLIARDAIRE ÉTAIT "UN ZOMBIE", AFFIRMENT DES EMPLOYÉS

L'ORÉAL PARIS

CLINICAL PRACTICE

Caren G. Solomon, M.D., M.P.H., Editor

Depression in the Elderly

Warren D. Taylor, M.D., M.H.Sc.

N Engl J Med 2014; 371:1228-1236 | September 25, 2014 | DOI: 10.1056/NEJMcp1402180

This *Journal* feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.

A 74-year-old woman with hypertension that is well controlled with hydrochlorothiazide is brought by her daughter for an evaluation. The daughter states that her mother is withdrawn, often tearful, and at times appears to have memory problems but has no history of psychiatric illness. The patient is a retired teacher who is widowed and has lived independently for several years. During the last few months, she has stopped going to church and visiting friends. The patient's symptoms include irritability, anhedonia, fatigue, a 4.5-kg

IMAGES IN CLINICAL MEDICINE

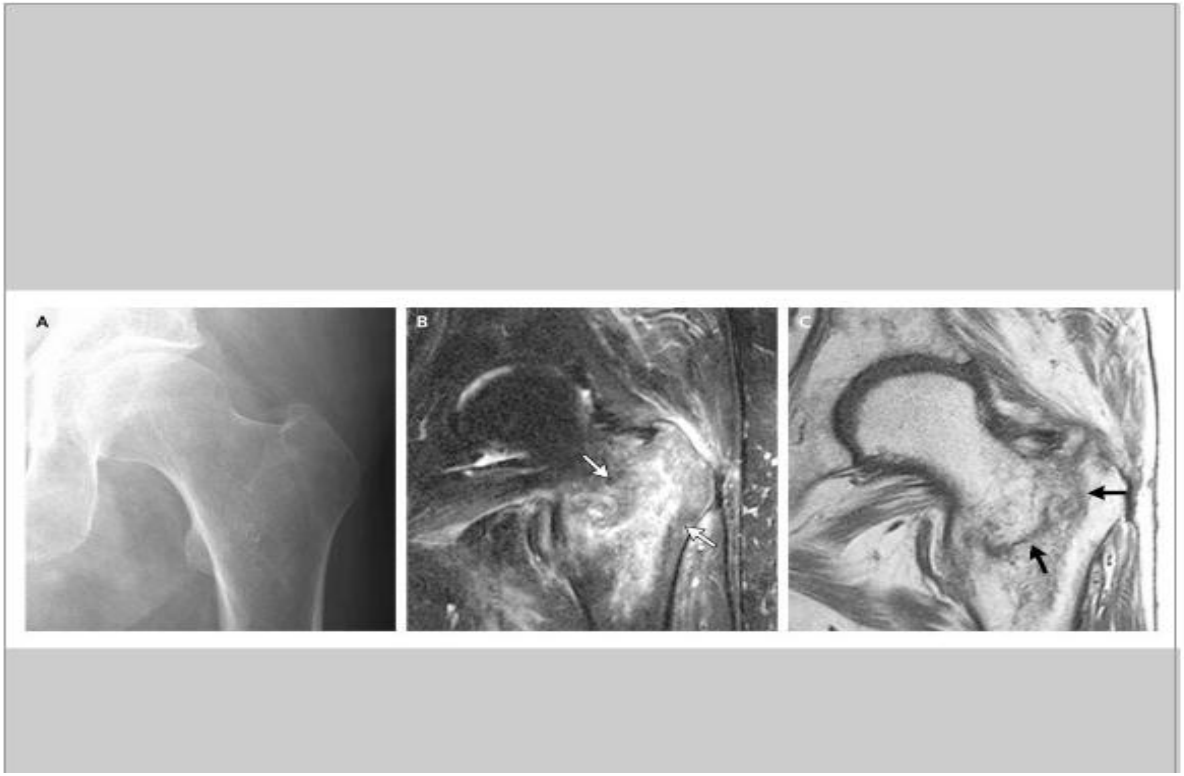
Occult Hip Fracture

Emily N. Vinson, M.D.

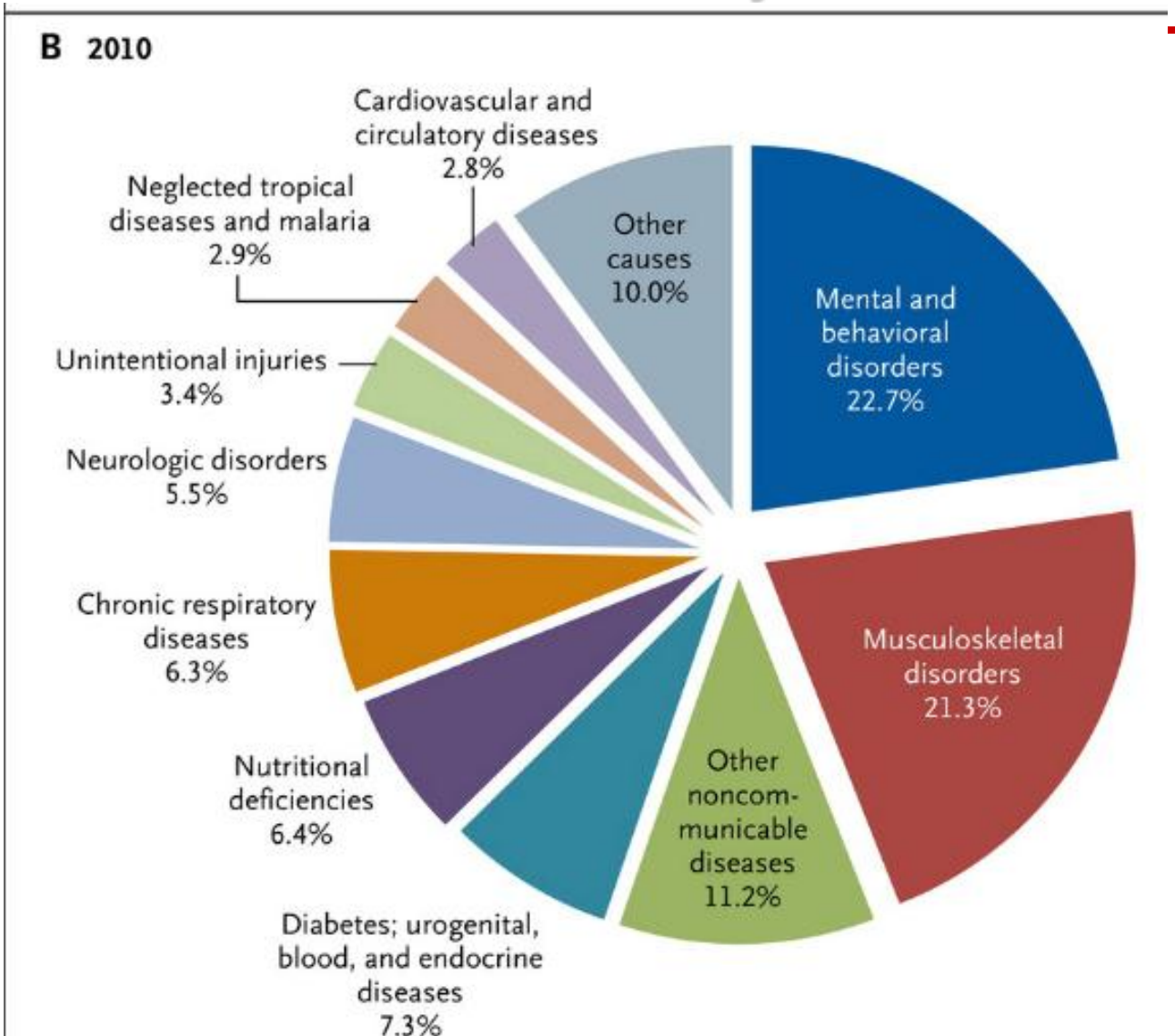
N Engl J Med 2008; 359:e33 | December 25, 2008 | DOI: 10.1056/NEJMicm0707701

Sha

Article | Citing Articles (1)



Global Burden of Years Lived with Disability



Population 65 Years and Over in Nursing Homes by Age

Age	Percent of age group			2010
	1990	2000	**2010**	
65 years and over	5.1%	4.5%	**3.1%**	1,252,635
65 to 74 years	1.4	1.1	**0.9**	197,310
75 to 84 years	6.1	4.7	**3.2**	420,790
85 years and over	24.5	18.2	**10.4**	529,689

Dementia: The Silent Epidemic

Perspective

New Insights into the Dementia Epidemic

Eric B. Larson, M.D., M.P.H., Kristine Yaffe, M.D., and Kenneth M. Langa, M.D., Ph.D.

N Engl J Med 2013; 369:2275-2277 | December 12, 2013 | DOI: 10.1056/NEJMp1311405

Described in the early 1980s as "The Silent Epidemic," dementia in the elderly will soon become a clarion call for public health experts worldwide. The epidemic is largely explained by the prevalence of dementia in persons 80 years of age or older. In most countries around the world, especially wealthy ones, this "old old" population will continue to grow, and since it accounts for the largest proportion of dementia cases, the dementia epidemic will grow worldwide. The combined effects of longer lives and the dramatic bulge of baby boomers reaching old age will magnify the epidemic in future decades.

Although demographics will drive an increase in the number of dementia cases, recent reports — generally based on

Audio Interview

Interview with Dr. Eric Larson on ne insights into the dementia epidemi (14:37)

The Dementias

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CLINICAL PRACTICE

A Correction Has Been Published

Early Alzheimer's Disease

Richard Mayeux, M.D.

N Engl J Med 2010; 362:2194-2201 | June 10, 2010 | DOI: 10.1056/NEJMcp0910236

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This *Journal* feature begins with a case vignette highlighting a common clinical problem. Evidence supporting various strategies is then presented, followed by a review of formal guidelines, when they exist. The article ends with the author's clinical recommendations.

A 72-year-old man who is still managing investments at a brokerage firm seeks consultation at the urging of his wife for increasing difficulty with memory over the past 2 years. Clients have expressed concern about his occasional lapses in memory. His wife reports that he frequently repeats questions about social appointments and becomes angry when she points this out. The physical examination is normal, but the patient has difficulty remembering elements of a brief story and adding a small amount of change. He has a score of 28 out of 30 on the Mini–Mental State Examination, indicating slightly impaired cognitive function.[1] Early Alzheimer's disease is suspected. How should the patient be further evaluated and treated?

THE CLINICAL PROBLEM

Alzheimer's disease is the most frequent cause of dementia in Western societies, affecting an estimated 5 million people in the United States and 17 million worldwide.[2] The annual incidence worldwide increases from 1% between the ages of 60 and 70

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Early Alzheimer's Disease
October 28, 2010

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Early Alzheimer's Disease
September 16, 2010

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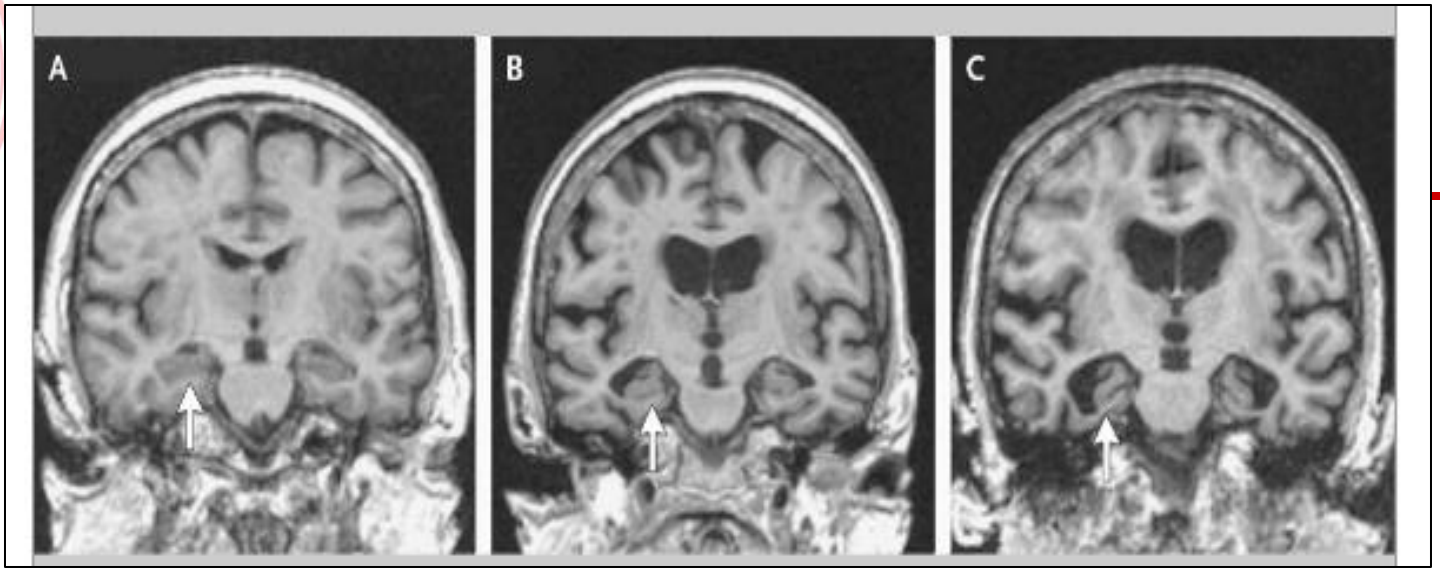
Review
June 1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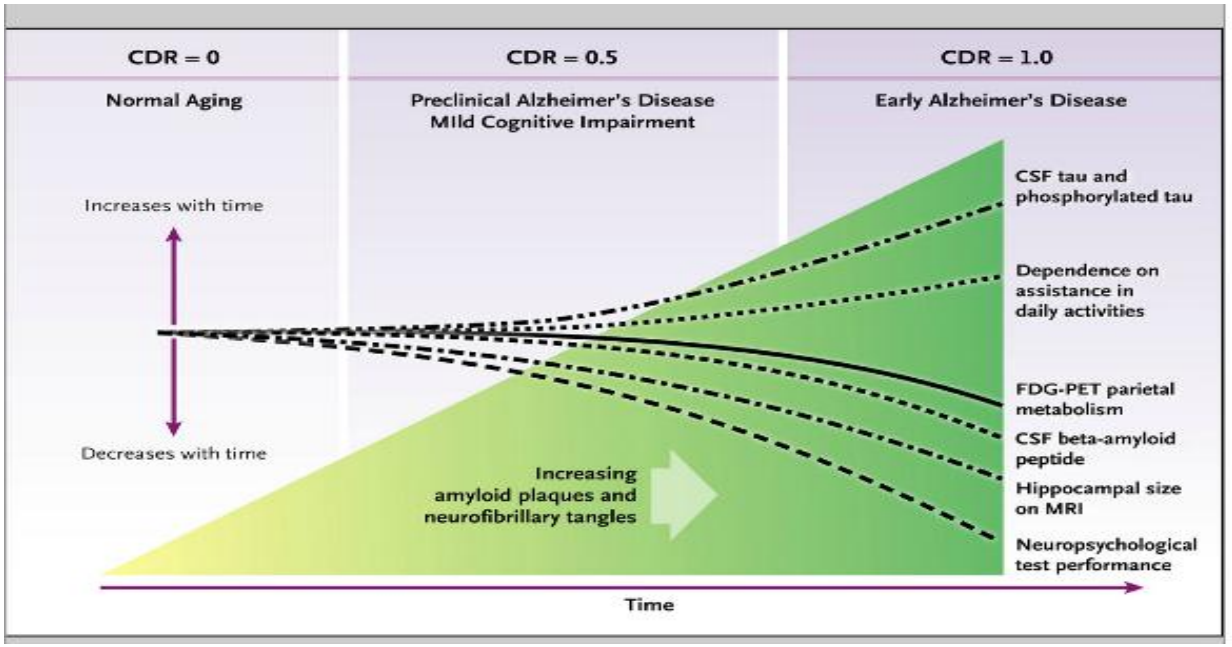
CDR = 0
Normal Aging
CDR = 0.5
Preclinical Alzheimer's Disease
MIld Cognitive Impairment
CDR = 1.0
Early Alzheimer's Disease
Increases with time
Decreases with time
CSF tau and phosphorylated tau
Dependence on assistance in daily activities
FDG-PET parietal metabolism
CSF beta-amyloid peptide
Hippocampal size on MRI
Neuropsychological test performance
Increasing amyloid plaques and neurofibrillary tangles
Time

Dementia, Delirium, and Depression

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Richard C. Cabot, Founder, Eric S. Rosenberg, M.D., Editor, Nancy Lee Harris, M.D., Editor, Jo-Anne O. Shepard, M.D., Associate Editor, Alice M. Cort, M.D., Associate Editor, Sally H. Ebeling, Assistant Editor, Emily K. McDonald, Assistant Editor

Case 38-2014 — An 87-Year-Old Man with Sore Throat, Hoarseness, Fatigue, and Dyspnea

Christiana A. Iyasere, M.D., Leigh H. Simmons, M.D., Florian J. Fintelmann, M.D., and Anand S. Dighe, M.D.

N Engl J Med 2014; 371:2321-2327 | December 11, 2014 | DOI: 10.1056/NEJMcpc1410935

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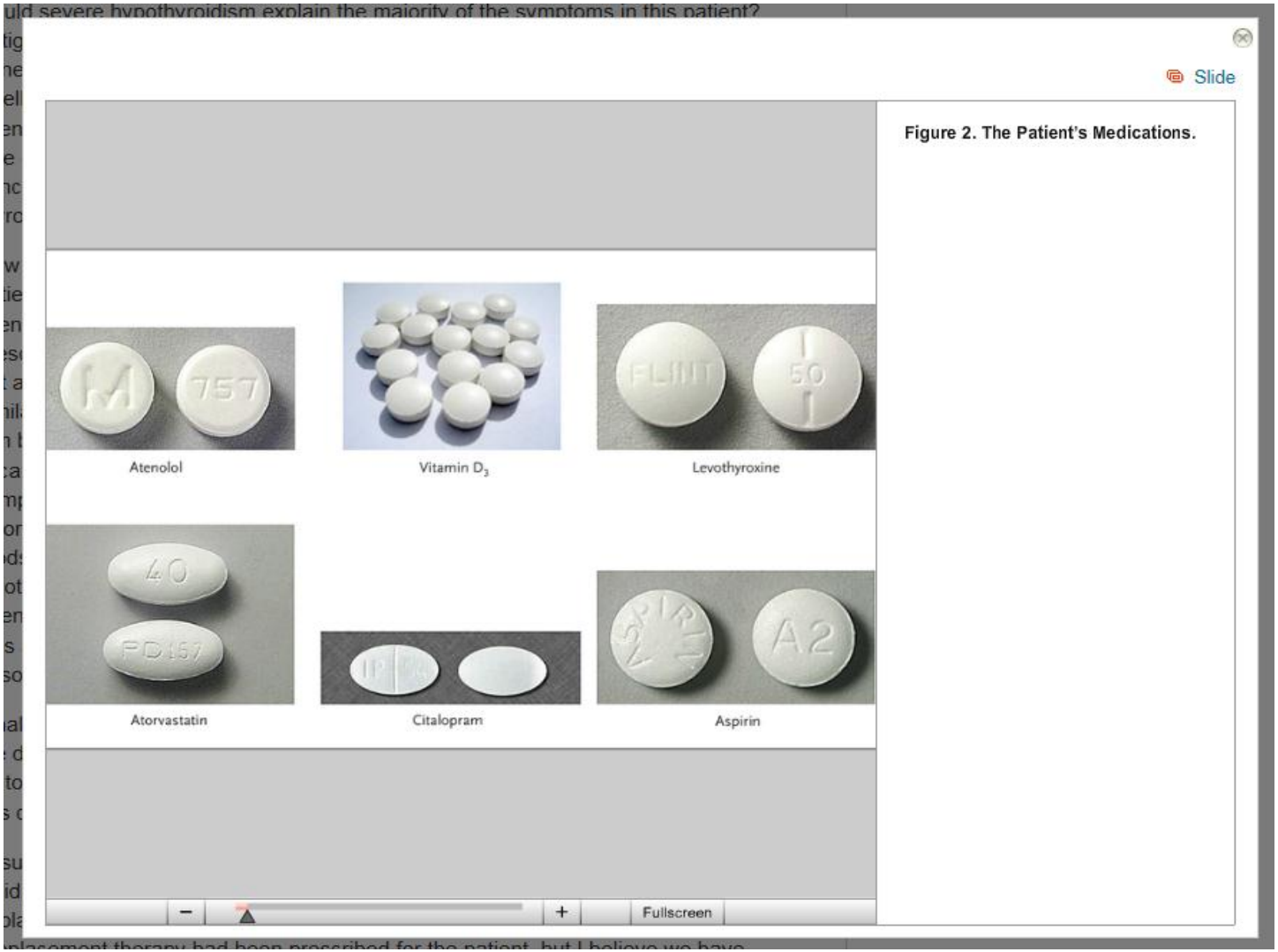
PRESENTATION OF CASE

Dr. Leigh H. Simmons: An 87-year-old man with multiple chronic medical problems was seen in an outpatient clinic of this hospital because of sore throat and fatigue.

The patient had been in his usual health until several weeks before presentation, when hoarseness, sore throat, and increasing fatigue developed. At the urging of his family, he was seen by his physician in an outpatient clinic of this hospital. He reported hoarseness, increasing facial puffiness, and periorbital swelling, with no chest pain, dyspnea, or new joint pains or muscle aches.

The patient had hypertension, hyperlipidemia, and chronic kidney disease. Two

Dementia, Delirium, and Depression



ORIGINAL ARTICLE

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

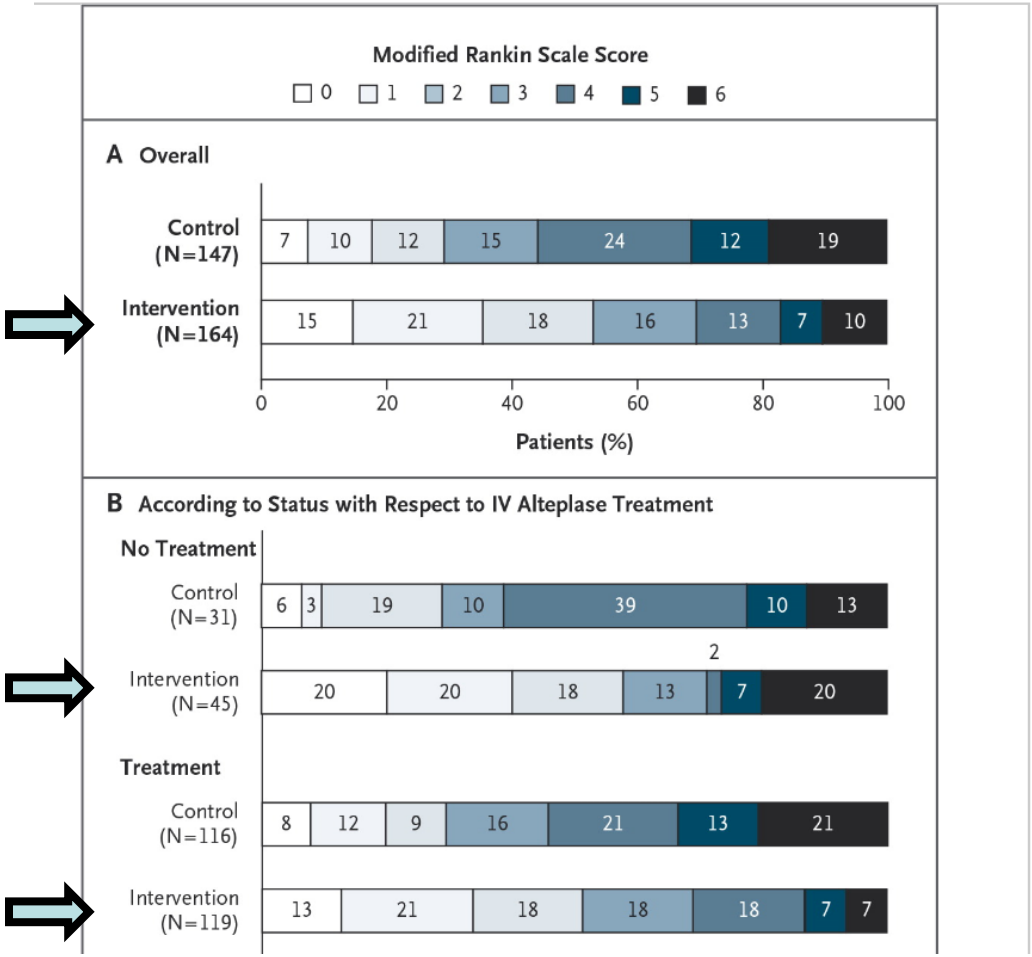


Figure 1. Scores on the Modified Rankin Scale at 90 Days in the Intention-to-Treat Population.

Scores on the modified Rankin scale range from 0 to 6, with 0 indicating no symptoms, 1 no clinically significant disability, 2 slight disability, 3 moderate disability, 4 moderately severe disability, 5 severe disability, and 6 death. Panel A shows the distribution of scores at 90 days in the intervention and control groups in the overall trial population. A significant difference between the intervention and control groups was noted in the overall distribution of scores (unadjusted common odds ratio, indicating the odds of improvement of 1 point on the modified Rankin scale, 2.6; 95% confidence interval, 1.7 to 3.8), favoring the intervention. Panel B shows the distribution of scores at 90 days in the intervention and control groups

Hi-Technology Modern Medical Interventions

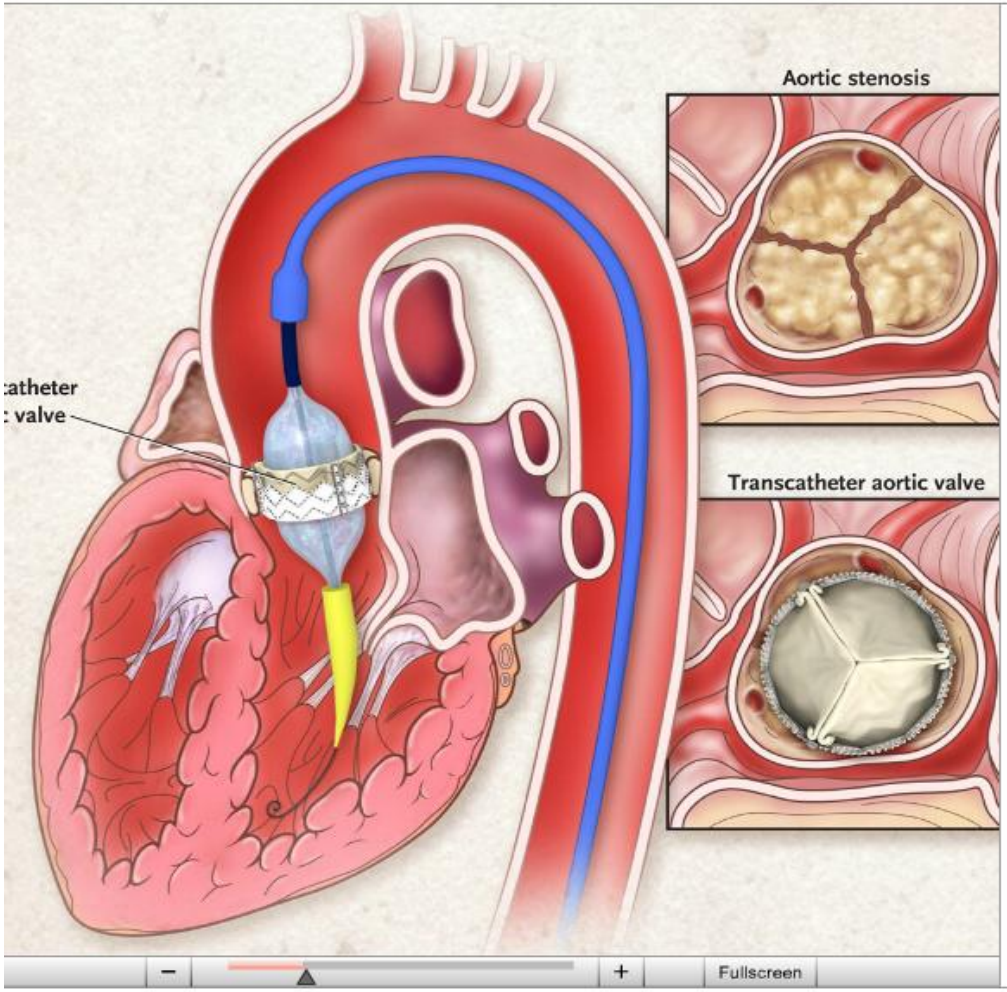
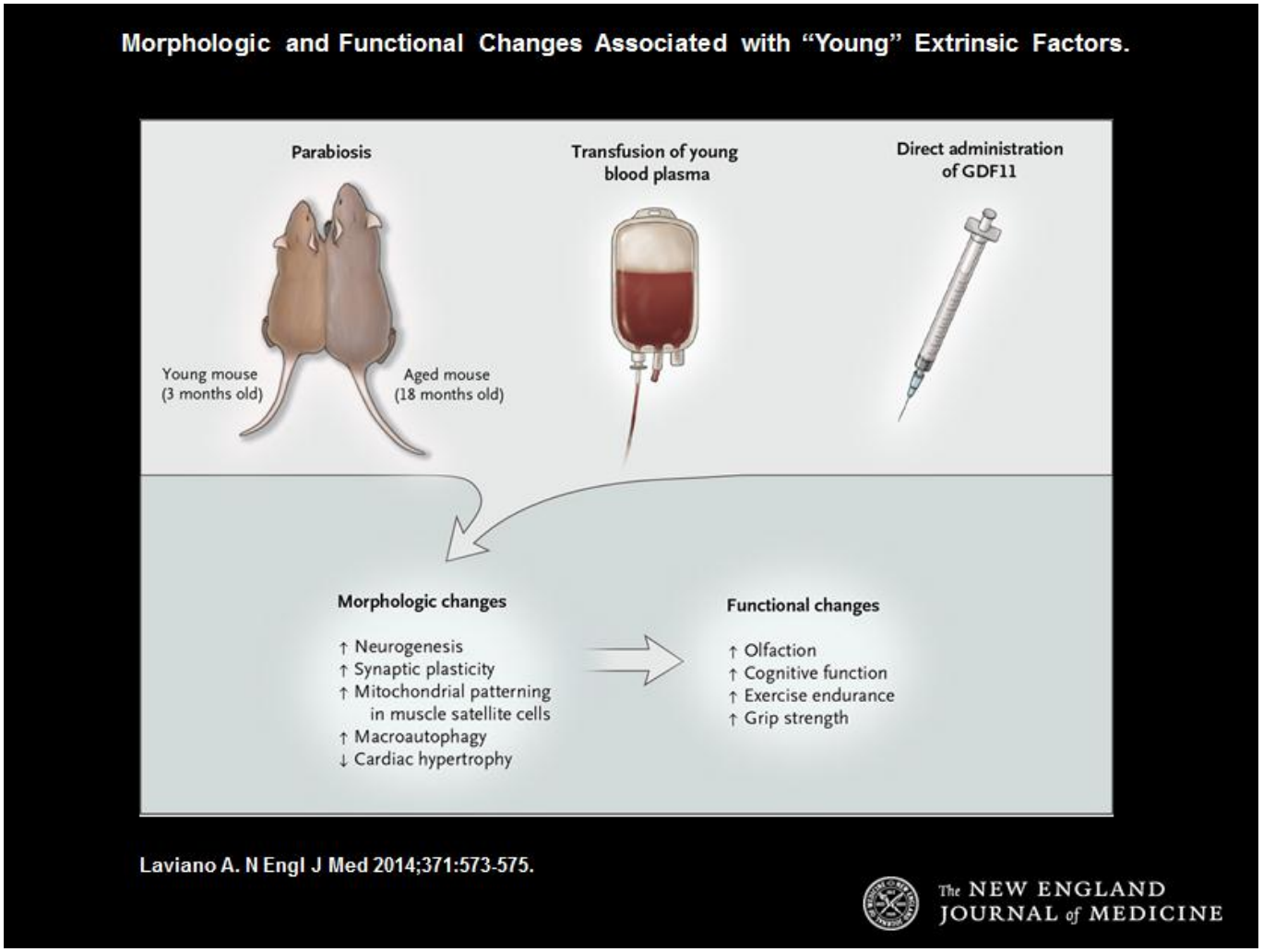


Figure 1. Transcatheter Aortic-Valve Replacement.

The transcatheter valve is positioned at the level of the native aortic valve during the final step of valve replacement, when the balloon is inflated within the native valve during a brief period of rapid ventricular pacing. The delivery system is shown after it has traversed the aorta retrograde over a guidewire from its point of insertion in the femoral artery (transfemoral placement). Before balloon inflation, the valve and balloon are collapsed on the catheter (dark blue) and fit within the sheath (blue). After balloon inflation, the calcified native valve (upper panel) is replaced by the expanded transcatheter valve (lower panel, shown in short-axis view from the aortic side of the valve).

The Need for Research on Aging



8 Priority Areas for Prevention

- Drug-induced complications
- Depression
- Stroke prevention
- Avoiding iatrogenic illness
- Home care over rather than hospitalization
- Hearing and visual disorders
- Safer, more functional home environments
- Prevention of falls/fractures

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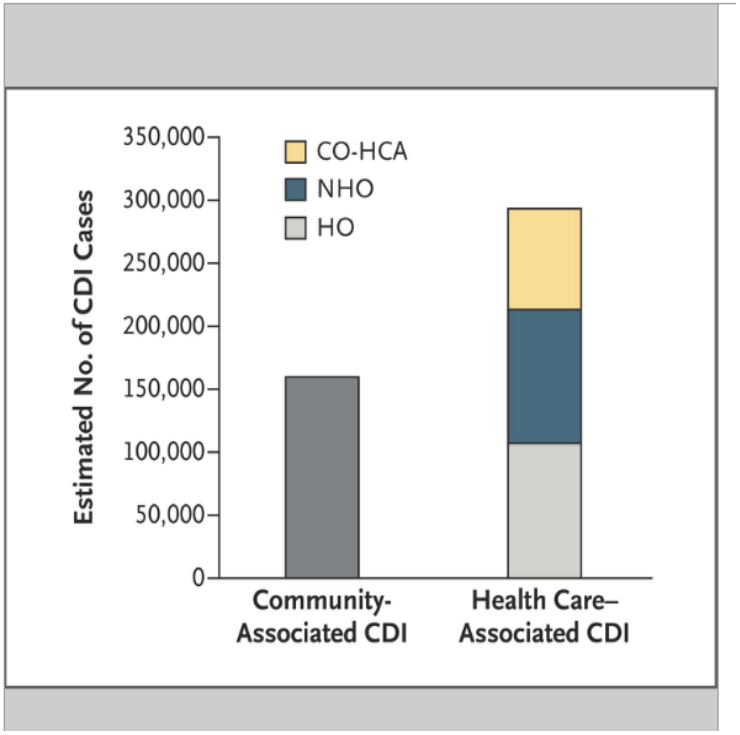
ORIGINAL ARTICLE

Burden of *Clostridium difficile* Infection in the United States



Iatrogenic Disease

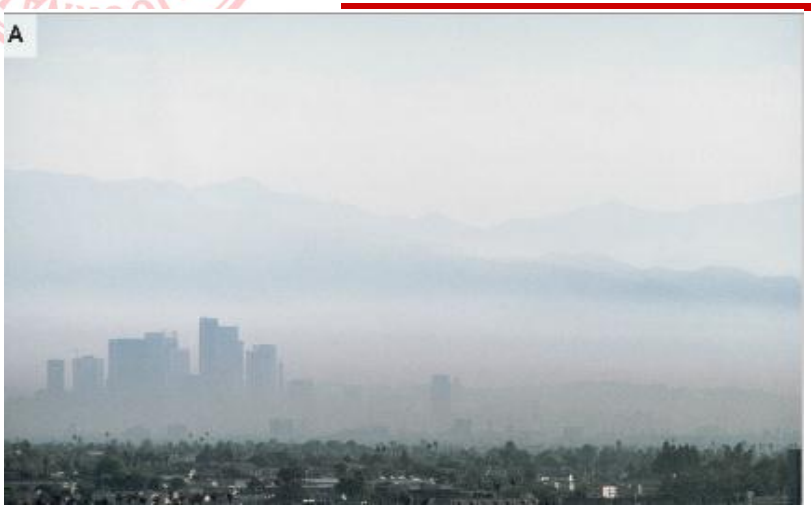
Table 3. Adjusted U.S. National Estimates of Recurrences and Deaths Associated with CDI, According to Epidemiologic Category, 2011.*

Characteristic	Estimated Recurrences		Recurrence Rate		Estimated Deaths		Death Rate	
	CA CDI	HCA CDI	CA CDI	HCA CDI	CA CDI	HCA CDI	CA CDI	HCA CDI
	no. (95% CI)		*no. per 100,000 persons (95% CI)*		*no. (95% CI)*		*no. per 100,000 persons (95% CI)*	
All cases	21,600 (16,900–26,300)	61,400 (40,200–82,600)	7.0 (5.5–8.6)	19.9 (13.0–26.9)	2000 (1200–2800)	27,300 (15,300–39,300)	0.7 (0.4–0.9)	8.9 (5.0–12.8)
Sex								
Male	7800 (5100–10,500)	27,300 (12,800–41,800)	5.2 (3.4–6.9)	18.0 (8.5–27.6)	900 (450–1350)	12,300 (3800–20,700)	0.6 (0.3–0.9)	8.1 (2.5–13.7)
Female	13,800 (9900–17,600)	34,000 (18,700–49,400)	8.8 (6.3–11.3)	21.7 (12.0–31.6)	1100 (400–1700)	15,000 (6600–23,500)	0.7 (0.3–1.1)	9.6 (4.2–15.0)
Age group								
1–17 yr	1400 (900–1900)	300 (100–500)	2.0 (1.3–2.7)	0.4 (0.1–0.7)	NA	NA	NA	NA
18–44 yr	2600 (1300–3900)	3400 (1000–5700)	2.3 (1.1–3.4)	3.0 (0.9–5.0)	50 (0–120)	NA	<0.1 (0–0.1)	NA
45–64 yr	6200 (4000–8300)	9000 (4400–13,700)	7.5 (4.8–10.0)	10.9 (5.3–16.6)	420 (120–720)	4500 (1020–8000)	0.5 (0.1–0.9)	5.4 (1.2–9.7)
≥65 yr	11,400 (7400–15,400)	48,700 (28,100–69,200)	27.5 (17.9–37.2)	117.6 (67.9–167.2)	1500 (750–2200)	22,800 (11,300–34,200)	3.6 (1.8–5.3)	55.1 (27.3–82.6)
Race								
White	19,600 (14,900–24,200)	54,900 (34,000–75,700)	8.1 (6.2–10.1)	22.8 (14.1–31.5)	1800 (980–2600)	25,700 (13,900–37,600)	0.8 (0.4–1.1)	10.7 (5.8–15.6)
Nonwhite	2000 (900–3200)	6500 (400–12,600)	3.0 (1.3–4.8)	9.7 (0.6–18.8)	200 (0–390)	1600 (0–3500)	0.3 (0.0–0.6)	2.4 (0.0–5.2)

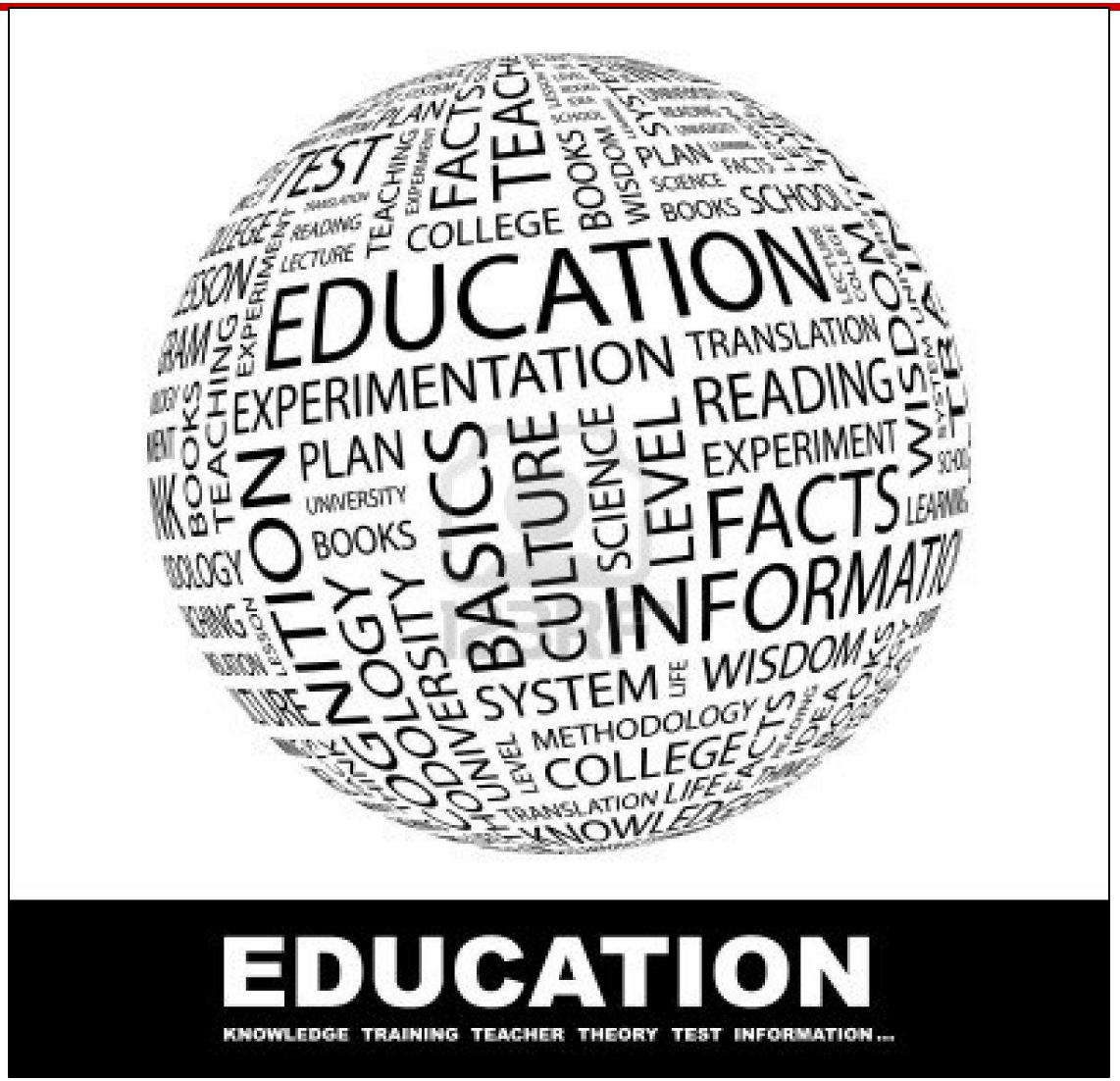
The Challenges of Aging: 4 Strategies for Success

- Focus on Home and Community, not Hospital
- Interdisciplinary Team Care
- Exercise, Exercise…and Rehabilitation
- Focus on Function

Challenges in the Community and in the Environment



The Essential, but Unappreciated, Strategy for Health



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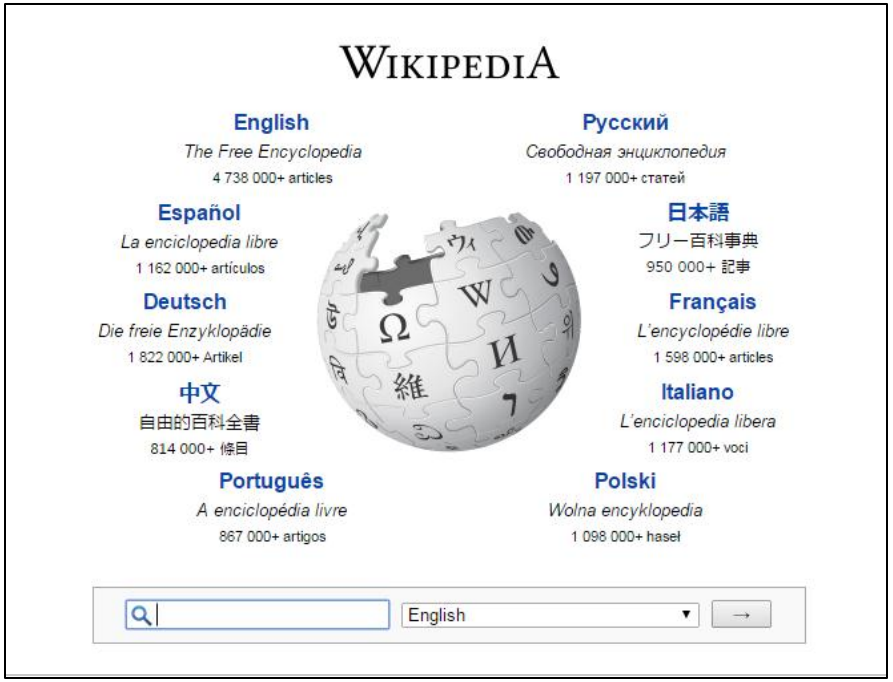

ORIGINAL ARTICLE

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N Engl J Med 2010; 363:733-742

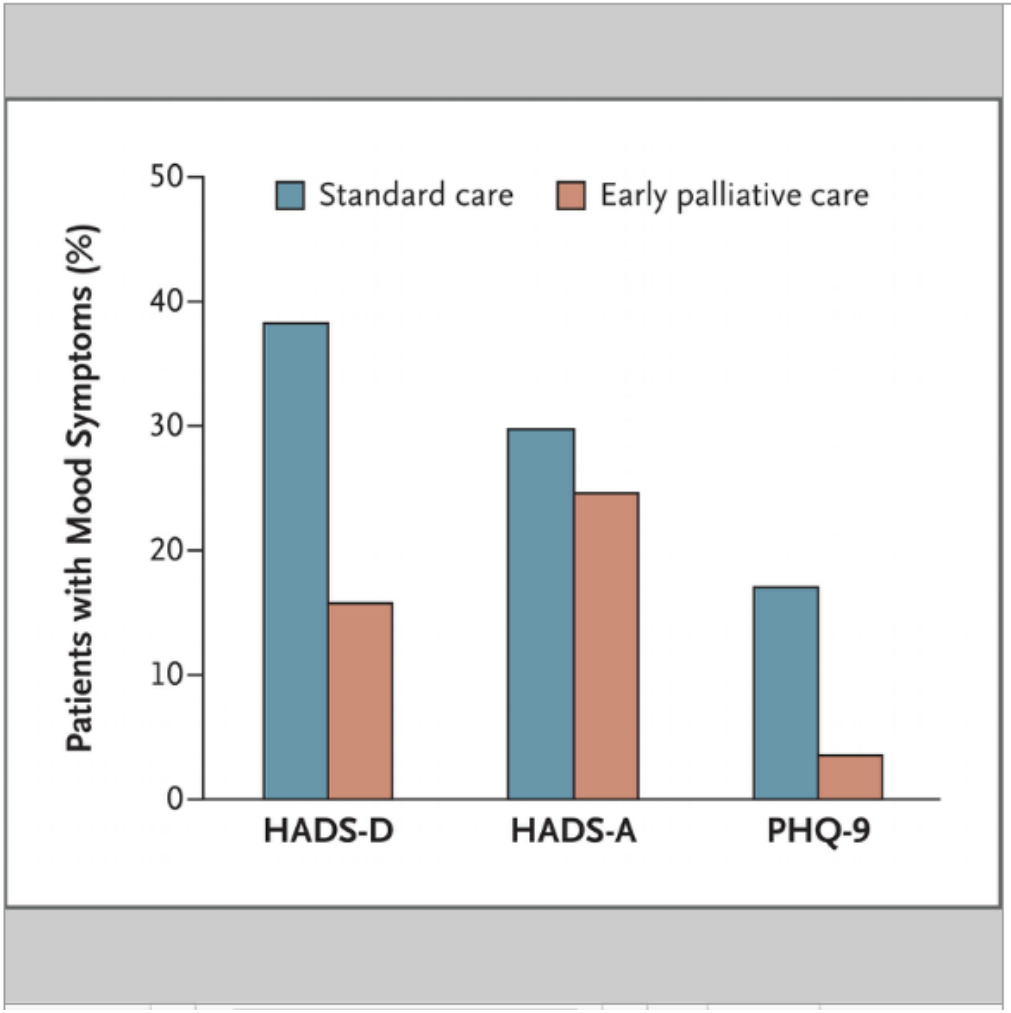

Figure 2. Twelve-Week Outcomes of Assessments of Mood.

Depressive symptoms were assessed with the use of the Hospital Anxiety and Depression Scale (HADS), which consists of two subscales, one for symptoms of anxiety (HADS-A) and one for symptoms of depression (HADS-D) (subscale scores range from 0, indicating no distress, to 21, indicating maximum distress; a score higher than 7 on either HADS subscale is considered to be clinically significant) and with the use of the Patient Health Questionnaire 9 (PHQ-9). The PHQ-9 is a nine-item measure that evaluates symptoms of major depressive disorder according to the criteria of the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). A major depressive syndrome was diagnosed if a patient reported at least five of the nine symptoms of depression on the PHQ-9, with one of the five symptoms being either anhedonia or depressed mood. Symptoms had to be present for more than half the time, except for the symptom of suicidal thoughts, which was included in the diagnosis if it was present at any time. The percentages of patients with mood symptoms, assessed on the basis of each of these measures, in the group assigned to standard treatment and the group assigned to early palliative care, respectively, are as follows: HADS-D, 38% (18 of 47 patients) versus 16% (9 of 57), P=0.01; HADS-A, 30% (14 of 47 patients) and 25% (14 of 57), respectively; P=0.66; and PHQ-9, 17% (8 of 47 patients) versus

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CASE VIGNETTE

Anne is a 59-year-old woman who is weighing her future and wondering whether she'll see her granddaughter grow up. She has breast cancer, and so far her treatments haven't beaten the disease or prevented its spread. She completed an advance directive when she was 50 years old, after her parents' unexpected deaths from lung cancer and a stroke and years before her diagnosis of breast cancer. Her mother spent a short time in hospice and her father's stroke was fatal within 24 hours.

When she completed her advance directive 9 years ago, she indicated that her sister Betty would have her power of attorney for health care and that if she were terminally ill she would not want to be intubated. She returns to see you as her primary care physician. You've taken care of her for 3 years but have seen her only three times, since the oncology team has coordinated most of her care.

She initially received a diagnosis of localized estrogen-receptor–negative, progesterone-receptor–

The Challenge: Our Future

Our work for the advanced years is handicapped by our clinging to the dogmatic belief in the immutability of man…of old age as stage of stagnation.

The years of old age may enable us to attain the high values we failed to sense, the insights we have missed, the wisdom we ignored. They are years rich in possibilities to deepen understanding and compassion, to widen the horizon of honesty, and to refine the sense of fairness.

» Abraham Heschel

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Thank You.

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Executive Editor
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