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In Reply: We concur with Dr Sekhon's view that resolving the coach/judge dilemma in medical education will require a shift in how evaluations are viewed by both supervisor and trainee. Sekhon proposes that this be accomplished through faculty development and modifying evaluation criteria to foster lifelong learning. We agree. Doing so will require a better understanding of how clinical tutors assess the clinical performance of trainees. Recent literature suggests that ratings of clinical performance by tutors are complex and more subject to bias than previously thought.[1,2] Minimizing this bias is a challenging if not impossible task. This issue could be circumvented by reframing interactions between clinical tutors and trainees to focus on developing expertise.

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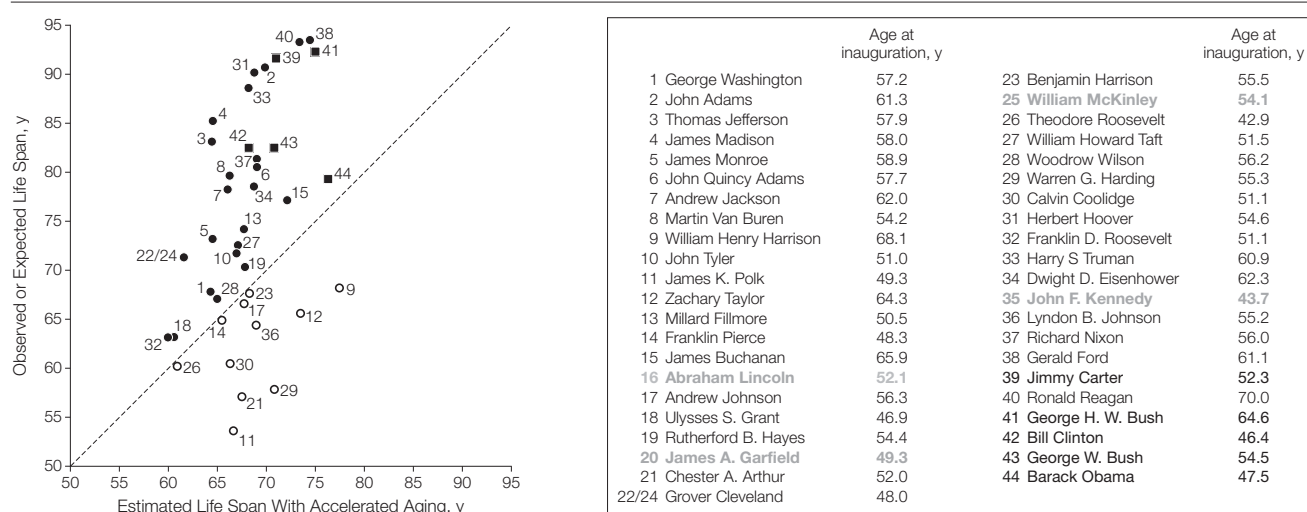
RESEARCH LETTER

Aging of US Presidents

To the Editor: There has been speculation that US presidents experience accelerated aging while in office. One physician suggested that the typical president ages 2 years for every year he is in office—a conclusion derived from medical records of presidents since the 1920s.[1] Although the rate of biological aging cannot be measured,[2] it is possible to indirectly assess claims of accelerated aging among presidents.

Methods. Ages at inauguration and death for every deceased US president are in the historical record. Life expectancies for US men the same age as presidents at inauguration in 1900 and later were obtained from Social Security Administration life tables[3] and from the Human Mortality Database (http://www.mortality.org). Estimated life spans at inauguration for presidents entering office from 1816 to 1899 were based on life tables from France from the Human Mortality Database because of their reliable mortality records during that era; the longevity of men in France and the United States during this time was likely to have been comparable, and national vital statistics for US residents were unavailable. Estimated life spans at inauguration for presidents entering office from 1789 to 1815 were based on the life table for France in 1816. For living presidents, life spans for men the same age as each president at inauguration were esti-

Figure. Estimated and Observed or Expected Life Span of US Presidents

	Age at inauguration, y		Age at inauguration, y
1 George Washington	57.2	23 Benjamin Harrison	55.5
2 John Adams	61.3	25 William McKinley	54.1
3 Thomas Jefferson	57.9	26 Theodore Roosevelt	42.9
4 James Madison	58.0	27 William Howard Taft	51.5
5 James Monroe	58.9	28 Woodrow Wilson	56.2
6 John Quincy Adams	57.7	29 Warren G. Harding	55.3
7 Andrew Jackson	62.0	30 Calvin Coolidge	51.1
8 Martin Van Buren	54.2	31 Herbert Hoover	54.6
9 William Henry Harrison	68.1	32 Franklin D. Roosevelt	51.1
10 John Tyler	51.0	33 Harry S Truman	60.9
11 James K. Polk	49.3	34 Dwight D. Eisenhower	62.3
12 Zachary Taylor	64.3	35 John F. Kennedy	43.7
13 Millard Fillmore	50.5	36 Lyndon B. Johnson	55.2
14 Franklin Pierce	48.3	37 Richard Nixon	56.0
15 James Buchanan	65.9	38 Gerald Ford	61.1
16 Abraham Lincoln	52.1	39 Jimmy Carter	52.3
17 Andrew Johnson	56.3	40 Ronald Reagan	70.0
18 Ulysses S. Grant	46.9	41 George H. W. Bush	64.6
19 Rutherford B. Hayes	54.4	42 Bill Clinton	46.4
20 James A. Garfield	49.3	43 George W. Bush	54.5
21 Chester A. Arthur	52.0	44 Barack Obama	47.5
22/24 Grover Cleveland	48.0		

The diagonal line represents an exact match between estimated life span with accelerated aging and observed or expected life span. Presidents who appear above the line lived or are expected to live longer than their estimated life span while those who appear below the line died before their estimated life span. Presidents who did not die of natural causes (Lincoln, Garfield, McKinley, and Kennedy, indicated by gray) and living presidents (Carter, G. H. W. Bush, Clinton, G. W. Bush, and Obama, indicated by bold and squares) were excluded from analyses involving observed survival because they are either still alive or did not die from natural causes. For living presidents, expected remaining years of life from their current ages were estimated from a complete life table for the total male resident US population published in 2007. Years of life hypothetically lost because of accelerated aging were calculated the same way for all presidents, living and deceased.

mated from life tables for US men in 2007 from the Human Mortality Database.

Aging twice as fast while in office was interpreted to mean that for each day in office, 2 days of life were subtracted from estimated life span at age of inauguration. Estimated life spans were compared with how long each president who died of natural causes actually lived. This study was exempted from institutional review board approval by the University of Illinois at Chicago.

Results. The mean estimated life span of men matched to the date of inauguration of all presidents was 73.3 years. Observed mean life span of 34 deceased presidents who died of natural causes was 73.0 years. Estimated mean life span of all presidents under the assumption of aging at twice the normal rate while in office was 68.1 years (including presidents still alive). Of 34 deceased presidents who died of natural causes, 23 lived longer than expected with accelerated aging, with a mean age at death of 78.0 years, while their estimated age at death (with accelerated aging) was 67.0 years (**FIGURE**). Of the 11 presidents who died earlier than expected, mean observed life span was 62.1 years while mean estimated life span was 67.8 years.

All living presidents have either already exceeded the estimated life span of all US men at their age of inauguration or are likely to do so.

Comment. This study found no evidence that US presidents die sooner, on average, than other US men. To the contrary, 23 of 34 presidents who died of natural causes lived beyond the average life expectancy for men of the same age when they were inaugurated, even if they hypothetically aged at twice the normal rate while in office. Presidents live so long for 2 reasons. Because average age at inauguration is 55.1 years, each president first had to survive the most perilous early years of life. Also, all but 10 presidents were college educated, had considerable wealth, and had access to the best medical care in their era. Level of completed education and its related social and economic status correlates

have documented powerful effects on longevity today[4] and probably had even more powerful effects centuries ago (detailed data on the effect of socioeconomic status and medical care on longevity do not exist for the US population prior to more than a few decades ago).

The graying of hair and wrinkling of skin seen in presidents while in office are normal elements of human aging; they occur for all men during this phase of life and can be accelerated by behavioral risk factors such as smoking and stress.[5,6] Whether these outward changes occur faster for presidents relative to other men of the same age is unknown. Even if these signs of aging did appear at a faster rate for presidents, this study shows that this does not mean that their lives are shortened.

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