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פרופ' יורם לבוא
מומחה לרפואה פנימית
לאימונולוגיה ואלרגיה
ולמחלות מיפרקים.

23/6/2026

חוות דעת רפואית.

הנדון: ציון אברהם ז"ל.

חוות דעת זו מתייחסת לת.א. 18026-01-26 (שלום, הרצליה)
וניתנת לבקשת עו"ד א. זאואר.

חוות דעת זו ניתנת על ידי **פרופסור יורם לבוא:**

בוגר בית הספר לרפואה של הדסה והאוניברסיטה העברית בירושלים.
פרופסור מן המניין (אמריטוס) לרפואה פנימית באוניברסיטת תל-אביב.

מנהל מחלקה פנימית בבית-חולים איכילוב, מרכז רפואי ת"א, במשך ± 30 שנים.
כיום, רופא בכיר בחטיבה הפנימית של בי"ח איכילוב.

מומחה לרפואה פנימית, לריאומטולוגיה, לאלרגיה ולאימונולוגיה.
חבר באגודות הישראליות לגסטרואנטרולוגיה, לחקר הכבד ולהמטולוגיה.

השתלמות של שנה ב- "National Jewish Health", מוסד רפואי יוקרתי (דנבר, ארה"ב)
המיתמחה במחלות ריאה מורכבות.

יו"ר הועדה לרישום תרופות במשרד הבריאות (המקבילה ל- FDA האמריקאי)
במשך כ- 20 שנים.

המיסמכים שעמדו לרשותי:

- (1) תיעוד רפואי מבתי חולים: א) שיבא, ב) וולפסון, ג) אסותא, ד) שמיר (אספ הרופא).
- (2) תיעוד רפואי, מעקב קופ"ח בקהילה.
- (3) חו"ד (מהתביעה) ד"ר ד. חזן (20/11/2025).

מבוא.

ציון אברהם ז"ל (להלן "החולה") נולד בספטמבר 1953.
"האירוע מושא התביעה" (להלן "האירוע") ניתוח לכריתת כיס מרה עם סיבוכים שהביאו
לפטירת החולה ב- 16/2/2025.

מטרת חוות דעתי להלן לדון בבעיות הבריאות של החולה שקדמו ל"אירוע" ובהשלכותיהן על תוחלת חייו במועד האירוע.

מדובר בחולה אשר סבל ממספר בעיות בריאות חמורות שכללו בין השאר עישון כבד והפרעה במטבוליזם של שומני הדם (היפר-ליפידמיה / כולסטרולמיה). בעיות אלה עם השפעה גנטית (תורשתית) ועם השפעות סביבתיות (כולל תזונה לדוגמא) גורמות בשכיח לטרשת עורקים.

טרשת עורקים (athero-sclerosis) גורמת לסתימת עורקי הגוף בתהליך המשלב דלקת עם שקיעת כולסטרול והסתיידויות. טרשת עורקים היא הסיבה העיקרית לתמותה בקרב כלל האוכלוסיה. סתימת עורקי הלב, העורקים הכליליים גורמת להתקפי הלב (Myocardial Infarction = MI) ואילו סתימת עורקי המוח גורמת לאוטמים במוח, לשבץ מוחי (Cerebro Vascular Accidents = CVA). התהליך הטרשתי פוגע בעורקים בתהליך ממושך המתפתח לאורך שנים רבות. MI ו-CVA גורמים הן לתמותה מיידית (מייד או בסמוך לאירוע) והן לתמותה מאוחרת בגין הנזק לתיפקוד הלב והפגיעות הנוירולוגיות בהתאמה.

טרשת העורקים פוגעת גם בעורקי הגפיים, בפרט הרגליים. סתימת עורקים אלה נקראת בשם Peripheral Arterial / Vascular Disease (PAD / PVD). קיום מחלה זו מהווה סמן מובהק לקיצור ניכר של תוחלת החיים.

לנוכח כל האמור לעיל, אין זה מפליא שטרשת העורקים מוגדרת כגורם העיקרי לתמותה בקרב כלל האוכלוסיה.

בהתאם וכצפוי לקה / סבל החולה מ-PAD / PVD על רקע של טרשת חמורה שפגעה באורטה (אבי-העורקים) ובכלי הדם היוצאים ממנה, ביפרט בעורקי האגן והרגליים. הטרשת תועדה לא פעם בבדיקות CT של הבטן החל משנת 2018, "פלקים מסויידים לכל אורך כלי הדם". בעקבות מימצא זה נבדק החולה גם ע"י "כירורג של כלי דם". **מחלת ה-PAD / PVD** מהווה סמן מובהק לקיצור של תוחלת החיים. במעקב אחר החולים במחלה זו נימצא שמרבית החולים מתים במהלך 10 שנים ממועד האבחנה (ניספח מס. 1).

בעיית בריאות חמורה במידה קיצונית היא בעיית העישון של החולה.
עישון. למותר לציין את ניזקי העישון. ידועה הפגיעה הריאתית אולם העישון פוגע גם באברי גוף אחרים לדוגמא הפגיעה בעורקי הגוף הנובעת הן מהאצת טרשת העורקים והן מפגיעה ישירה במנגנונים אחרים.
הפגיעה בריאות מתבטאת, א) במחלה חסימתית (חסימת דרכי הנשימה) כרונית (Chronic Obstructive Pulmonary Disease = COPD).
ב) בגרימת סרטן הריאות.
חשוב להדגיש שהעישון גורם / תורם להתפתחות תהליכים ממאירים (סרטן) לא רק בריאות כי אם גם באברי גוף אחרים דוגמת הוושט והלב.

בגין ניזקי הגוף המפורטים לעיל גורם העישון לאובדן של למעלה מ- 10 שנות חיים.
(זהו ערך ממוצע וברור שלמעשנים כבדים יש קיצור תוחלת גדול יותר).
(ניספח מס. 2).

החולה עישן $\pm$ קופסא ליום במשך 50 שנה ובהתאם הוגדר כמעשן כבד.
בתיעוד הרפואי מוגדר החולה לא פעם כסובל מהסיבוך הריאתי הטיפוסי למעשנים, דהיינו, מ- COPD.
מהתיעוד הרפואי עולה שהחולה ניגמל מעישון כ- 3 שנים עובר ל"אירוע".
ברור שהפסקת עישון אינה "מרפאה" את ניזקי העבר. יתרה מזאת הנזק מתמיד או אף נמשך גם בתקופה שלאחר הגמילה (ראה ניספח מס. 3).

בעיית בריאות נוספת בה לקה החולה היא אוסטיאופורוזיס ("בריחת סידן")
חשוב לציין שאוסטיאופורוזיס גורמת לקיצור תוחלת (ניספח מס. 4).

לסיכום.
אין כל ספק שבגין מחלות החולה עובר ל"אירוע", מחלות שאינן קשורות כלל לטענות התביעה, היתה תוחלת חיו במועד "האירוע" מקוצרת במידה משמעותית ואני מעריך קיצור זה ב- 10 שנות חיים.
במועד "האירוע" היה החולה בן 71, התוחלת של כלל הגברים בישראל בגיל זה היא 15 שנים (הגעה לגיל 86), ומכאן בגין הקיצור עמדה אז תוחלתו שלו על 5 שנים בלבד (הגעה לגיל 76).

תעודה זו ניתנת על ידי לשם הגשתה לבית המשפט, וידוע לי כי לפי החוק הפלילי בעניין עדות שקר בשבועה, דין תעודה זו כשהיא חתומה על ידי כדין עדות שנתתי בבית המשפט.

(כנוע י. קרא)

השפעת מחלת כלי הדם ההיקפית על התוחלת
 Peripheral Vascular Disease -> PVD
 Peripheral Arterial Disease -> PAD זהה ל-

לענין מחלת כלי הדם ההיקפית, דהיינו של הגפיים, הרי שזו לכשלעצמה מהווה סמן לתוחלת מקוצרת ביותר בשיעור של פי 2-5 מאשר בכלל האוכלוסיה. (Ann. Intern. Med. 113: 135, 1990).

(1) לפי מאמר מערכת בעיתון היוקרתי-
 New England Journal of Medicine (NEJM): 325: 577, 1991.
 "There is an overall reduction of 10 years in life expectancy among patients with peripheral vascular disease". "The mortality rate is 20-30% 5 years after diagnosis, 40-72% after 10 years & 74% after 15 years".

(2) במאמר אחר באותו עיתון (NEJM 326: 381, 1992) דיווחו שכאשר עקבו אחר חולים עם PAD 61.8% מכלל הגברים נפטרו תוך 10 שנים.

(3) NEJM 357: 293, 2007
 The risk of myocardial infarction (MI) or stroke is 3 times as high as the risk in patients without PAD.
 The annual rate of MI, stroke or death was 5%.

JAMA Oct 11, 2016 (מאמר מנויף)

Screening, Evaluation, and Treatment of Peripheral Arterial Disease (PAD)

Christopher L. Skelly, MD; Adam S. Cifu, MD

GUIDELINE TITLE Society for Vascular Surgery Practice Guidelines for Atherosclerotic Occlusive Disease of the Lower Extremities: Management of Asymptomatic Disease and Claudication

DEVELOPER Society for Vascular Surgery (SVS)

RELEASE DATE March 2015

FUNDING SOURCE SVS

TARGET POPULATION Patients with asymptomatic peripheral arterial disease (PAD) and patients with intermittent claudication

MAJOR RECOMMENDATIONS

- Screening for lower extremity PAD in the absence of risk factors, history, signs, or symptoms of PAD should not be done.

- The ankle-brachial index (ABI) is the first-line noninvasive test to establish a diagnosis of PAD in individuals with symptoms or signs suggestive of disease. When the ABI is borderline or normal (>0.9) and symptoms of claudication are suggestive, the committee recommends an exercise ABI.
- Multidisciplinary comprehensive smoking cessation interventions for patients with asymptomatic PAD who use tobacco are recommended.
- Invasive treatments for PAD in the absence of symptoms, regardless of hemodynamic measures or imaging findings demonstrating PAD, should not be done.
- A supervised exercise program (walking a minimum of 3 times per week, 30 to 60 minutes per session, for at least 12 weeks) as first-line therapy to all suitable patients with intermittent claudication (IC) is recommended.

Summary of the Clinical Problem

Atherosclerotic PAD affects 8.5 million people in the United States¹ and nearly 202 million people worldwide²; from 2000 to 2010, the prevalence of PAD increased by 23.5%.³ When atherosclerosis causes stenosis in the distal aorta and below, patients may be asymptomatic, experience exertional ischemic leg symptoms such as IC, or develop critical limb ischemia. Intermittent claudication is characterized by pain in a defined muscle group (typically the calf muscles) that is relieved by rest; IC significantly impairs both walking distance and quality of life. Treatment strategies for PAD that were evaluated in the guidelines range from lifestyle modification (diabetes control, exercise, and smoking cessation) to medical therapy (statins, antiplatelet agents, and other medications such as cilostazol and pentoxifylline), and revascularization (open or endovascular).³ This guideline synopsis focuses on 2 questions: whether to screen asymptomatic patients for PAD and whether treatment strategies (surgery, endovascular or exercise therapy) improve clinical outcomes compared with medications.

Characteristics of the Guideline Source

Guideline development was sponsored by the SVS and carried out using the GRADE framework. The guideline group was a balanced multidisciplinary group representing a variety of methodological experts and clinicians as well as populations with PAD expected to be affected by the guideline. The committee undertook an evidence-based review to examine the rationale for screening for asymptomatic PAD and the comparative effectiveness of current treatments for IC.^{4,5} The reviews were published concomitant to the guidelines.³ The guidelines committee incorporated the evidence into the recommendations and the final guidelines were peer reviewed by the SVS documents oversight committee and externally reviewed by the Knowledge and Evaluation Research Unit at Mayo Clinic. A conflict of interest disclosure was completed

by all committee members and more than 50% of the writing group was free of any relevant conflicts³ (Table).

Evidence Base

The ABI is the ratio of the highest systolic blood pressure measured at the ankle to that measured at the brachial artery. The ABI is the primary method for establishing the diagnosis of PAD. An ABI of 0.9 or less has a high sensitivity (79%-95%) and specificity ($>95\%$) for diagnosing PAD compared with angiography,⁶ and an ABI of less than 0.9 or greater than 1.4 predicts an increased risk of major cardiovascular events.⁷ Studies were identified through a search of multiple databases from 2005 to June 2014. There were no randomized trials that compared screening with ABI with an unscreened control group. Identified studies included 40 studies enrolling 139 830 screened individuals.⁴ Screening asymptomatic patients resulted in a yield of 17% (range, 1%-42%) for an abnormal ABI (defined as <0.9 for most studies) in 140 065 patients.⁴ The heterogeneity of the screening yield was attributable to the heterogeneity in the prevalence of cardiovascular risk. Studies that showed lower

Table. Guideline Rating

Standard	Rating
Establishing transparency	Good
Management of conflict of interest in the guideline development group	Fair
Guideline development group composition	Good
Clinical practice guideline-systematic review intersection	Good
Establishing evidence foundations and rating strength for each of the guideline recommendations	Good
Articulation of recommendations	Good
External review	Fair
Updating	Fair
Implementation issues	Good

prevalence enrolled younger patients with no history of cardiac disease, whereas studies showing higher prevalence enrolled older patients with more cardiovascular risk factors, in particular people with diabetes and smokers. Patients with PAD had higher adjusted risk of all-cause mortality (hazard ratio, 2.99; 95% CI, 2.16–4.12) and of cardiovascular mortality (hazard ratio, 2.35; 95% CI, 1.91–2.89).

The studies of treatment modes for IC included randomized trials or systematic reviews. These trials enrolled patients with claudication and evaluated open bypass, endovascular revascularization, or exercise therapy. Primary outcomes included mortality, amputation, and quality of life, which are patient-important outcomes. Other outcomes were walking distance, measure of flow, patency, cost, and health care utilization data.⁴ Included trials were limited to those published between 2005 and June 2014. Eight systematic reviews were found: 3 Cochrane systematic reviews of randomized trials on exercise therapy, 2 systematic reviews comparing supervised exercise therapy with endovascular therapy, and 3 systematic reviews of nonrandomized surgical case series: 12 trials evaluated endovascular or open approaches. Compared with medical therapy alone, each of the 3 treatments (exercise therapy, surgery, and endovascular therapy) was associated with improved walking distance, claudication symptoms, and quality of life. Evidence supporting superiority of one therapy over another was limited. Although ABI improved faster with surgery or endovascular therapy compared with nonsurgical exercise or medical therapy, this may not correlate with clinical or patient-important improvement.

Benefits and Harms

Potential benefits of PAD screening are earlier diagnosis leading to improved lower extremity outcomes or cardiovascular outcomes related to recognition and treatment of undiagnosed cardiovascular disease. Although performance of ABI has no adverse effects or harms, downstream medical or surgical treatments are associated with harms. Most experts recommend against invasive testing after a positive screen and for standard medical treatment of PAD. There are no studies available comparing harms of different treatment modes among patients with PAD detected through screening.

Because supervised exercise is more cost-effective than endovascular therapy, supervised exercise therapy should be provided as the first line of treatment. Both endovascular therapy and surgical bypass have limited durability and inherent risks. Because it is not known which intervention is best for which type of patient, patients should be fully informed of the harms and benefits of all the treatment options being considered.

Discussion

The prevalence of PAD is increasing worldwide. Lacking robust clinical trials, decisions regarding the care of patients with asymptomatic PAD are influenced by changing demographic characteristics, evolving diagnostic and interventional technologies, and results from observational trials. In 2013, the US Preventive Services Task Force considered evidence to be insufficient to recommend ABI screening among asymptomatic adults without a diagnosis of PAD, cardiovascular disease, severe chronic kidney disease, or diabetes.⁸ Conversely, the American College of Cardiology and the American Heart Association joint practice guidelines recommended ABI screening for patients at increased risk of PAD, including adults aged 65 years or older or those aged 50 years or older with a history of smoking or diabetes.⁹ This lack of consistency in practice and in expert opinion was a major impetus for the SVS to develop guidelines for asymptomatic screening. The systematic review performed to develop these guidelines also identified areas where more studies are needed and pointed out areas where policy change might be beneficial.

Areas in Need of Future Study or Ongoing Research

The systematic review conducted for this guideline revealed that ABI testing may improve cardiovascular risk prediction, but the evidence does not support population screening of asymptomatic patients. There is a need for randomized trials of targeted subgroups who might benefit from PAD screening.

There is a need for large prospective comparative effectiveness trials to determine which treatment for patients with established PAD is most appropriate because the relative effectiveness of available treatments for patients with IC such as exercise therapy or revascularization (surgical or endovascular) is not well established. These studies should evaluate clinically important outcomes such as quality of life, limb-related outcomes, and mortality. These recommendations³ provide clear guidance for policy makers examining reimbursement decisions regarding supervised exercise programs, which have effective outcomes provided at a lower cost than more invasive interventions.

Related Guidelines and Other Resources

A Systematic Review for the Screening for Peripheral Arterial Disease in Asymptomatic Patients

A Systematic Review of Treatment of Intermittent Claudication in the Lower Extremities

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Display Settings: Abstract

See 1 article in Laeknabladid 2006:

Laeknabladid. 2006 Apr;92(4):263-9.

[Article in Icelandic]

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Abstract

OBJECTIVE: To assess the risk for coronary heart disease, myocardial infarction, cancer deaths, and all deaths associated with different smoking categories as determined by smoking status at a baseline examination only and at a baseline with reexamination 15-19 years later (persistent smokers).

MATERIAL AND METHODS: The participants were a random sample of 2930 men and 3084 women aged 34-61 years (when selected in 1967) invited for various standardized examinations under two periods, 1967-1972 and 1979-1991 and followed-up until the end of year 2001. The main outcome measures were clinical coronary heart disease, myocardial infarction, cancer deaths, and all deaths. Risk was calculated for each smoking category as determined by two assessments of smoking habits and also compared with the risk as determined by one baseline examination only.

RESULTS: Mean follow-up for men was 26 years (SD 9 years). For women the mean follow-up was 28 years (SD 7 years). There were substantial differences in hazard ratios (HR) and median lifetime in smoking groups as determined by one or two examinations. In men the greatest difference in hazard ratios was for cancer deaths (one examination: 2.80, two: 3.83) in women for total deaths (3.02 vs. 3.7). Loss of median lifetime was greatest in "heavy" cigarette smoking men (one examination: eight years; two examinations: 13 years), in women the corresponding figures were nine and 10 years, in "light" cigarette smokers, the figures for men were four and nine years, and for women four and six years.

CONCLUSIONS: Middle-aged men smoking one or more packets of cigarettes per day shorten their life expectancy by 13 years and middle-aged women by 10 years. Only one baseline determination of smoking status with subsequent follow-up underestimates the health risk associated with smoking by 15-40% at least in populations where smoking prevalence is declining.

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Publication Types, MeSH Terms

LinkOut - more resources

tend to show only modest compensation in response to a reduction in nicotine yield.

In addition, as the nicotine yield of combustible cigarettes declines, addicted smokers might switch to other nicotine-containing products, including smokeless-tobacco products or electronic nicotine-delivery systems (ENDS), such as e-cigarettes, e-cigars, and e-pipes. Such a shift might confer a net health benefit to the extent that such products are less harmful than combustible tobacco, but their use might also sustain nicotine dependence, encouraging continued use of low-nicotine cigarettes. We don't know how common such sustained "dual use" would be, nor can we predict its health consequences.

Finally, the development of new products (e.g., an FDA-approved agent that safely and effectively delivered nicotine to the alveolar bed) might further accelerate a decline in combustible-cigarette use and change the risk-benefit ratio.

The current study by Donny and colleagues adds to a growing literature supporting the feasibility and potential benefits of a national nicotine-reduction policy — one that, in our view, could help to end the devastating health consequences of combustible-tobacco use. The researchers found that as compared with smokers of standard-strength cigarettes (con-



An audio interview with Dr. Fione is available at NEJM.org

taining 15.8 mg of nicotine per gram of tobacco), regular smokers who switched to very-low-nicotine cigarettes (0.4 mg per gram) for 6 weeks had reductions in nicotine exposure, numbers of cigarettes smoked, and nicotine dependence. Moreover, they attempted to quit smoking at a rate double that of participants smoking standard-strength

cigarettes (34.7% vs. 17% at 30-day follow-up). We believe these data support exploration of a national nicotine-reduction policy, and we recommend that additional attention be paid to low-nicotine cigarettes as a potential clinical smoking-cessation resource.

Of course, as Donny et al. note, such results do not necessarily reflect what would occur over much longer use of low-nicotine cigarettes, in a broader population, with the possibility of dual use of other nicotine-delivery systems, and when there is no prospect of access to higher-nicotine cigarettes (i.e., if all combustible-tobacco products had to be low nicotine). It is also difficult to know the extent to which manufacturers and smokers could "game the system" by modifying their tobacco products (e.g., selling high-nicotine "black market" cigarettes or spiking low-nicotine cigarettes with more nicotine). Nevertheless, we think that a national nicotine-reduction strategy could play an important role in preventing another generation of young Americans from becoming dependent on cigarettes and reducing smoking prevalence among inveterate smokers, who might either abstain entirely or replace combustible cigarettes with presumably safer alternatives such as nicotine-replacement medications and ENDS.

We recommend that the FDA consider developing and implementing a nicotine-reduction policy that encourages the use of nicotine products at the low end of the continuum of risk for such products. As Mitch Zeller, who would later become the director of the FDA Center for Tobacco Products, stated in 2013, "Anyone who would ponder the endgame must acknowledge that the con-

tinuum of risk exists and pursue strategies that are designed to drive consumers from the most deadly and dangerous to the least harmful forms of nicotine delivery."³ Our ability to transition smokers to the use of less harmful nicotine-delivery systems would be greatly improved if the makers of products (such as e-cigarettes) that reputedly cause less harm would seek FDA approval for them, providing evidence that they are safe and effective as smoking-cessation aids and that they yield benefit at both the individual and population levels.

If people smoke for the nicotine but die from the tar arising from tobacco combustion, why not disassociate the two? We are increasingly convinced that reducing the nicotine content of combustible-tobacco products would undercut the motivation to smoke, that young people who continued to experiment with cigarettes would not become dependent on them, and that adult smokers would either get their nicotine from another source that is markedly safer or quit using nicotine altogether.

Smoking kills half the people who engage in it long term, robbing them of 10 to 15 years of life, according to the Centers for Disease Control and Prevention.

Given the size of the current population of U.S. smokers, we can expect at least 20 million Americans to die prematurely if they continue to smoke. Reducing the nicotine content of combustible tobacco to levels that will not sustain dependence seems to us to be the most promising regulatory policy option for preventing those 20 million premature deaths.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

NEJM Oct 1, 2015

Cigarette Smoking, Cessation, and Risk of Heart Failure With Preserved and Reduced Ejection Fraction

Ning Ding, MD, ScM, Amil M. Shah, MD, Michael J. Blaha, MD, MPH, Patricia P. Chang, MD, MHS, Wayne D. Rosamond, PhD, Kunihiro Matsushita, MD, PhD

ABSTRACT

BACKGROUND Smoking is well-recognized as a risk factor for heart failure (HF). However, few studies have evaluated the prospective association of cigarette smoking and smoking cessation with heart failure with preserved ejection fraction (HFpEF) and heart failure with reduced ejection fraction (HFrEF) as distinct phenotypes.

OBJECTIVES The aim of this study was to quantify the association of cigarette smoking and smoking cessation with the incidence of HFpEF and HFrEF.

METHODS In 9,345 ARIC (Atherosclerosis Risk In Communities) study White and Black participants without history of HF at baseline in 2005 (age range 61-81 years), we quantified the associations of several established cigarette smoking parameters (smoking status, pack-years, intensity, duration, and years since cessation) with physician-adjudicated incident acute decompensated HF using multivariable Cox models.

RESULTS Over a median follow-up of 13.0 years, there were 1,215 incident HF cases. Compared with never smokers, current cigarette smoking was similarly associated with HFpEF and HFrEF, with adjusted HRs ~ 2. There was a dose-response relationship for pack-years of smoking and HF. A more extended period of smoking cessation was associated with a lower risk of HF, but significantly elevated risk persisted up to a few decades for HFpEF and HFrEF.

CONCLUSIONS All cigarette smoking parameters consistently showed significant and similar associations with HFpEF and HFrEF. Smoking cessation significantly reduced the risk of HF, but excess HF risk persisted for a few decades. Our results strengthened the evidence that smoking is an important modifiable risk factor for HF and highlighted the importance of smoking prevention and cessation for the prevention of HF, including HFpEF.
(J Am Coll Cardiol 2022;79:2298-2305) © 2022 by the American College of Cardiology Foundation.

Heat failure (HF) affects at least 26 million people worldwide. Around 6.2 million U.S. adults are estimated to have HF. This estimate is projected to exceed 8 million in 2030, partially because of the aging population. Although much improved in the last few decades, the prognosis of HF is still devastating, with a 1-year mortality of ~30% after its diagnosis. Preventive approaches are crucial for HF, especially for heart

failure with preserved ejection fraction (HFpEF), because HFpEF lacks specific treatment with robust evidence to date. Notably, the prevalence of HFpEF is increasing relative to heart failure with reduced ejection fraction (HFrEF).

Smoking is considered a major modifiable risk factor for HF, accounting for 14% of excess risk of incident HF.¹ Recent systematic reviews showed an increased risk of HF among current and former

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the <https://www.elsevier.com/locate/ynjcc>.

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TABLE 1 Adjusted HRs (95% CIs) for Incident HF by Pack-Years of Smoking

	Never Smokers (n = 3,975)	Pack-Years of Smoking				Per 10 Pack-Years (n = 9,345)
		<10 (n = 1,742)	10-25 (n = 1,318)	25-40 (n = 1,025)	>40 (n = 1,285)	
HF						
Events	425	186	161	186	257	1,215
Adjusted HR	1.00 (reference)	1.03 (0.86-1.23)	1.19 (0.99-1.44)	1.96 (1.63-2.36)	2.35 (1.98-2.78)	1.14 (1.11-1.16)
HFpEF						
Events	213	77	76	77	112	555
Adjusted HR	1.00 (reference)	0.89 (0.68-1.17)	1.25 (0.95-1.64)	1.88 (1.42-2.47)	2.51 (1.95-3.22)	1.16 (1.12-1.20)
HFrEF						
Events	158	88	66	82	98	492
Adjusted HR	1.00 (reference)	1.19 (0.91-1.56)	1.13 (0.83-1.52)	1.94 (1.46-2.58)	1.93 (1.47-2.55)	1.09 (1.05-1.13)

Model adjusted for age (y), race (Black, White), sex (male, female), education level, body mass index, total cholesterol, high-density lipoprotein cholesterol, drinking status (current, former, never), systolic blood pressure, blood pressure-lowering medication use, cholesterol-lowering medication use, kidney function, diabetes, and prevalent coronary heart disease. All variables are time-fixed variables. Bold indicates statistical significance.

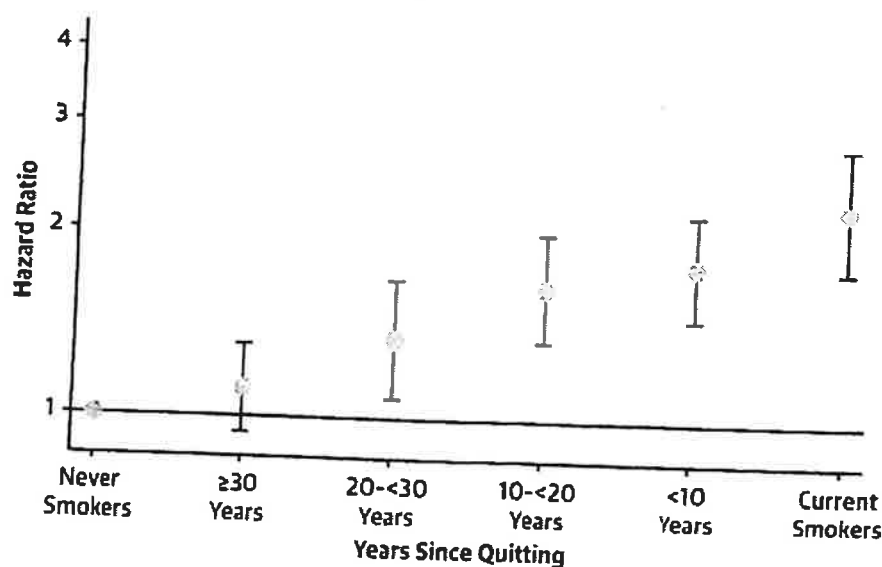
Abbreviations as in Table 2.

similar risk with never smokers for overall HF and the 2 HF phenotypes. When we used current smokers as the reference group, smoking cessation for <10 years had an HR of 0.85 (95% CI: 0.56-1.27) for HFpEF and 0.63 (95% CI: 0.42-0.95) for HFrEF (Supplemental Table 3). There was an approximately 50% lower risk for both phenotypes of HF among those who remained abstinent for over 30 years compared with current smokers. Competing risk analysis yielded similar results (Supplemental Table 4).

DISCUSSION

All cigarette smoking measures showed a robust dose-response relationship with incident acute decompensated HF in this large biracial community-based cohort, with a similar association for HFpEF and HFrEF. Those who smoked for ≥25 pack-years had ~2-fold increased risk for HF compared with never smokers. The associations were consistent regardless of demographic and clinical factors such as

FIGURE 1 Adjusted HR for Incident Heart Failure by Years Since Cessation



Longer duration of smoking cessation was associated with reduced risk of incident heart failure. Results shown are from Cox model adjusted for age (years), race (Black, White), sex (male, female), education level, body mass index, total cholesterol, high-density lipoprotein cholesterol, drinking status (current, former, never), systolic blood pressure, blood pressure-lowering medication use, cholesterol-lowering medication use, kidney function, diabetes, and prevalent and incident coronary heart disease. All variables are time-varying variables.

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125.

Fig. 1. 1 - 5, 0-100% of the total number of eggs.

- (See "Cigarette smoking and other possible risk factors for lung cancer".)
- (See "Multiple primary lung cancers".)
- (See "Factors that modify breast cancer risk in women", section on "Alcohol use and smoking".)
- (See "Epidemiology and risk factors for head and neck cancer", section on "Tobacco products".)
- (See "Risk factors for gastric cancer", section on "Smoking".)
- (See "Epidemiology and nonfamilial risk factors for exocrine pancreatic cancer", section on "Cigarette smoking".)
- (See "Epidemiology, pathology, and pathogenesis of renal cell carcinoma", section on "Smoking".)
- (See "Epidemiology and risk factors of urothelial (transitional cell) carcinoma of the bladder", section on "Tobacco products".)
- (See "Critical intraepithelial neoplasia: Terminology, incidence, pathogenesis, and prevention".)
- (See "Carcinoma of the prostate: Epidemiology, risk factors, and pathology", section on "Other factors".)
- (See "Classification and epidemiology of anal cancer", section on "Cigarette smoking".)
- (See "Overview of cancer prevention", section on "Tobacco use".)

Pulmonary disease --- Epidemiologic studies indicate that cigarette smoking is the most important risk factor for COPD.

~~Smoking cessation reduces the accelerated decline of lung function and risk of incident COPD associated with smoking [8,15]. In addition, the~~

Topic Feedback

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smoking cessation con

Smoking cessation — Smoking cessation reduces the accelerated decline in lung function that is associated with smoking, which decreases the likelihood that COPD will develop [10,96,97].

This was illustrated by a retrospective cohort study (n = 8045) that found the incidence of COPD over 25 years was less among patients who had never smoked or quit smoking than among patients who continued to smoke [10]. Specifically, the incidence of COPD among never smokers, smokers who quit prior to the study, smokers who quit during the initial five years of the study, smokers who quit 5 to 15 years into the study, smokers who quit 15 to 25 years into the study, and those who continued to smoke was 4, 12, 5, 14, 24, and 41 percent, respectively among men. The incidence was 9, 11, 20, 25, 29, and 31 percent, respectively, among women.

Additional benefits of smoking cessation, as well as risks and approaches are discussed separately. (See "Benefits and consequences of smoking cessation" and "Overview of smoking cessation management in adults" and "Behavioral approaches to smoking cessation".)

Exposure avoidance — Reduction of environmental exposure to particulate matter, dusts, fumes, vapors, or organic antigens is associated with slower lung function decline, but to a much smaller degree than smoking cessation.

This was demonstrated by a retrospective cohort study (n = 9651), which found that decreased particulate matter concentration was associated with a small reduction of the annual rate of decline of the forced expiratory volume in one second (FEV₁) over 11 years [98]. Specifically, a 10 mcg per m³ annual decrease in the concentration of particulate matter was associated with a 3 mL reduction of the annual decrease of FEV₁. This effect is small and of limited clinical relevance to individual patients, but may have public health relevance [99].

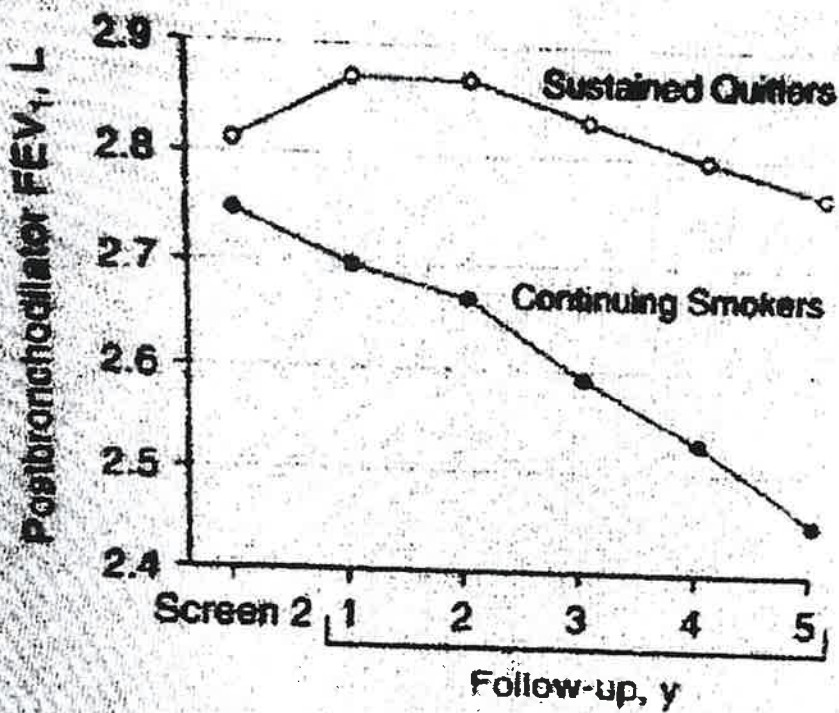
In a nine-year prospective cohort study, improved kitchen ventilation and/or use of biogas instead of biomass fuel were associated with a reduced decline in FEV₁ [100]. When both interventions were utilized, the decline in FEV₁ was decreased by 16 mL/year (95% CI 9-23 mL/year).

A variety of strategies are available to reduce the burden of inhaled particles, gases, vapors, and fumes [1,103]:

- Implement, monitor, and enforce strict control of airborne exposure in the workplace
- Initiate intensive and continuing education of workers, managers, clinicians, and legislators
- Promote smoking cessation since smoking aggravates exposure to other particles and gases

Biomass fuels are used for cooking and promote use of clean fuels

Effect of smoking cessation on lung function



Arthonisen NR et al, JAMA 1994 272:1497

IPCRG

CAHAG

COPE Dr Vincent Mak - ppt download

Osteoporosis (בריחת סידן)

בריחת-סידן, שברים ותמותה

Ref. 1) Kelley's Textbook of Rheumatology, 2005, page 1473.

Ref. 2) Osteoporosis Int. (International) 2004, pages 897-902.

המאמר מדבר על ה- Global burden of osteoporosis
אם לשפוט רק לפי אספקט – השברים בירך, מדובר על עליה עצומה בתחלואה
ובתמותה.

Ref. 3) Osteoporosis Int. 2006, Pages 1726-33.

"שברים אוסטיאופורוטים הם גורם משמעותי ביותר לתחלואה ולתמותה".

Ref. 4) Osteoporosis Int. 2004, Pages 38-42.

"We conclude that the risk of death is increased in patients with osteoporosis".

Ref. 5) Osteoporosis Int. 2007, Pages 721-32.

Time trends of mortality after first hip fractures.
"at 1 month 9%; at 3 months 15.5%; at 1 year 26.5%;
at 2 years 36.2%."

Ref. 6) Mortality risk associated with low-trauma osteoporotic fracture and subsequent fracture in men and women.

Dana Bliuc, et al.

JAMA 2009; 301: 513-521.

Age-and sex-specific standardized mortality ratios (SMRs).

Age-adjusted SMRs were increased following hip fractures (SMRs, 2.43), vertebral fractures (SMRs, 1.82) for both women and men, mortality was increased for all ages for all fractures.

Conclusion: All low-trauma fractures were associated with increased mortality risk.

Ref. 7) Prevention of falls and consequent injuries in elderly people.

Pekka Kannus, et al.

The Lancet 2005; 366: 1885-93.

ORIGINAL ARTICLES

Established Osteoporosis Associated with High Mortality after Adjustment for Age and Co-Morbidities in Postmenopausal Japanese Women

Masataka Shiraki, Tatsuhiko Kuroda, Shiro Tanaka

著者情報

キーワード: osteoporosis, fracture, mortality, co-morbidities

2011 年 50 巻 5 号 p. 397-404

DOI <https://doi.org/10.2169/internalmedicine.50.4437>

Objective Osteoporosis has been reported to increase the risk of mortality. However, these reports did not evaluate the effects of co-morbidities and the severity of osteoporosis on mortality. The aim of our study was to determine whether or not major osteoporotic fractures contribute to the increased mortality risk in Japanese women.

Method We conducted a prospective observational study. Risk factors contributing to mortality were assessed by Cox's proportional hazard model.

Subjects A total of 1,429 ambulatory postmenopausal female volunteers aged over 50 years old were enrolled in the study. Information was obtained from the subjects on baseline biochemical indices, bone mineral density (BMD), prevalent fractures, and co-morbidities. Mortality was assessed and confirmed by the certificates or hospital records. The subjects were classified into three categories in accordance with or

https://www.jstage.jst.go.jp/article/internalmedicine/50/5/50_5_397/_article/-char/ja/?utm_source=chatgpt.com

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without osteoporosis. The osteoporotic group was further categorized by the basis of the presence or absence of major osteoporotic fractures.

Results Mean age and SD of the participants were 66.5 ± 9.3 (50-90) years old. The participants were followed for a total of 4.5 ± 3.5 years (mean $\pm$ SD) and a total of 141 participants (9.9%) died during the observation. In addition to the traditional risks for mortality, such as age (Hazard ratio, 2.817, 95% CI, 2.237-3.560, $p < 0.0001$), BMI (HR 0.504, 0.304-0.824, $p = 0.0061$), prevalent malignancies (HR 2.885, 1.929-4.214, $p < 0.0001$), dementia (HR 1.602, 1.027-2.450, $p = 0.038$) and cardio-vascular disease (HR 1.878, 1.228-2.787, $p = 0.0043$), the serum level of creatinine (HR 2.451, 1.107-5.284, $p = 0.027$) and severity of osteoporosis (HR 1.390, 1.129-1.719, $P = 0.0018$) were found to be significant independent risk factors for all-cause mortality.

Conclusion These results emphasize the importance of osteoporotic fracture in terms of survival.

Osteoporosis-Associated Mortality in Postmenopausal Women in the United States From 1999 to 2023: A CDC WONDER-Based Study

Review began 06/11/2025
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Published 07/11/2025

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DOI: 10.7759/cureus.87721

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Abstract

Background and Aim: Osteoporosis remains a significant contributor to illness and death among postmenopausal women, primarily due to complications from fractures. This study examined national trends and disparities in osteoporosis-related mortality over a 24-year period.

Methods: Mortality records of postmenopausal women from 1999 to 2023 were analyzed using the Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiologic Research (CDC WONDER) database to assess osteoporosis-related deaths. Age-adjusted mortality rates (AAMRs) were calculated and examined across time, demographic groups, geographic regions, and fracture involvement. Statistical trend analysis was used to evaluate changes in mortality patterns over time.

Results: A total of 232,877 osteoporosis-related deaths were recorded. The overall AAMR declined from 29.35 in 1999 to 12.00 in 2023 (average annual percent change (AAPC): -3.75%; 95% CI: -4.71 to -2.77; $p < 0.00001$). Mortality due to osteoporosis with pathological fracture showed a sharper decline (AAPC: -5.14%) compared to osteoporosis without fracture (AAPC: -3.62%). White women had the highest AAMRs throughout, though all racial/ethnic groups experienced significant reductions. Regional analysis revealed the highest mortality rates in the Midwest and West, with Vermont reporting the highest state-level AAMR (74.97). Recent years (2018-2021) showed non-significant increases in mortality across subgroups, which may be associated with healthcare disruptions during COVID-19.

Conclusion: Osteoporosis-related mortality among postmenopausal women significantly declined over the past 25 years, reflecting advances in diagnosis, treatment, and prevention. However, persistent racial, geographic, and fracture-related disparities underscore the need for targeted public health interventions and equitable access to osteoporosis care.

Categories: Public Health, Epidemiology; Public Health, Orthopedics

Keywords: cdc-wonder, mortality trends, osteoporosis, postmenopausal women, united states

Introduction

Osteoporosis is a progressive systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to increased bone fragility and susceptibility to fractures. Although both men and women are affected, postmenopausal women are at particularly high risk due to the sharp decline in estrogen levels, which accelerates bone resorption. As women transition into menopause, they face a physiological shift that greatly increases the likelihood of skeletal complications. In the United States (US), it is estimated that between one-third and one-half of women over the age of 50 will experience an osteoporotic fracture in their lifetime, including fractures of the hip, spine, or wrist.

While osteoporosis is often said to be a silent, degenerative disease, the clinical consequences of its complications can be both catastrophic and enduring. Hip and vertebral fractures are among the most severe, not only because of the high associated mortality (up to 24% of women over 50 die within one year of a hip fracture) but also because of the cascade of other serious outcomes that follow. Fractures often result in chronic pain, kyphosis, and spinal impairment, which impair mobility and posture and contribute to long-term disabilities. Vertebral compression fractures can lead to a decrease in height, stooped posture (Dowager's hump), and altered biomechanics, which further increase the risk of falls and subsequent fractures.

Beyond physical symptoms, osteoporosis and its complications severely impact mental health and quality of life. Many patients develop depression, anxiety, and fear of falling, which leads to social withdrawal and isolation. These psychosocial effects are compounded by the loss of independence, especially among older adults who may become reliant on caregivers or require institutionalization after a major fracture.

How to cite this article

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[11]. Complications such as immobility-related thromboembolic events, pressure ulcers, and hospital-acquired infections (e.g., pneumonia, urinary tract infections (UTIs), and sepsis) further contribute to morbidity and mortality, particularly following hip fractures. Studies report that one-year mortality rates after hip fracture can reach 24%, and up to 30% of patients experience at least one serious postoperative complication [12].

Over the past two decades, initiatives in the US healthcare system, including expanded bone mineral density (BMD) testing and fracture prevention strategies, have aimed to reduce the burden of osteoporosis. However, disparities in access, awareness, and adherence to treatment persist. The aging US population is projected to include over 61 million women aged 50 and older by 2030, intensifying the need for improved prevention, diagnosis, and management of osteoporosis [13].

Despite the availability of effective pharmacological therapies, osteoporosis remains underdiagnosed and undertreated, especially after the first fracture [14]. Women from racial and ethnic minority groups, as well as those in rural or socioeconomically disadvantaged areas, face a compounded risk due to healthcare inequities. The presence of comorbidities, such as diabetes, cardiovascular disease, and cognitive impairment, further complicates recovery and increases mortality risk [15].

Our study uses national data from the Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiologic Research (CDC WONDER) database to evaluate osteoporosis-related mortality in postmenopausal women from 1999 to 2023. By examining temporal trends, racial and geographic disparities, and systemic implications, this study aims to inform future interventions that better address the full burden of osteoporosis in the US.

Materials And Methods

Study setting and population

This descriptive study used the CDC WONDER database death certificate data from 1999 to 2023, to examine osteoporosis-related mortality in postmenopausal women. For the purpose of this study, postmenopausal women were defined as females aged 55 years and older, consistent with epidemiologic norms. Data were analyzed using codes from the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), specifically codes M80 (osteoporosis with pathological fracture) and M81 (osteoporosis without pathological fracture). Previous research, particularly on mortality rates from cardiovascular disorders, supported the approach utilized in this study, proving its trustworthiness [16]. The dataset contains death certificate data from all 50 states and the District of Columbia, including both underlying and contributing causes of death. For the analysis, deaths involving osteoporosis in postmenopausal women were recognized if they appeared anywhere on the death certificate, whether as a contributory or underlying cause. This study was exempt from institutional review board approval since it made use of publicly available, de-identified government data. The study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for reporting observational research.

Data extraction

Data on population size, year, place of death, demographics, census region, and state were gathered for analysis. Race/ethnicity categories included non-Hispanic (NH) White, Hispanic or Latino, NH American Indian or Alaskan Native, and NH Asian or Pacific Islander. These demographic categories were generated from information recorded on death certificates, which has been used in previous studies using the WONDER database [17]. The country was divided into four areas based on the definitions provided by the US Census Bureau: Northeast, Midwest, South, and West.

Statistical analysis

To analyze national trends in osteoporosis-related mortality in postmenopausal women, we calculated age-adjusted mortality rates (AAMRs) per 100,000 population from 1999 to 2023, stratified by year, race/ethnicity, state, and census region, with 95% CIs. AAMRs were calculated by adjusting the osteoporosis-related deaths in postmenopausal women to the 1999 US population standard. In order to evaluate the annual trends in mortality, we used the Joinpoint Regression Program (Joinpoint version 4.9.0.0, National Cancer Institute) to estimate the annual percent change (APC) in AAMR, with 95% CI [18]. This approach uses log-linear regression models to detect shifts in trends, and APCs were considered to be increasing or decreasing if the slope indicating the change in mortality was significantly different from zero, as determined by two-tailed t-tests; a p-value of < 0.05 was considered to be statistically significant.

Results

From 1999 to 2023, a total of 232,877 deaths were attributed to osteoporosis among postmenopausal women in the US. During this period, AAMR declined substantially, decreasing from 29.55 per 100,000 in 1999 to 12.00 per 100,000 in 2023. Between 1999 and 2002, mortality rates increased significantly, with an APC of 2.99% (95% CI: 0.40 to 5.63; $p = 0.0269$). This was followed by a statistically significant decline from 2002 to