RESEARCH LETTERS

The Relationship Between Clinical Benefit and Receipt of Curative Therapy for Prostate Cancer

Life expectancy (LE) and tumor characteristics are clinical factors that affect the likelihood of benefit from curative therapy (CTx) for prostate cancer. Treatment of patients with a shorter LE may contribute to additional costs or complications, without a commensurate improvement in quality of life or survival.[1-3] The National Comprehensive Cancer Network practice guidelines in oncology[4] recommend active surveillance as an alternative to CTx (radical prostatectomy or radiation therapy) for patients with low-risk tumor characteristics who have an LE of less than 10 years. For patients with intermediate-risk cancers and an LE of 10 years or more, CTx is recommended.[4] Although therapeutic options for patients with prostate cancer have expanded considerably in recent years, little is known about whether the treatment of men with early-stage prostate cancer has evolved.[5-7] It is unclear whether patterns of care correspond to the likelihood of clinical benefit from treatment, as determined by LE and tumor characteristics. We therefore assessed trends in the use of CTx across strata of potential clinical benefit.

See also page 311

Methods. Using the Surveillance, Epidemiology, and End Results (SEER)-Medicare–linked database, we identified men aged 67 to 84 years with localized prostate cancer that was diagnosed between 1998 and 2007, including only patients from registries that existed before the 2000 SEER expansion. We defined low-risk tumors as those with SEER grade 1 or 2 and stage T1 or T2a and moderate-risk tumors as those with SEER grade 3 or 4 or stage T2b-T2c.

A standard life table approach was used to estimate LE as a function of noncancer comorbidity.[8] Specifically, we used a sample of patients without a cancer diagnosis recorded in SEER from the Medicare 5% random sample to determine annual mortality rates for each age and comorbidity stratum and then used these rates to estimate LE. Patients with an LE of less than 5 years, 5 to 10 years, or 10 years or more were classified as having a short, intermediate, or long LE. The 10-year survival rates in these groups were 19.3%, 51.6%, and 76.1%, respectively.

We defined CTx as receipt of radiation therapy or prostatectomy within 9 months of cancer diagnosis, as defined by *International Classification of Diseases, Ninth Revision*, procedure codes and Healthcare Common Procedure Coding System codes (eAppendix [http://www.archinternmed.com]). Multivariable logistic regression was used to model the receipt of CTx after controlling for age, race, marital status, comorbidity, and SEER registry. χ^2 Tests were used to ascertain bivariate associations between the independent variables and the receipt of CTx. Interactions between LE and diagnosis year were assessed in low- and moderate-risk tumor groups.

Results. The study sample was composed of 39 270 patients (median age, 74 years); 43.2% had moderate-risk tumors. Nearly 83% of patients were white and 9% were black; 55.0% had no comorbid conditions, 34.3% had 1 to 2 conditions, and 10.4% had 3 or more conditions. Of the patients in the full sample, 64.3% received CTx. There was a strong association between LE and receipt of CTx. Approximately 39.1% of 3557 patients with a short LE, 62.7% of 23 721 patients with an intermediate LE, and 75.1% of 11 992 patients with a long LE received CTx ($P < .001$).

Prostate cancer treatment rates increased over time. Overall, CTx increased from 61.2% to 67.6% from 1998 through 2007 ($P < .001$). Within each tumor-risk category, the increase in CTx use differed across LE groups. Among men with moderate-risk prostate cancer, there was a substantial increase in CTx rates in the short LE group (from 38.0% in 1998-1999 to 52.1% in 2006-2007 [**Figure**]). Conversely, the use of CTx decreased from 80.7% to 80.0% among men with a long LE (LE × Time Interaction, $P = .02$). Among men with low-risk tumors, the use of CTx trended downward for men in the long LE category but increased for men in the short and intermediate LE categories (LE × Time Interaction, $P < .001$).

Comment. Men with localized prostate cancer may not receive CTx in accordance with clinical benefit. During our study period, there was increasingly aggressive treatment of patients with a low likelihood of clinical benefit, without a commensurate increase in the treatment of patients with a high likelihood of clinical benefit. While not treating potentially fatal cancer can reflect poor-quality care, aggressive management of disease that is unlikely to progress puts patients at risk for morbidity and increases cost without medical benefits.[1-3] Given widespread concerns about the rate of increase in Medicare expenditures, it is notable that the most substantial increase in treatment in our sample was noted among the patients who were least likely to benefit. Possible explanations include financial incentives, emergence of new therapies with perceived lower adverse effect profiles, and changes in patient preferences. The use of cancer therapies should be informed by clinical evidence and guided by patient preferences. Future work should explore how

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 06/19/2013

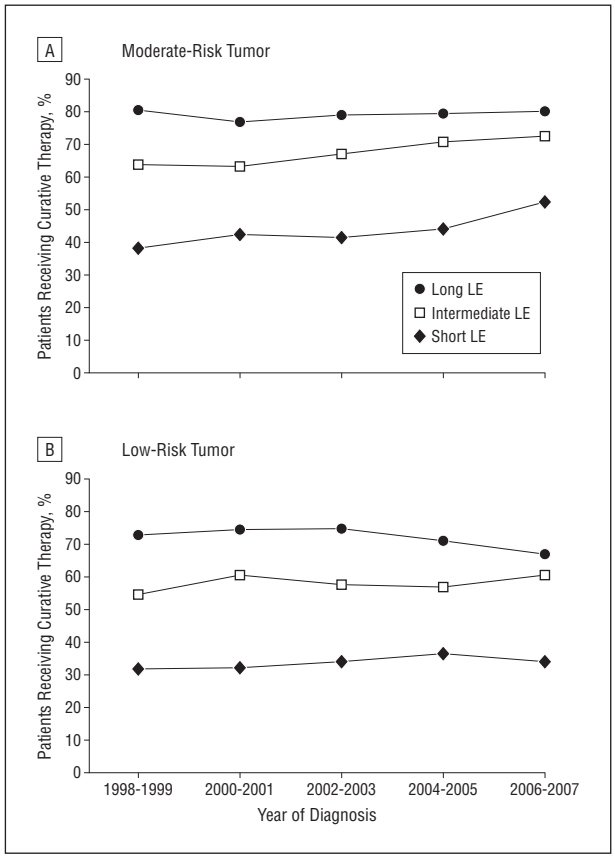

Figure. Percentage of patients with moderate-risk (A) and low-risk (B) tumor characteristics receiving curative therapy over time, stratified by life expectancy (LE).

better to incorporate both cancer characteristics and patient LE into decision making.

Ann C. Raldow, MD
Carolyn J. Presley, MD
James B. Yu, MD
Richa Sharma, MPH
Laura D. Cramer, PhD
Pamela R. Soulos, MPH
Jessica B. Long, MPH
Danil V. Makarov, MD, MHS
Cary P. Gross, MD

Author Affiliations: Cancer Outcomes, Public Policy, and Effectiveness Research (COPPER) Center, Yale Comprehensive Cancer Center (Drs Raldow, Presley, Yu, Cramer, Makarov, and Gross and Mss Sharma, Soulos, and Long), Section of General Internal Medicine (Drs Presley and Gross and Mss Soulos and Long), and Departments of Internal Medicine (Drs Presley and Gross and Mss Soulos and Long) and Therapeutic Radiology (Dr Yu), Yale University School of Medicine, New Haven, Connecticut; Department of Medicine, Memorial Sloan Kettering Cancer Center (Dr Raldow), and Department of Urology, New York University School of Medicine (Dr Makarov), New York, New York; and United States Department of Veterans Affairs, Washington, DC (Dr Makarov).
Correspondence: Dr Gross, Section of General Internal Medicine, Yale University School of Medicine, 333 Cedar St, PO Box 208025, New Haven, CT 06510 (cary.gross@yale.edu).
Author Contributions: All authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Raldow, Presley, Yu, and Gross. *Acquisition of data:* Sharma and Long. *Analysis and interpretation of data:* Raldow, Presley, Yu, Sharma, Cramer, Soulos, Long, and Makarov. *Drafting of the manuscript:* Raldow and Presley. *Critical revision of the manuscript for important intellectual content:* Raldow, Presley, Yu, Sharma, Cramer, Soulos, Long, Makarov, and Gross. *Statistical analysis:* Presley, Sharma, and Cramer. *Obtained funding:* Gross. *Administrative, technical, and material support:* Raldow. *Study supervision:* Makarov and Gross.
Financial Disclosure: None reported.
Funding/Support: This study was supported in part by the National Cancer Institute (5R01CA149045) and the James G. Hirsch Medical Student Research Fellowship.
Additional Contributions: The authors acknowledge the efforts of the Applied Research Program, National Cancer Institute; the Office of Research, Development and Information, Centers for Medicare & Medicaid Services; Information Management Services, Inc; and the Surveillance, Epidemiology, and End Results (SEER) Program tumor registries in the creation of the SEER-Medicare Database. This study used the SEER-Medicare–linked database.
Online-Only Material: The eAppendix is available at http://www.archinternmed.com.

1. Donabedian A. The quality of care: how can it be assessed? *JAMA*. 1988;260(12):1743-1748.
2. Miller DC, Sanda MG, Dunn RL, et al. Long-term outcomes among localized prostate cancer survivors: health-related quality-of-life changes after radical prostatectomy, external radiation, and brachytherapy. *J Clin Oncol*. 2005;23(12):2772-2780.
3. Potosky AL, Davis WW, Hoffman RM, et al. Five-year outcomes after prostatectomy or radiotherapy for prostate cancer: the prostate cancer outcomes study. *J Natl Cancer Inst*. 2004;96(18):1358-1367.
4. Mohler JL. The 2010 NCCN clinical practice guidelines in oncology on prostate cancer. *J Natl Compr Canc Netw*. 2010;8(2):145.
5. Bolenz C, Gupta A, Hotze T, et al. Cost comparison of robotic, laparoscopic, and open radical prostatectomy for prostate cancer. *Eur Urol*. 2010;57(3):453-458.
6. Cahlon O, Hunt M, Zelefsky MJ. Intensity-modulated radiation therapy: supportive data for prostate cancer. *Semin Radiat Oncol*. 2008;18(1):48-57.
7. Nguyen PL, Gu X, Lipsitz SR, et al. Cost implications of the rapid adoption of newer technologies for treating prostate cancer. *J Clin Oncol*. 2011;29(12):1517-1524.
8. Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. *Med Care*. 1998;36(1):8-27.

Increasing US Rates of Endocarditis With *Staphylococcus aureus*: 1999-2008

Estimates of the incidence and impact of bacterial infective endocarditis (IE) have been limited by the infrequency of the disease. Administrative data analyses can provide important information across a broad range of hospitals and regions. We used a recent nationally representative sample[1] to estimate the incidence of hospitalizations for bacterial IE in the United States.

Methods. We conducted a retrospective cohort study using the 1999 through 2008 Nationwide Inpatient Sample (NIS), which is produced by the Agency for Healthcare

©2012 American Medical Association. All rights reserved.

Downloaded From: http://archinte.jamanetwork.com/ on 06/19/2013