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Estimates of stage-specific preclinical sojourn time across 21 cancer types.

Michael S. Broder Sikander Ailawadhi Himisha Beltran L. Johnetta Blakely George Thomas Budd Laurie Carr Michael Cecchini Patrick Wayne Cobb Sarah N. Gibbs Anuraag Kansal Ashley Kim Bradley J. Monk Lee S. Schwartzberg Deborah J.L. Wong Irina Yermilov

Partnership for Health Analytic Research, LLC, Beverly Hills, CA; Mayo Clinic, Jacksonville, FL; Dana Farber Cancer Institute, Boston, MA; Tennessee Oncology, Nashville, TN; Cleveland Clinic Taussig Cancer Institute, Cleveland, OH; National Jewish Health, Denver, CO; Yale University, New Haven, CT; SCL Health, Billings, MT; GRAIL, Inc., Menlo Park, CA; Arizona Oncology (US Oncology Network), University of Arizona, Creighton University, Phoenix, AZ; West Cancer Center, Memphis, TN; UCLA Health, Los Angeles, CA

Abstract Disclosures

Abstract

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Background: Cancer progression rates following diagnosis are readily measured. However, the progression rate of cancer during the preclinical sojourn time is generally unobserved. Understanding the duration of preclinical stages ("dwell time") would allow clinicians to better identify appropriate screening intervals for cancer. We therefore elicited estimates of progression rate during the preclinical sojourn time for a wide variety of malignancies from a panel of clinical experts. **Methods:** We used a validated consensus methodology (RAND/UCLA modified Delphi panel method) to elicit per-stage dwell time estimates for 20 solid cancers and lymphoma from experts. Eleven experienced oncologists (general and subspecialists) from community and academic centers reviewed literature on the natural history of disease and estimated in number of years (<1 to 9+ years) how long it would take each cancer to progress from the beginning of clinically detectable Stage I/II/III to

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the beginning of the next stage in untreated adults. Cancer histological subtypes were grouped and experts were asked to provide an overall rating. Ratings were completed before and after a discussion of areas of disagreement. **Results:** Expert estimates and range of dwell time for 21 cancer types are provided in Table. Prostate and thyroid cancer were estimated to be the slowest growing, taking approximately 7 and 5 years respectively to progress through Stage I (range 4-8), 5 years to progress through Stage II (range 3-7), and 3 and 4 (range 2-5) years respectively to progress through Stage III. Esophageal, lung, liver/intrahepatic bile-duct, gallbladder, and pancreatic cancers were estimated to progress quickly through all three stages (1-2 years per stage). **Conclusions:** These findings summarize practicing oncologists' estimates of dwell time in preclinical disease. Experts agreed on dwell times although ranges were large and differences in cancer subtypes were not captured. Generally, estimates trend with published data on survival with treatment: cancers with higher survival (e.g., prostate, thyroid) were estimated to grow slower, while cancers with lower survival (e.g., pancreatic, liver/intrahepatic bile-duct, gallbladder) were estimated to grow faster. These estimates could be useful when determining screening intervals for these or any subset of these cancers.

Median (range) estimated number of years for cancer to progress from given stage to next stage.

Cancer	Stage I	Stage II	Stage III
Prostate	7 (5-8)	5 (4-6)	3 (2-5)
Thyroid	5.5 (4-8)	5 (3-7)	4 (2-5)
Kidney	5 (<1-7)	3 (<1-5)	2 (<1-2)
Uterus	4 (3-5)	3 (<1-5)	1.5 (<1-3)
Lymphoma	4 (2-6)	2.5 (<1-5)	2 (<1-3)
Cervix	4 (<1-5)	2.5 (<1-4)	<1 (<1-2)
Colon/Rectum, Sarcoma, Breast, Melanoma, Head and Neck, Bladder, Ovary, Stomach, Urothelial Tract, Anus	3 (<1-7)	2 (<1-5)	<1 (<1-4)
Esophagus, Lung, Liver/Intrahepatic Bile-duct, Gallbladder	2 (<1-5)	<1 (<1-2)	<1 (<1-2)
Pancreas	<1 (<1-2)	<1 (<1-2)	<1 (<1-<1)

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