Supplementary Materials for

Effect of physician disclosure of specialty bias on patient trust and treatment choice

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Observational Study

Materials and Methods

Participants (Table S1a) and Procedure

Our observational study data consisted of 219 transcripts of recorded surgeon-patient interactions in which the patients received a diagnosis of localized prostate cancer. All the patients were recruited from 4 Veterans-Affairs hospitals—Ann Arbor, Durham, Pittsburgh and San Francisco—as part of a larger study on prostate cancer decision-making (1, 2). The larger study was a trial to examine the impact of two different decision aids for localized prostate cancer treatment options (the decision-aids did not make a difference to patient's final treatment decisions) (1, 2).

Participants were recruited when a biopsy was scheduled or performed from the four hospitals between September 2008 and May 2012 and gave written consent. At this time, patients (N = 1022) received their decision-aid and completed a baseline survey that captured their demographics (age, race and education level). Race was collected in our observational study due to grant requirements and (in both studies) to investigate if race was correlated to different treatment decisions or preferences. Race options were defined by the investigator and consisted of Caucasian, African-American, Asian, Native American and Other.

Only men diagnosed with localized prostate cancer and, through chart review, had a Prostate-Specific Antigen level of less than 20 ng/mL and a Gleason score of 6 or 7, (N = 334) were asked to participate in the next part of the trial. This definition corresponded to the risk levels that the American Urological Association guidelines considered all treatment options (surgery, radiation and active surveillance) to be viable alternatives (3). All four VA hospitals offered these three treatment options. Patients who were eligible to continue in the trial were asked to complete a survey just before they were informed of their prostate-cancer diagnosis; 285 patients agreed to do so (85% of eligible patients; there was no demographic or clinical differences among participants who agreed to participate and those that did not).

The survey prior to diagnosis consisted of several questions including the use and satisfaction with the decision aid and, relevant, to the current manuscript, patients were asked about their desire to participate in shared decision making and their current treatment preference if they were to be diagnosed with prostate cancer.

Shared decision-making with the doctor was measured on a 5-point scale, an adaptation of Degner and Sloan's (1992) Control Preference Scale (4); 1=My doctor(s) will make the decision with little input from me, 2=My doctor(s) will make the decision but will seriously consider my opinion, 3=My doctor(s) and I will make the decision together, 4=I will make the decision after seriously considering my doctor(s) opinion, 5=I will make the decision with little input from my doctor(s). Low scores, therefore, reflect patients' preference for their physicians to make treatment decisions.

Treatment preference was measured with the following question: "Although you may not have cancer, we would like to know what treatment you think you might have if you were to have prostate cancer." Patients answered from a treatment list consisting of surgery, external beam radiation, brachytherapy, watchful waiting /active surveillance, other (e.g., hormone or experimental therapies). Although technically different, watchful waiting and active surveillance are grouped together for this study and used interchangeably in our manuscript.

All 285 patients agreed to have their consultation with the surgeon audio-recorded. Everyone in the exam room during the appointment provided consent to be audio recorded; this included physicians and any significant others accompanying the patient. A research associate set up an unobtrusive audio recorder in the exam room before the consultation and then left the room before the patient entered. Audio recordings were stripped of spoken HIPPA identifiers (e.g., names, dates, locations smaller than a state) before transcription. A small number (N = 27) of appointments were missed by research staff resulting in 258 audio-recordings (77% of eligible patients). There was no significant difference in the final treatment taken for those patients that we were able to audio-record and appointments that were missed by research staff and that we were able to check the final treatment decision, $\chi^2(4, N = 242) = 5.98$, $P = .20$. Research staff were unable to retrieve medical records for 39 patients out of the 258 patients whose consultation was audio-recorded to check the patient's final treatment decision; six of these transcripts (15.4%) (for which staff were unable to check final treatment decisions) were coded for a bias disclosure and the rest had no disclosure of bias, a similar proportion of bias statements to the transcripts in which we had access to the treatment decisions (16.0%), $\chi^2(1, N = 258) = 0.009$, $P = .92$.

Our final sample size was 219 (66% of eligible patients) consulting with 47 unique surgeons. Surgeons were not affiliated with more than one hospital. Neither patients nor physicians were aware of the design of the observational study although both were aware that the interaction was being audio-recorded and that the use of the decision-aid was of interest to researchers.

<u>Statistical Analysis</u>

We conducted generalized estimating equations with a Poisson distribution and log link function with robust standard errors and exchangeable correlation structure to account for our clustered data (multiple patients seeing the same doctor) and to report the relative risk (RR) of having surgery when patients heard a bias statement from their surgeon (5). This analysis accounts for non-independent observations and thus also accounts for surgeon individual differences (e.g., persuasiveness etc.). Our first model examined the relationship between having surgery and the presence of bias statements. Our second regression model examined if the relationship between choosing surgery and the presence of bias statements held when controlling for patient-specific variables (e.g., age, race, education, clinical stage of disease, etc.) that might contribute to changing the likelihood of choosing surgery. Our third regression model included variables from the surgeon-patient interaction (e.g., strength of treatment recommendations). The control variables are described in more detail below.

Patient-specific controls; Table 1, Regression model 2

Demographics. We controlled for patient age, race (Caucasian=1, non-Caucasian=0) and education level (higher scores indicate greater education).

Patient's desire for shared decision-making. Prior to receiving the diagnosis, patients were asked who will make their treatment decision if they were to have prostate cancer, on a 5-point scale (Table S1a), an adaptation of Degner & Slogan's Control Preferences Scale (4). Low scores reflect patients' preference for physician decision-making.

Patient's preferred treatment choice. Prior to receiving their diagnosis, patients were asked to report if they had a preferred choice of treatment if diagnosed with prostate cancer (surgery=1, other treatment=0).

Decision aid. As part of the larger study on prostate cancer decision-making, patients randomly received one of two different decision-aid booklets prior to receiving their prostate cancer diagnosis (the larger study concluded that the aids did not significantly alter patients' final treatment decisions (1)).

Clinical stage. Stage of the disease was retrieved from medical records and consisted of a simple classification based on the extent of the primary tumor: T1=tumor could not be felt or seen with imaging; T2=tumor can be felt or seen with imaging but is confined to the prostate gland, T3=cancer may have spread into the seminal vesicles. No patients were at T4 and lymph nodes were either clear or not checked.

Physician-patient consultation controls; Table 1, Regression model 3

Strength of treatment recommendations. Given that prior research on disclosure has shown that disclosure can lead advisors to give more biased advice (6, 7), we included the strength of the surgeon's treatment recommendations for surgery, radiation and active surveillance in order to control for the possibility that surgeons who disclose may give stronger recommendations for surgery than those who do not disclose.

Research assistants generated recommendation codes (Krippendorf alpha=.86) for each of the three main treatments (surgery, radiation, active surveillance) from the transcript ranging on a scale of +2 (surgeon explicitly recommended that treatment was the best option for the patient) to -2 (surgeon explicitly recommended the patient not to have that treatment). Scores of +1 and -

1 indicated that the surgeon's recommendations were less definitive, while a score of 0 indicated that the surgeon neither recommended for or against that treatment (Table S3).

Radiation oncologist appointment discussed. Surgeons also varied in whether they discussed the option of the patient meeting with a radiation-oncologist, which could impact the likelihood of patients choosing surgery. Research on second opinions has demonstrated that first advisors give more biased advice if they are aware that the advisee could seek a second opinion (8). This suggests that surgeons may increase the strength of their recommendation to have surgery if they also discuss the opportunity for the patient to see a radiation-oncologist. Research assistants coded the transcripts (Cronbach's alpha=.97) to record whether meeting with a radiation oncologist was not discussed (score=0) or discussed (score=1).

Supplementary Results

Participant characteristics (Table S1a)

In our observational study, there were no significant differences in whether patients heard a bias statement from their surgeon or not by patients' age, race, education, shared decision-making preferences, preferred treatment choice prior to diagnosis, clinical stage of disease or decision-aid book received**.**

Frequency of bias statements.

Thirty five patients out of 219 (16.0%) heard their surgeon admit to a specialty bias during their consultation in which the surgeon revealed the prostate cancer diagnosis. There were 47 unique surgeons; 26 (55.3%) surgeons never disclosed a specialty bias (91 patient interactions); three surgeons always disclosed a bias (4 patient interactions) and 18 surgeons varied in whether they disclosed a bias or not (124 patient interactions).

Correlations (Table S2)

A Pearson correlation between the presence of a bias statement and having surgery was positive and significant, $r = .36$, $P < .01$. A stronger recommendation to have surgery was positively and significantly correlated with the presence of a bias statement ($r = .36$, $P < .01$), as predicted by prior research (6, 7). A stronger recommendation to have surgery was also positively and significantly correlated with discussing a radiation oncology appointment ($r = .37$, $P < .01$), again in alignment with prior research suggesting that first advisors give more biased advice when they are aware that the advisee may seek a second opinion (8).

There was a negative correlation of having surgery with age ($r = -.24$, $P < .01$) and surgeons' recommendation to have surgery with age ($r = -.25$, $P < .01$). There was a significant positive correlation between recommending active surveillance and recommending surgery ($r = .33$, $P < .01$), and between recommending active surveillance and recommending radiation ($r = .21$, $P < .01$), suggesting surgeons would recommend active surveillance when also recommending one of the active treatments (surgery or radiation). There was a significant negative correlation between recommending radiation and recommending surgery, ($r = -.17$, $P < .05$).

Explicit bias disclosure (Table S4)

In the main manuscript, we used a broad definition for bias disclosure which included both explicit bias statements, e.g., "*I'm a surgeon, so I'm biased towards recommending surgery*" and implicit bias statements, e.g., "*I'm a surgeon so of course I'd lean towards* *surgery."* It could be argued that disclosure of a bias requires an explicit confession of bias from the surgeon who uses the word 'bias'. The word 'bias' alerts patients to potentially negative information. Therefore, we report additional analyses in this appendix on the association of patients' treatment choices with this explicit warning or bias disclosure from the surgeon. We find that the results are robust when the definition for disclosure requires the explicit disclosure of bias: A chi-square test revealed that patients whose surgeons explicitly admitted to a specialty bias were more likely to have surgery (64.3%, n=18/28) than those who did not (28.3%, n=54/191), $\chi^2(1, N = 219) = 14.35$, $P < .001$. Similarly, the first regression model revealed an increase in surgery with the presence of an explicit bias statement, RR= 2.29, 95% CI [1.70-3.07], $P < .001$ (Table S4, Model 1).

Further, the surgeon's explicit disclosure of bias was still positively and significantly related to the patient choosing surgery, RR = 1.89, 95% CI [1.26-2.84], $P = .002$, when potentially confounding variables (patient demographics, clinical stage of disease, patients' shared decision-making score, treatment preference prior to diagnosis, and decision-aid received) were added to the regression, (Table S4, Model 2). Adding additional controls for the strength of surgeons' treatment recommendations and discussion of a radiation-oncologist appointment (Table S4, Model 3) also did not alter the significant relationship between explicit bias disclosure and having surgery, RR = 1.69, 95% CI [1.13-2.53], $P = .01$.

Randomized Experiment

Materials and Methods

Participants (Table S1b) and Procedure

Our experiment consisted of 447 U.S. male citizens above the age of 50 recruited from GMI Lightspeed, a survey company, to participate for the 10-minute study. The study was approved by Georgetown University and Duke University IRBs.

Men were asked to imagine that they were meeting with a surgeon to learn the results of a recent prostate biopsy. They viewed video-clips of a professional actor portraying an urologist. The urologist's statements were representative of statements made by the urologists in our observational study. Men gave consent to participate and clicked a link that randomly assigned them to one of two groups—those who heard their surgeon self-disclose their specialty bias in the video (disclosure group) and those who did not (control/nondisclosure group). The surgeon first explained to the patient that the biopsy revealed localized prostate cancer that was slow growing and the patient could take his time in deciding his treatment. The surgeon went on to describe two treatment options to the patient: surgery and radiation. In the disclosure group, an extra phrase was added after the surgery option was described: *"So that's where my bias lies… Remember, I'm a surgeon so I know more about surgery than radiation*." This phrase was taken verbatim from one of the transcripts from our observational study. The control group had the same video and script excluding this phrase.

After watching the video, the men responded to various questions (Figure S1). First, they indicated which course of action they would take from: 'begin radiation', 'begin surgery', or 'consult a radiation oncologist'. If 'consult a radiation oncologist' was chosen, the men were asked to choose between radiation and surgery based on the information they had.

Nine questions, adapted from Mayer, Davis, & Schoorman's tri-dimensional construct of trust (9) measured, on a Likert scale from 1 (strongly disagree) to 7 (strongly agree), the patient's perceptions of the doctor's *expertise* (this doctor is very capable at performing his job; I feel very confident about this doctor's skills; this doctor is well qualified; Cronbach's $\alpha = .95$), *benevolence* (this doctor is not concerned about my welfare (reverse-coded), would not intentionally hurt me, would go out of his way to help me; Cronbach's $\alpha = .71$), and *integrity* (this doctor has a strong sense of justice, may not stick to his word (reverse-coded), tries hard to be fair; Cronbach's $\alpha = .60$.

Patients also rated how biased they thought their doctor was towards surgery on a scale of 0 (not at all biased) to 100 (extremely biased) and completed other questions.

Supplementary Results

Participants (Table S1b)

There was no difference between the disclosure and nondisclosure groups by participant age, race, education, shared decision-making preferences, prior testing for prostate cancer, or prior diagnosis/treatment for cancer.

Tri-dimensional trust measure (and other questions)

Men in the disclosure group reported higher trust in the doctor's expertise ($M = 5.65$, 95% CI [5.50, 5.79]) than in the nondisclosure group ($M = 5.44$, 95% CI [5.29, 5.59]), $F(1, 434) = 3.77$, $P = .05$, $\eta^2 = .009$. There were no significant differences in the two groups for trust in doctor's benevolence ($M = 5.42$, 95% CI [5.26, 5.57] vs. $M = 5.30$, 95% CI [5.15, 5.45]), *F*(1,

434) = 1.15, P = .28, η^2 = .003) or integrity (M = 4.94, 95% CI [4.80, 5.08] vs. M = 4.94, 95% CI [4.80, 5.08]), F(1, 434) < .001, P = .98, η^2 < .001, nor in believing that the surgeon had their best interests at heart (M = 5.32, 95% CI [5.15, 5.50] vs. M = 5.36, 95% CI [5.19, 5.53]), F(1, 434) = .08, P = .77, η^2 < .001. There was also no difference in the strength of their treatment preference between the disclosure and nondisclosure groups, (M = 3.69, 95% CI [3.55, 3.84] vs. M = 3.54, 95% CI [3.40, 3.69]), F(1, 433) = 2.11, P = .15, η^2 = .005.

Mediation model and analyses

Baron and Kenny recommended a number of steps to establish mediation (10). First, demonstrate that the casual variable (disclosure of specialty bias) is correlated with the outcome (treatment choice) – the c path in Figure 2 (β = .09, t = 2.13, P = .03). Second, show that the causal variable (disclosure) is correlated with the mediator, trust in expertise (β = .21, t = 1.94, P = .05). Third, show that the mediator (trust in expertise) affects the treatment choice while controlling for the causal variable (disclosure), (β = .10, t = 5.30, P < .001). For full mediation, the mediator trust would reduce the effect of disclosure on treatment choice to zero (β = .07, t = 1.68, P = .09), (path c' in Figure 2).

Mediation analyses have become more sophisticated in recent years and the Preacher & Hayes bootstrapping method provides advantages to, and has largely replaced, the former Baron and Kenny mediation step method (11). The bootstrap method is a non-parametric test and as such does not violate assumptions of normality and has increased power over parametric tests. Bootstrapping involves repeatedly randomly sampling observations with replacement from the data set to compute the desired statistic in each resample. Thousands of bootstrap resamples provide an approximation of the sampling distribution of the statistic of interest. Hayes' macro (see http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html) provides a mean point estimate and confidence intervals by which one can assess the significance (determined when zero does not fall between the confidence intervals) or non-significance of a mediation effect.

Mediation of trust in expertise when choosing surgery. In our experiment, in order to test whether patients' trust in the surgeon's expertise explained the relationship between the surgeons' bias disclosure and choosing surgery, we conducted bootstrap analyses using Hayes PROCESS Model 4 for mediation with 5,000 bootstrap samples.

The 95% bias-corrected CIs for the size of the indirect effect for trust in the surgeon's expertise (.10) excluded zero [.01, .22], providing evidence that the patients' trust in the surgeon's expertise explained (mediated) the relationship between the surgeons' self-disclosure of a specialty bias and the patient's decision to choose surgery.

Author contributions

S.S. and P.U. generated the idea and designed the research plan; S.S., A.F., and P.U. performed research; S.S. analyzed data; S.S. wrote the paper; A.F. and P.U. edited the paper.

Additional contributions

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Fig S1: Experimental Survey

Men gave consent to participate at the beginning the survey and demographics were collected at the end.

Based upon the information you have received from your doctor, what course of action would you take.

Begin Radiation	Begin Surgery	Consult a Radiation Oncologist
○	○	○

If you had to choose a treatment right now based on the information you have received, which treatment option would it be?

Radiation	Surgery
○	○

Please indicate the strength of your preference by choosing a point on the scale below.

I am indifferent between radiation and surgery	I slightly prefer the option I chose	I moderately prefer the option I chose	I prefer the option I chose	I greatly prefer the option I chose
○	○	○	○	○

Please indicate the degree to which you agree or disagree with the following statement:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
This doctor has my best interest in mind	○	○	○	○	○	○	○

Please indicate how strongly you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
This doctor is very capable of performing his job.	○	○	○	○	○	○	○
I feel very confident about this doctor's skills.	○	○	○	○	○	○	○
This doctor is well qualified.	○	○	○	○	○	○	○
This doctor is not very concerned about my welfare.	○	○	○	○	○	○	○
This doctor would not intentionally do anything to hurt me.	○	○	○	○	○	○	○
This doctor would go out of his way to help me.	○	○	○	○	○	○	○
This doctor has a strong sense of justice.	○	○	○	○	○	○	○
I wonder whether this doctor will stick to his word.	○	○	○	○	○	○	○
This doctor tries hard to be fair in dealings with others.	○	○	○	○	○	○	○

Do you think that your doctor was biased towards surgery? Please indicate how biased the doctor was on the scale below (0 indicating that the doctor was not biased at all, 100 indicating that the doctor was extremely biased towards surgery).

Treatment Bias **0**

Not at all biased

Extremely Biased

Please respond below with regards to which statement most reflects how you generally handle (or would handle) your medical treatment decisions:

- ◯ My doctor(s) usually make the decision with little input from me
- ◯ My doctor(s) usually make the decision but will seriously consider my opinion
- ◯ My doctor(s) and I usually make the decision together
- ◯ I usually make the decision after seriously considering my doctor(s) opinion
- ◯ I usually make the decision with little input from my doctor(s)

Have you had either a Prostate Specific Antigen (PSA) blood test or Digital Rectal Exam (DRE) completed by your doctor in relation to checking your prostate health?

- ◯ Both PSA and DRE
- ◯ Just the PSA blood test
- ◯ Just the DRE
- ◯ Neither
- ◯ I'm not sure

Have you ever been diagnosed with prostate cancer by a doctor

Yes	No
◯	◯

Have you ever received treatment for cancer?

- ◯ No
- ◯ Yes, radiation
- ◯ Yes, surgery
- ◯ Yes, watchful waiting / active surveillance
- ◯ Other

Table S1a: Characteristics of Patients, Observational Study

	Interactions with no bias statements (nondisclosure group) (*n* = 184)	Interactions with bias statements (disclosure group) (*n* = 35)	*p* value for differences between groups
	Mean (Standard deviation)		[a]*p* value from ANOVA
Age	63.02 (6.25)	62.11 (4.71)	.42[a]
	No. (%)		[b]*p* value from Chi-square test
Race			.18[b]
Caucasian	125 (67.9)	31 (88.6)	
African American	55 (29.9)	4 (11.4)	
Asian	1 (0.5)	0 (0.0)	
Native American	2 (1.1)	0 (0.0)	
Other	1 (0.5)	0 (0.0)	
Education			.82[b]
Some high school, but no diploma	4 (2.2)	0 (0.0)	
High school (Diploma or GED)	51 (27.7)	9 (25.7)	
Trade school	7 (3.8)	2 (5.7)	
Some college, but no degree	63 (34.2)	10 (28.6)	
Associate's degree (AA,AS, etc.)	25 (13.6)	7 (20.0)	
Bachelor's degree (BS, BA, etc.)	24 (13.0)	6 (17.1)	
Master's degree (MA, MPH, etc.)	10 (5.4)	1 (2.9)	
Decision Aid Book randomization			.74[b]
Book 1	95 (51.6)	17 (48.6)	
Book 2	89 (48.4)	18 (51.4)	
Shared decision-making			
My doctor(s) will make the decision with little input from me	2 (1.1)	0 (0.0)	.47[b]
My doctor(s) will make the decision but will seriously consider my opinion	13 (7.1)	0 (0.0)	
My doctor(s) and I will make the decision together	85 (46.2)	17 (48.6)	
I will make the decision after seriously considering my doctor(s) opinion	82 (44.6)	18 (51.4)	
I will make the decision with little input from my doctor(s)	2 (1.1)	0 (0.0)	

Preferred treatment choice prior to diagnosis			
Surgery	23 (12.5)	6 (17.1)	.57[b]
Other treatment	127 (69.0)	21 (60.0)	
Missing	34 (18.5)	8 (22.9)	
Clinical stage of disease			.66[b]
T1	104 (56.5)	18 (51.4)	
T2	46 (25.0)	12 (34.3)	
T3	2 (1.1)	1 (2.9)	
Missing	32 (17.4)	6 (17.1)	
Final treatment decision			< .001[b]
Surgery	47 (25.5)	25 (71.4)	
External beam radiation	33 (17.9)	3 (8.6)	
Brachytherapy	4 (2.2)	1 (2.9)	
Other, e.g., hormone or experimental therapies	4 (2.2)	1 (2.9)	
Active surveillance	96 (52.2)	5 (14.3)	

Table S1b: Characteristics of Participants, Randomized Experiment

	Nondisclosure group (n = 224)	Disclosure group (n = 223)	p value for differences between groups
	Mean (Standard deviation)		[a]p value from ANOVA
Age	67.53 (6.73)	66.69 (6.44)	.19[a]
	No. (%)		[b]p value from Chi-square test
Race			.49[b]
Caucasian	176 (78.6)	173 (77.6)	
African American	30 (13.4)	35 (15.7)	
Asian	3 (1.3)	1 (0.4)	
Native American	1 (0.4)	4 (1.8)	
Other	3 (1.3)	1 (0.4)	
Missing	11 (4.9)	9 (4.0)	
Education			.21[b]
Less than High School	3 (1.3)	1 (0.4)	
High school / GED	26 (11.6)	31 (13.9)	
Some college	68 (30.4)	50 (22.4)	
College degree	76 (33.9)	96 (43.0)	
Master's degree and above	27 (12.1)	28 (12.6)	
Doctoral degree	4 (1.8)	3 (1.3)	
Professional degree (JD, MD)	12 (5.4)	5 (2.2)	
Missing	8 (3.6)	9 (4.0)	

Shared decision-making			.78[b]
My doctor(s) usually make the decision with little input from me	3 (1.3)	3 (1.3)	
My doctor(s) usually make the decision but will seriously consider my opinion	27 (12.1)	32 (14.3)	
My doctor(s) and I usually make the decision together	110 (49.1)	101 (45.3)	
I usually make the decision after seriously considering my doctor(s) opinion	72 (33.1)	76 (34.1)	
I usually make the decision with little input from my doctor(s)	5 (2.2)	2 (0.9)	
Missing	7 (3.1)	9 (4.0)	
Prior Prostate Specific Antigen (PSA) or Digital Rectal Exam (DRE)			.97[b]
Both PSA and DRE	115 (51.3%)	118 (52.9%)	
Just the PSA blood test	51 (22.8%)	50 (22.4%)	
Just the DRE	11 (4.9%)	10 (4.5%)	
Neither	26 (11.6%)	21 (9.4%)	
Not sure	14 (6.3%)	15 (6.7%)	
Missing	7 (3.1)	9 (4.0)	
Prior diagnosis of prostate cancer			.37[b]
Yes	18 (8.0)	26 (11.7)	
No	199 (88.8)	188 (84.3)	
Missing	7 (3.1)	9 (4.0)	
Prior treatment for cancer			.74[b]
None	181 (80.8)	174 (78.0)	
Radiation	9 (4.0)	6 (2.7)	
Surgery	21 (9.4)	27 (12.1)	
Watchful waiting / active surveillance	0 (0.0)	1 (0.4)	
Other	6 (2.7)	6 (2.7)	
Missing	7 (3.1)	9 (4.0)	
Initial choice			.31[b]
Consult with a radiation oncologist	119 (53.1)	113 (50.7)	
Begin surgery	95 (42.4)	105 (47.1)	
Begin radiation	10 (4.5)	5 (2.2)	
Final Treatment choice			.03[b]
Surgery	145 (64.7)	165 (74.0)	
Radiation	79 (35.3)	58 (26.0)	

Table S2: Correlations among main variables, Observational study

	Presence of bias statement	Strength of surgery recommendation	Strength of radiation recommendation	Strength of active surveillance recommendation	Discussion of meeting radiation oncologist	Age of patient
Had surgery	.36**	.48**	.02	.39**	.47**	-.24**
Presence of bias statement	-	.37**	-.06	.27**	.02	-.06
Strength of surgery recommendation		-	-.17*	.33**	.37**	-.25**
Strength of radiation recommendation			-	.21**	-.04	.11
Strength of active surveillance recommendation				-	.24**	-.17*
Discussion of meeting radiation oncologist					-	-.18**

Note: *$P < .05$, **$P < .01$

Table S3: Physician-patient interaction, Observational Study

	Interactions with no bias statements (nondisclosure group) (*n* = 184)	Interactions with bias statements (disclosure group) (*n* = 35)	*p* value for differences between groups
	No. (%)		*p* value from Chi-square test
Strength of surgery recommendation			< .001
-2 (recommended against)	19 (10.3)	0 (0.0)	
-1	9 (4.9)	0 (0.0)	
0 (neither for nor against)	120 (65.2)	7 (20.0)	
1	12 (6.5)	18 (51.4)	
2 (recommended for)	22 (12.0)	10 (28.6)	
Missing	2 (1.1)	0 (0.0)	
Strength of radiation recommendation			.54
-2 (recommended against)	8 (4.3)	1 (2.9)	
-1	11 (6.0)	2 (5.7)	
0 (neither for nor against)	147 (79.9)	32 (91.4)	
1	7 (3.8)	0 (0.0)	
2 (recommended for)	9 (4.9)	0 (0.0)	
Missing	2 (1.1)	0 (0.0)	
Strength of active surveillance recommendation			.001
-2 (recommended against)	27 (14.7)	1 (2.9)	
-1	18 (9.8)	2 (5.7)	
0 (neither for nor against)	61 (33.2)	4 (11.4)	
1	15 (8.2)	3 (8.6)	
2 (recommended for)	61 (33.2)	25 (71.4)	
Missing	2 (1.1)	0 (0.0)	
Radiation oncologist appointment			.78
Discussed	32 (17.4)	7 (20.0)	
Not discussed	150 (81.5)	28 (80.0)	
Missing	2 (1.1)	0 (0.0)	

Table S4: Regression results of the likelihood to have surgery, Observational Study.

Predictor	*Relative Risk* *95% Confidence Interval [lower bound, upper bound]*		
	Model 1	*Model 2*	*Model 3*
Presence of explicit bias statement	2.29*** [1.70, 3.07]	1.89** [1.26, 2.84]	1.69** [1.13, 2.53]
Age		0.95*** [0.92, 0.98]	0.97 [0.94, 1.01]
Race: Caucasian		1.42 [0.82, 2.48]	1.22 [0.75, 1.97]
Education		0.93 [0.82, 1.06]	0.92 [0.83, 1.02]
Decision aid		0.74 [0.45, 1.22]	0.91 [0.47 1.78]
Stage T3		4.07*** [1.87, 8.86]	3.31** [1.45, 7.55]
Stage T2		1.81** [1.23, 2.68]	1.44 [0.97, 2.15]
Shared decision-making		0.83 [0.50, 1.38]	0.93 [0.58, 1.48]
Surgery preferred treatment choice prior to diagnosis		1.15 [0.77, 1.71]	1.24 [0.85, 1.83]
Strength of recommendation to have surgery			1.49** [1.11, 1.99]
Strength of recommendation to have radiation			1.17 [0.66, 2.11]
Strength of recommendation to have active surveillance			1.16 [0.91, 1.47]
Radiation oncologist discussed			1.78* [1.01, 3.13]
Constant	-1.26***	2.50*	0.30
Corrected Quasi Likelihood under Independence Model Criterion QICC (Goodness of Fit)	156.34	106.48	98.37

Note: Models are clustered by doctor and have robust standard errors.
*$P \leq .05$, **$P \leq .01$, ***$P \leq .001$.