

Ethical Pitfalls When Estimating Life Expectancy for Patients with Prostate Cancer

CASE PRESENTATION

Mr. C is a 75-year-old man diagnosed with intermediate risk prostate cancer. The initial diagnosis was prompted by an increase in prostate specific antigen (PSA) from 2.6 to 3.6 ng/mL during 1 year of testosterone replacement therapy. The testosterone treatments were withheld. Magnetic resonance imaging (MRI) of the prostate identified 2 regions of interest. MRI-fusion biopsy diagnosed prostate cancer in 4 of 16 total cores. The patient was estimated to have a greater than 10-year life expectancy (he is an avid cyclist with a medical history significant for diverticulosis, osteoporosis, hypogonadism) and, consistent with guidelines, was offered definitive treatment (radiation or surgery) as well as surveillance after a detailed discussion.

DISCUSSION

Shared decision making is widely advocated before screening for and potentially treating prostate, breast and other common malignancies.¹ Life expectancy plays a central role in driving shared decision making discussions, as our population ages, and patients and providers navigate the art of distinguishing those cancers that will affect survival or quality of life from those that will not. Thus, sharing accurate life expectancy estimates with patients is critical to helping them reach an informed decision, and may alter the risk-to-benefit considerations of screening and treatment.

Life expectancy can be estimated from general life tables (such as United States Social Security estimates) as well as generalized and disease specific risk calculators that estimate the likelihood of mortality at given time frames.² However, new risk prediction models may allow providers to share more specific estimates of life expectancy, ie telling a patient, "We estimate you have 2 years and 4 months to live."

As machine learning approaches allow for more precise life expectancy estimates, we cannot ignore the necessarily human doctor and patient interaction, while simply reporting data generated by algorithms. Instead, effective communication compels us to be

cautious and vigilant in their implementation, and conscious of the art of communicating the estimate as well as the uncertainty and variation inherent in the model. Most importantly, we should be exceedingly thoughtful about mitigating the potential unintended consequences of telling an individual that we expect him to live for a defined amount of time.

Sharing life expectancy estimates for patients considering treatment for any malignancy raises unique challenges. For example, patients considering cancer screening for the treatment of localized prostate cancer are likely to be healthy in contrast to the application of life expectancy estimates for patients managing decisions towards the end of life. They are also likely to be asymptomatic, and these shared decision making efforts are not intended to alleviate symptoms or improve current function. Finally, life expectancy estimates for this patient population will likely be measured in years or decades, and the uncertainty of future health and quality of life may be much greater than the risk of prostate cancer specific symptoms or death for an individual.

Understanding these challenges, we can consider dissemination of life expectancy estimates according to the 5 pillars of modern medical bioethics, which are autonomy, beneficence, parsimony, non-maleficence and distributive justice.³

Autonomy honors an individual's ability to choose treatments wisely. Accurate life expectancy tools will certainly increase patient autonomy but only if each one makes an active choice about receiving or forgoing life expectancy estimations. Just as it is inappropriate to draw a PSA or HIV test without counseling a patient beforehand, to respect patient autonomy we must explore whether each individual is interested in receiving detailed information regarding life expectancy. Even if he does, providers must consider whether a patient's present choice will lack fidelity to his future self. A patient's priorities are almost certain to change with time. He might place a high value on erectile function now but how will he and his partner value turgidity in 10 years?

Beneficence encompasses the provider's duty to improve the patient's health, and appropriate

prostate cancer treatment can improve survival, symptoms and function. Accurate estimation of life expectancy may also benefit patients even beyond treatment choice. For example, if the estimate clearly separates the modifiable risk factors, like smoking, then this may serve as an impetus to change this habit, for example through pursuing smoking cessation. These laudable goals can only be realized if there is sound, bidirectional communication in the clinician-patient dyad regarding the modifiable component of the life expectancy estimate. Life estimates can also help guide decisions regarding potential cancer screening, and potentially avert unnecessary anxiety and diagnostic tests.⁴ Finally, estimates can help guide non-medical life choices, such as financial planning, family and social arrangements, and other affairs that may be prioritized differently if life expectancy is more accurately assessed.

Parsimony compels us to steward resources wisely, avoiding waste and maximizing value. If life expectancy calculators improve population outcomes, by reducing unwarranted screening, unnecessary treatment and/or both, we could liberate resources that could then be used for other aspects of patient care or to address other societal concerns. Given the substantial number of men needed to treat to improve outcomes for prostate cancer and other malignancies, these resources could be robust.

Non-maleficence, or the duty to avoid harm, may, in contrast, give us pause before widely disseminating and implementing life expectancy calculators. Patients often overestimate their likely survival,⁵ and psychological harm may result from a lower than expected estimate. We know that depression affects life expectancy⁶ but can life expectancy drive depression? No studies have evaluated the effect a short life expectancy diagnosis may have on psychological distress, interpersonal strain, depression or even suicidality. This fact is especially relevant given that population based estimate models may poorly predict survival for an individual patient, sometimes by a significant margin.

Distributive justice calls on us to treat equals equally and unequals unequally. If we counsel 2 patients as equals based on a similar, but incorrect, life expectancy, we will be violating distributive justice principles. Better life expectancy estimates may help us avert this ethical trap. Similarly in interaction with parsimony, more efficient distribution of prostate cancer treatment resources may help us reduce unjust disparities in treatment by nonmedical social factors, such as race or income.

For the patient described above, his general life expectancy (greater than 10 years) suggested that there was potential benefit in treating intermediate risk prostate cancer. The patient wanted to minimize the risks of traditional therapies of curative intent

(radiation and surgery) and chose a new but more sparsely studied treatment (focal laser ablation). He balanced the risk of cancer with his desire to maintain quality of life. Would a more specific life expectancy estimate have changed his calculus? Would it alter the course of care for an individual considering PSA testing or biopsy after an elevated PSA, or treatment options with metastatic disease? Each of these scenarios deserves ample consideration.

TAKE HOME MESSAGES

Life expectancy estimates promise to enhance shared decision making discussions between patients with prostate cancer and providers, and are increasingly recommended by guidelines.¹ These tools may help stem the tide of prostate cancer over diagnosis and overtreatment. However, before they are widely deployed, clinicians must be trained on how to use them responsibly for which we provide 4 suggestions.

First, patients must be educated regarding the variability and uncertainty that come with each estimate. Second, clinicians should consider the opportunity to take advantage of a teachable moment to improve patient care. Third, an appropriate infrastructure should be deployed to avoid deleterious consequences of disclosing life expectancy to patients by bundling estimates with a multidisciplinary team that can address psychosocial concerns. Fourth, the beneficial and detrimental effects of implementation of life expectancy calculators need to be studied rigorously. As we gather new and better tools in our armamentarium to counsel each patient on what course of treatment is best for him, we must deploy life expectancy tools carefully and thoughtfully to maximize benefit and avoid unintended consequences.

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