Decisional Quality Among Patients Making Treatment Decisions for Urolithiasis

John N. Cabri, Christopher S. Saigal, Sylvia Lambrechts, Adam P. Peña, Casey Weiser, Hui Liu, Lorna Kwan, and Matthew E. Pollard

OBJECTIVE To measure decisional quality, physician loyalty, and treatment preference in patients diagnosed with urolithiasis, a "preference-sensitive" condition, to identify areas of improvement to be addressed by a targeted shared decision-making intervention.

METHODS We identified patients who presented for an initial consultation for urolithiasis from March 2016 to May 2017. Patients completed a 24-item patient experience questionnaire after the consultation which assessed decisional quality domains, physician loyalty, and treatment preference. We summarized treatment preferences before and after the consultation and described the changes.

RESULTS Among the total of 113 patients who met inclusion criteria, 78 (69%) patients chose to participate. Thirty-six (46%) of those patients had evidence of decisional conflict and 42 (54%) did not. Only 1 in 5 patients experiencing decisional conflict reported knowing the benefits and risks of each treatment option. Patients with decisional conflict reported lower perceived shared decision-making, treatment satisfaction, and urolithiasis knowledge. Physician loyalty was lower among patients with decisional conflict as well. Thirty-nine percent of them were 'Promoters' of their urologist, compared to 71% of patients without decisional conflict. Sixty-four percent of patients without decisional conflict identified a treatment preference before consultation, while only 17% of patients who experienced decisional conflict were able to do so.

CONCLUSION Many patients with urolithiasis experience decisional conflict and are unsure of their preferences when making a treatment choice. Uncertainty can correlate with low physician loyalty after consultation. This population may benefit from a shared decision-making intervention that improves decisional quality while incorporating patient-specific preferences. UROLOGY 133: 109–115, 2019. © 2019 Elsevier Inc.

Urolithiasis meets the definition of a "preference-sensitive" condition; a patient with an uncomplicated stone diagnosis can choose from several treatment options, including medical expulsive therapy, noninvasive extracorporeal shock wave lithotripsy (ESWL), and invasive ureteroscopy (URS) with laser lithotripsy.[1] Patients have different relative preferences for the risks and benefits of each of these approaches, which play an important role in selecting the optimal treatment. "Shared decision-making" (SDM) is a process which leverages physician experience, clinical data, and patient preference data, and it is advocated by the American Urological Association, Affordable Care Act, and others in this setting.[2-4] As the prevalence of urolithiasis grows,[5] with a current incidence estimate of 63.1 cases per 100,000 US population,[6] it will become increasingly important to utilize a patient-centered approach to treatment choice.

Existing work has documented key factors driving decision-making in patients with urolithiasis. Patients generally prefer surgical treatment to conservative observation for both symptomatic and asymptomatic stones.[7] Data has shown that patients prefer ESWL to URS despite the increased risk of a repeat stone removal procedure,[7] and patients who underwent prior ESWL were almost 50% more likely to choose the same procedure for recurrent urolithiasis than patients who underwent URS.[8] The most important factors influencing treatment decisions in this patient population include success rates, necessity of a postoperative ureteral stent, surgical risk, and prior surgical experience.[7]

Patient preference assessment and SDM may not be widely adopted in urolithiasis decision-making. Over half of urolithiasis patients have been shown to defer treatment

Funding: *This project received no outside funding or support.*
Conflict of Interests: *The authors have no actual or potential conflicts of interest in relation to this project or publication.*
Financial Disclosures: *The authors declare that they have no relevant financial interests.*

From the The David Geffen School of Medicine at UCLA, Los Angeles, CA; and the UCLA Department of Urology, Los Angeles, CA
Address correspondence to: John N. Cabri, B.S., 1223 26th St, Apt A, Santa Monica, CA 90404. E-mail: jcabri@mednet.ucla.edu

Submitted: March 20, 2019, accepted (with revisions): July 22, 2019

choice to the physician.[7] Though this can be appropriate if patients delegate this role, studies have shown that patients' preferences tend toward joint decision-making in surgical settings.[9,10] Provider characteristics and preferences for specific treatments may influence patient treatment choice at the expense of considering patient preferences.[11] As the push toward patient-centered care and personalized medicine grows, patient education and SDM may offer ways to incorporate patient values and goals into treatment choices for urolithiasis management.

Researchers in the field have defined the concept of "decisional quality" to evaluate the patient-physician interaction regarding treatment.[12] Decisional quality is comprised of several measures including decisional conflict, disease-specific knowledge, patient satisfaction, and perception that SDM occurred during consultation. Decisional conflict, defined as personal uncertainty when choice among competing options involves risk, regret, or challenge to personal life values,[13] has been shown to decrease by improving disease-specific knowledge and increasing patient participation through informative SDM.[14,15] When SDM is employed, patients experience increased sense of engagement in the treatment process, satisfaction, and adherence to their treatment choice and health-promoting behaviors.[15-18] Patient uncertainty has been associated with patients delaying or failing to implement their treatment decisions, changing their minds, blaming their providers for bad outcomes, and expressing decisional regret.[19,20]

Little is known about decisional quality among urolithiasis patients. Only 1 prior study has looked at SDM in the setting of urolithiasis, but sought to explain why patients select specific treatment options.[21] No prior work has investigated decisional quality and the relationship between decisional conflict and patient knowledge, treatment satisfaction, and perceived SDM in patients with urolithiasis.

We aimed to evaluate decisional quality in patients diagnosed with urolithiasis to identify modifiable targets for future quality improvement (QI) efforts in this area. The objectives of this QI project were to assess: (1) if, after physician counseling, patients with evidence of decisional conflict would exhibit lower disease-specific knowledge and would have lower perceived SDM from their encounter than patients without evidence of decisional conflict, and; (2) if the absence of decisional conflict would be associated with a measurable, positive effect on a patient's healthcare experience and physician loyalty.

MATERIAL AND METHODS

Identification of Patients

From March 2016 to May 2017, we identified a convenience sample of patients within a large academic clinical setting (UCLA Department of Urology) who were scheduled for an initial consultation for urolithiasis management. Patients included any adult scheduled for a kidney stone consultation who was symptomatic or asymptomatic for urolithiasis and had imaging (X-Ray, CT, or ultrasound) confirming urolithiasis, 2 functioning kidneys, and the ability to read and speak English. Patients who had undergone prior treatment for their current stone or who had passed the stone prior to the visit were excluded. Patients were also excluded if they were pregnant or febrile, which would suggest complicating pyelonephritis. Patients completed a postconsultation survey that was administered by project coordinators not known to the patients in person or by phone within 1 month following their consultation visit and prior to their next clinic follow-up. Patients were informed their responses would not be shared with the consulting urologist.

We designed our project according to the Standards for QI Reporting Excellence guidelines for QI projects.[22] Our results and findings are reported in line with Standards for QI Reporting Excellence standards. This QI project was also reviewed by the Institutional Review Board and determined to be exempt from its design and reporting standards.

Decisional Quality Domains

We administered a 24-item patient experience questionnaire of validated instruments and selected other items to address the domains of decisional conflict, SDM, patient satisfaction, urolithiasis knowledge, and health literacy. We had to edit these instruments for brevity to reduce respondent burden and loss of participation, as these were collected as part of routine care. We included items in the questionnaire with the highest face validity related to our QI aims. The survey also queried patients about physician loyalty and urolithiasis treatment preference.

Decisional Conflict. We used the 4-item SURE Test for Clinical Practice to detect decisional conflict regarding treatment choice. This validated scale was designed to screen for evidence of decisional conflict,[23] which can be measured in greater detail, if needed, using the much longer 16-item Decisional Conflict Scale.[19] SURE has been used in a variety of patient populations, including those facing other urologic treatment decisions.[13,14] Patients responded 'Yes' or 'No' to each of the 4 items, and a total score was the sum of yes responses across the items. Patients who responded 'Yes' to all 4 questions (SURE = 4) demonstrated no evidence of decisional conflict while those who responded 'No' to 1 or more of the questions (SURE $\leq$3) had evidence of decisional conflict. We also compared patient responses to each of the individual SURE test items.

Shared Decision-making. We used 2 items from the validated SDM Questionnaire to assess patient perception that SDM occurred during the consultation.[24] Patients responded on a 5-point Likert scale from 1 ('Strongly Agree') to 5 ('Strongly Disagree'). A lower score indicates greater perception that SDM occurred during the consultation.

Patient Satisfaction. We measured patient satisfaction and likelihood to stick with treatment choice using 3 items from the Service Satisfaction Scale for Cancer Care.[25] Patients responded on a 5-point Likert scale from 1 ('Yes') to 5 ('No'), where a lower score indicates higher satisfaction.

Urolithiasis Knowledge. We evaluated patients' urolithiasis knowledge by administering a 10-item true-false questionnaire developed by a panel of experts in urolithiasis and educational assessment. This questionnaire samples knowledge domains of urolithiasis pathogenesis, diagnosis, and treatment, including

options, outcomes, and side effects. We summed the number of questions patients answered correctly.

Physician Loyalty. We used the validated Net Promoter Score to evaluate the patient's willingness to refer a friend or family member to the urologist with whom they received their care and to the institution where they received their care.[26] Patients responded by selecting on an ordinal scale from 0 to 10 to indicate how likely they would be to make the referrals, with 10 being the most likely. Patients were categorized as a 'Detractor' (score 0-6), 'Passive' (score 7-8), or 'Promoter' (score 9-10). The Net Promoter Score was calculated for groups by subtracting the percentage of 'Detractors' from the percentage of 'Promoters'. With a range of −100 to +100, a "positive" score, or NPS above 0, is considered acceptable, +50 is excellent, and +70 is considered exceptional. For reference, in 2017, Apple had an NPS of 72, while United Airlines' NPS was 10.

Health Literacy. We assessed health literacy with a single, validated question to query the patient's self-rated confidence in filling out medical forms.[27] Patients responded on a 5-point Likert scale from 1 ('All of the Time') to 5 ('None of the Time') where 'All of the Time' indicated the highest health literacy.

Treatment Preference. We evaluated treatment preferences after the consultation and asked patients to recall their preferences prior to consultation. Patients made a single choice from a list of treatment options for urolithiasis, including observation ('Trying to pass the stone on your own'), medical expulsion therapy ('Oral medication to help you pass your stone'), invasive procedures ('Shock wave treatment' or 'Ureteroscopy with laser lithotripsy'), as well as options for 'Other' and 'Unsure.'

Statistical Analysis

We performed univariate analysis to evaluate associations of cohort characteristics and decisional quality with decisional conflict. We used Student's *t* test, chi-square (or Fisher's exact, if necessary), and median tests to compare differences between patients with (SURE ≤3) and without (SURE = 4) evidence of decisional conflict for patient demographics and each domain of the survey. We summarized treatment preferences before and after consultation and described changes in preference. We set alpha at 0.05 to determine statistical significance. All analyses were performed in SAS 9.4 and R 3.4.2.

RESULTS

Patient Characteristics

A total of 113 patients were eligible for participation. Of those, 78 (69%) completed every item on the postconsultation questionnaire. Seven patients declined to participate, and 28 were unreachable. All 78 participating patients were asymptomatic at the time of completing the questionnaire and had not yet undergone surgical intervention. The patients had a mean age of 52.1 years (SD = 15.8), and the majority were male (64%), Non-Hispanic white (68%), in a relationship (63%), and employed (67%) (Table 1). Six urologists saw the 78 patients included in this project, and their contributions ranged from 1 consultation to 30 (Table 2). The distribution of each decisional quality domain did not differ across patients seen by the different urologists (Fisher's exact *P* range .1096-.9851; data not shown).

Decisional Conflict and Domains of Decisional Quality

Among the 78 participating patients, 36 (46%) had evidence of decisional conflict and 42 (54%) did not (Table 1). There were no demographic differences, including gender, between patients with and without evidence of decisional conflict (Table 1). Among patients with evidence of decisional conflict, only 1 in 5 felt they knew the benefits and risks for each treatment, and only half felt sure about their treatment choice or had support to make a choice (Table 3). Patients without decisional conflict were more likely to believe SDM occurred during their

Table 1. Patient demographics, overall and grouped by evidence of decisional conflict

	Total (*n* = 78)	No Evidence of Decisional Conflict (SURE = 4) (*n* = 42)	Evidence of Decisional Conflict (SURE ≤ 3) (*n* = 36)	*P*
Age				
Mean (SD)	52.1 (15.8)	52.1 (15.9)	52.0 (15.9)	.9909
Median (range)	55.8 (20.4, 77.9)	56.3 (20.4, 77.9)	55.1 (20.8, 77.6)	
Gender				
Female	36% (28)	29% (12)	44% (16)	.1452
Male	64% (50)	71% (30)	56% (20)	
Race				
Non-Hispanic white	68% (53)	74% (31)	61% (22)	.0796*
Hispanic	6% (5)	5% (2)	8% (3)	
African American	1% (1)	2% (1)	0% (0)	
Asian	6% (5)	0% (0)	14% (5)	
Other†	18% (14)	19% (8)	17% (6)	
Relationship status				
Not in a relationship	37% (29)	43% (18)	31% (11)	.2624
In a relationship	63% (49)	57% (24)	69% (25)	
Employment status				
Not employed	32% (25)	29% (12)	36% (13)	.7117*
Employed	67% (52)	69% (29)	64% (23)	
Unknown	1% (1)	2% (1)	0% (0)	

* Fisher's exact test.
† "Other" includes other races, "refused," and "unknown."

Table 2. Deidentified urologist participation in patient consultations ($n = 78$)

Urologist	Number of Consultations	% of Total Consultations
A	1	1.3
B	6	7.6
C	6	7.6
D	8	10.1
E	27	34.2
F	30	38.0

consultation than those with decisional conflict. They reported discussing treatment options with their doctor and feeling included in the treatment decision (95% vs 39%, $P < .0001$; 100% vs 72%, $P = .0002$, respectively) (Table 3). Moreover, these patients felt they knew about available treatment options (100% vs 58%, $P < .0001$), expected to stick with their decision (100% vs 78%, $P = .0013$), and had greater treatment choice satisfaction (100% vs 69%, $P = .0001$).

Patients had high urolithiasis knowledge and scored well on the knowledge questionnaire. Patients without decisional conflict, compared to those with decisional conflict, had a higher median knowledge score (9.0 vs 8.0, $P = .0150$) and knew drinking too little water could cause urolithiasis (100% vs 83%, $P = .0076$) (Table 3).

Patients without decisional conflict were also more likely to be a 'Promoter' of their urologist than those with decisional conflict (71% vs 39%, $P = .0004$) (Table 3), and the Net Promoter Score between these two groups was 69 vs. 6. There were no significant differences between the two groups in loyalty to the healthcare institution and health literacy.

Patients without evidence of decisional conflict were more likely to identify a treatment preference prior to the urologic consultation than those with evidence of decisional conflict (64% vs 17%, $P < .0001$), but there was no difference after seeing the urologist (Table 3). Moreover, patients without decisional conflict were less likely to switch their treatment preference from their initial option than those with decisional conflict (55% vs 92%, $P = .0003$).

Overall, 33 (42%) of the patients were able to identify a treatment choice before their urologic consultation. Eighteen chose an invasive procedure, 11 chose medical expulsion therapy or observation, and 4 chose other interventions (Table 4). After the consultation, 3 of those 33 (9%) patients became unsure. Of the remaining 30, 9 changed their treatment preference; 2 chose a more invasive procedure, and three chose a less invasive procedure (data not shown).

Among the 45 patients (58%) who did not identify a treatment preference before seeing the urologist (Table 4), 44 (96%) were able to identify a preference after their consultation. Twenty of those patients chose an invasive procedure, 22 chose medical expulsion therapy or observation, and 2 chose other interventions.

COMMENT

Our work had several important findings that characterize the state of decisional quality among patients with urolithiasis, many of which are novel and not previously documented in the literature. First, we found that nearly half of patients with urolithiasis exhibited evidence of decisional conflict after consultation with a urologist. Having decisional conflict was associated with lower urolithiasis knowledge, SDM scores, and treatment satisfaction, presenting an important opportunity for urologists to intervene and improve urolithiasis patient decision-making. Given the relationship we identified between decisional conflict and low scores in other domains of decisional quality, patients with urolithiasis may benefit from interventions that aim to improve these areas of decision-making.

Second, we found that urolithiasis patients with evidence of decisional conflict scored lower in 3 domains of decisional quality: disease-specific knowledge, treatment satisfaction, and perceived SDM. These findings, while novel in the setting of urolithiasis, have been described in other conditions including prostate cancer and female breast cancer.[14,28] Urolithiasis patients may therefore benefit from interventions that enhance patient knowledge and involvement in decision-making.

Third, we report the novel finding that urolithiasis patients who have evidence of decisional conflict demonstrate far lower physician loyalty than patients without decisional conflict. Given the importance of patient satisfaction and the impact of physician reviews, reductions in decisional conflict may also serve to enhance the viability of the urology practice itself.[29] Interventions that reduce decisional conflict and promote SDM may also have the benefit of improving physician loyalty. Given that "provider motivation" is one of the known facilitators of SDM, the physician benefits of SDM deserve greater attention.[30]

The findings in our project should be interpreted within the context of several limitations. Our project took place at a single, large academic institution and our patient population was relatively homogeneous. It is largely comprised of individuals who tend to be insured and well-educated. Though we found no differences in the demographic composition of patients, our findings may not be generalizable to other patient populations or care models.

Our project was also limited by patient participation. Though we aimed to limit responder burden on the post-consultation survey, 35 patients (31%) of the 113 eligible either refused to complete the survey or were unreachable within 1 month following consultation.

Patients who completed the questionnaire more recently after their consultation may have responded differently than patients who were not reached until later, possibly introducing recall bias. We selected to collect patient responses up to 1 month after consultation based on prior experiences with similar projects in which sample sizes were limited by shorter response windows. This may decrease the reliability of some measures in our questionnaire. The Decisional Conflict Scale and Service Satisfaction for Cancer Scale found test-retest reliability coefficients of 0.81 and 0.77, respectively, at 2 weeks.[19,25] The studies validating the SDM Questionnaire, SURE, and Net Promoter Score did not measure test-retest reliability.

Additionally, we did not analyze patient outcomes with respect to consulting urologist. The purpose of this QI project was to evaluate the patient experience and

Table 3. Summary statistics for individual decisional quality domains, grouped by evidence of decisional conflict

	No Evidence of Decisional Conflict (SURE = 4) (n = 42)	Evidence of Decisional Conflict (SURE ≤3) (n = 36)	P
Decisional conflict			
SURE total, mean (SD)		1.7 (1.1)	
Feel sure about best choice, % yes		50% (18)	
Know the benefits/risks of each treatment, % yes		19% (7)	
Clear about benefits/risks matter most, % yes		53% (19)	
Have support/advice to make a choice, % yes		50% (18)	
Shared decision-making			
Discuss options with doctor			
Agree	95% (40)	39% (14)	**<.0001***
Neither	2% (1)	25% (9)	
Disagree	2% (1)	36% (13)	
Felt included in decision			
Agree	100% (42)	72% (26)	**.0002***
Neither	0% (0)	14% (5)	
Disagree	0% (0)	14% (5)	
Patient satisfaction			
Know treatment options			
Yes/probably yes	100% (42)	58% (21)	**<.0001***
Unsure	0% (0)	17% (6)	
No/probably no	0% (0)	25% (9)	
Expect to stick with your decision			
Yes/probably yes	100% (42)	78% (28)	**.0013***
Unsure	0% (0)	17% (6)	
No/probably no	0% (0)	6% (2)	
Satisfied with your decision			
Yes/probably yes	100% (42)	69% (25)	**.0001***
Unsure	0% (0)	19% (7)	
No/probably no	0% (0)	11% (4)	
Urolithiasis knowledge, # correct, median (IQR)	9.0 (8.0, 9.0)	8.0 (7.0, 9.0)	**.0150**†
Stones from crystalized chemical/minerals, % correct	88% (37)	78% (28)	.2422*
Drinking too little water causes stones, % correct	100% (42)	83% (30)	**.0076***
Stones require surgical treatment, % correct	98% (41)	92% (33)	.3300*
Obesity is a risk factor, % correct	45% (19)	39% (14)	.5715
CT scan used for diagnosis, % correct	90% (38)	86% (31)	.7252*
Medication can help stones pass, % correct	79% (33)	72% (26)	.5149
Shock waves can break apart stones, % correct	93% (39)	84% (31)	.2885*
Surgery can involve small scopes and laser, % correct	93% (39)	92% (33)	>.9999*
Having 1 stone increases likelihood of another, % correct	90% (38)	72% (26)	**.0434***
Dietary and/or lifestyle changes can reduce risk, % correct	100% (42)	86% (31)	**.0179***
Net promoter, physician			
Promoter (9-10)	71% (29)	39% (14)	**.0004***
Passive (7-8)	27% (11)	28% (10)	
Detractor (0-6)	2% (1)	33% (12)	
Net promoter score (% promoter − % detractor)	69	6	
Net promoter, institution			
Promoter (9-10)	71% (30)	64% (23)	.3922*
Passive (7-8)	24% (10)	22% (8)	
Detractor (0-6)	5% (2)	14% (5)	
Net promoter score (% promoter − % detractor)	66	50	
Health literacy			
Adequate	100% (42)	97% (35)	.4615*
Marginal	0% (0)	3% (1)	
Inadequate	0% (0)	0% (0)	
Identified treatment preference *before* consultation	64% (27)	17% (6)	**<.0001**
Identified treatment preference *after* consultation	98% (41)	92% (33)	.3300*
Changed treatment preference after consultation (% yes)	55% (23)	92% (33)	**.0003***

Bold p-values are significant at the pre-set alpha of 0.05.
* Fisher's exact test.
† Median test.

decisional quality among urolithiasis patients without intervening in routine care practices. The techniques used by our urologists to educate their patients and support treatment decision-making were not standardized and likely led to heterogeneous patient experiences. This raises the hypothesis that standardizing educational SDM

Table 4. Patient treatment preferences by procedure type before and after consultation ($n = 78$)

	Before Consultation	After Consultation
Treatment preference		
Invasive procedure (ESWL and URS)	23% (18)	46% (36)
Medical expulsion therapy	6% (5)	28% (22)
Observation	8% (6)	17% (13)
Other	5% (4)	4% (3)
Unsure	58% (45)	5% (4)

for patients with urolithiasis may reduce interphysician differences and homogenize the patient experience.

We designed this as a QI project and collected data as part of routine care, so we did not control for patients' incoming treatment preferences or urolithiasis knowledge. Patients without decisional conflict were nearly 50% more likely to identify a preconsultation treatment preference than those with decisional conflict, which may have been influenced by us soliciting this information after consultation. Literature on this topic is lacking, and, following consultation, patients with no decisional conflict may have responded differently about their preconsultation preferences than those with decisional conflict. We also did not determine patients' incoming urolithiasis knowledge, a domain which may have been affected by prior history of urolithiasis, patient-directed research, or the consulting urologist. Our aim, however, was to assess post-consultation knowledge, regardless of the source from which that knowledge was obtained.

The above findings describe the current state of decisional quality among urolithiasis patients and we demonstrate a need for improvement in treatment decision-making in this patient population. Many urolithiasis patients are unsure about treatment preference, experience decisional conflict, and have low disease-specific knowledge, treatment satisfaction, and perceived SDM during consultation. These all contribute to lowered decisional quality and may result in worse clinical outcomes and increased regret. Urologists may be further inspired to improve this metric by the low physician loyalty among this group of patients. We specifically raise the hypothesis that addressing modifiable domains of urolithiasis patient decision-making may directly impact SURE scores (decisional conflict) and decisional quality. These findings establish a clear opportunity to introduce interventions that incorporate patient preference and promote SDM to improve decisional quality among urolithiasis patients and thus enhance the patient experience.

CONCLUSION

Patients seeking care for urolithiasis often exhibit decisional conflict after making a treatment decision. These patients are often unsure of their treatment preferences prior to consultation and demonstrate lower disease-specific knowledge, treatment satisfaction, and perceived SDM. They also exhibit low physician loyalty after consultation. These factors reduce decisional quality and may impair treatment outcomes. Future QI work should aim to address urolithiasis patient needs by implementing interventions that improve decisional quality, align patient preferences with their treatment choice, and improve the patient experience.

References

1. Preminger GM, Tiselius HG, Assimos DG, et al. 2007 guideline for the management of ureteral calculi. *J Urol*. 2007;178:2418–2434. https://doi.org/10.1016/j.juro.2007.09.107.
2. Beneficiary engagement and incentives models: shared decision making model. https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2016-Fact-sheets-items/2016-12-08-2.html . Published December 8, 2016.
3. Makarov DV, Fagerlin A, Chrouser K, et al. AUA white paper on implementation of shared decision making into urological practice. *AUA 2016 Qual Improv Summit Proc*. October 2015. http://www.auanet.org/guidelines/shared-decision-making.
4. Oshima Lee E, Emanuel EJ. Shared decision making to improve care and reduce costs. *N Engl J Med*. 2013;368:6–8. https://doi.org/10.1056/NEJMp1209500.
5. Scales CD, Smith AC, Hanley JM, Saigal CS. Prevalence of kidney stones in the United States. *Eur Urol*. 2012;62:160–165. https://doi.org/10.1016/j.eururo.2012.03.052.
6. Scales CD, Curtis LH, Norris RD, et al. Changing gender prevalence of stone disease. *J Urol*. 2007;177:979–982. https://doi.org/10.1016/j.juro.2006.10.069.
7. Sarkissian C, Noble M, Li J, Monga M. Patient decision making for asymptomatic renal calculi: balancing benefit and risk. *Urology*. 2013;81:236–240. https://doi.org/10.1016/j.urology.2012.10.032.
8. Pearle MS, Lingeman JE, Leveillee R, et al. Prospective, randomized trial comparing shock wave lithotripsy and ureteroscopy for lower pole caliceal calculi 1 cm or less. *J Urol*. 2005;173:2005–2009. https://doi.org/10.1097/01.ju.0000158458.51706.56.
9. Ramfelt E, Lützen K, Nordström G. Treatment decision-making in a group of patients with colo-rectal cancer before surgery and a one-year follow-up. *Eur J Cancer Care*. 2005;14:327–335. https://doi.org/10.1111/j.1365-2354.2005.00588.x.
10. Ankuda CK, Block SD, Cooper Z, et al. Measuring critical deficits in shared decision making before elective surgery. *Patient Educ Couns*. 2014;94:328–333. https://doi.org/10.1016/j.pec.2013.11.013.
11. Scales CD, Krupski TL, Curtis LH, et al. Practice variation in the surgical management of urinary lithiasis. *J Urol*. 2011;186:146–150. https://doi.org/10.1016/j.juro.2011.03.018.
12. Sepucha K, Ozanne E, Silvia K, Partridge A, Mulley AG. An approach to measuring the quality of breast cancer decisions. *Patient Educ Couns*. 2007;65:261–269. https://doi.org/10.1016/j.pec.2006.08.007.
13. Légaré F, Kearing S, Clay K, et al. Are you SURE?: assessing patient decisional conflict with a 4-item screening test. *Can Fam Physician*. 2010;56:e308–e314. http://www.ncbi.nlm.nih.gov/pubmed/20705870.
14. Kaplan AL, Crespi CM, Saucedo JD, Connor SE, Litwin MS, Saigal CS. Decisional conflict in economically disadvantaged men with newly diagnosed prostate cancer: baseline results from a shared decision-making trial. *Cancer*. 2014;120:2721–2727. https://doi.org/10.1002/cncr.28755.
15. Shirk JD, Crespi CM, Saucedo J, et al. Does patient preference measurement in decision aids improve decisional conflict? A randomized trial in men with prostate cancer. *Patient*. 2017. https://doi.org/10.1007/s40271-017-0255-7.
16. Joosten EAG, DeFuentes-Merillas L, de Weert GH, Sensky T, van der Staak CPF, de Jong CAJ. Systematic review of the effects of shared decision-making on patient satisfaction, treatment adherence

and health status. *Psychother Psychosom*. 2008;77:219–226. https://doi.org/10.1159/000126073.
17. Johnson DC, Mueller DE, Deal AM, et al. Integrating patient preference into treatment decisions for men with prostate cancer at the point of care. *J Urol*. 2016;196:1640–1644. https://doi.org/10.1016/j.juro.2016.06.082.
18. Stacey D, Légaré F, Col NF, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane Database Syst Rev*. 2014; CD001431. https://doi.org/10.1002/14651858.CD001431.pub4.
19. O'Connor AM. Validation of a decisional conflict scale. *Med Decis Mak*. 1995;15:25–30. https://doi.org/10.1177/0272989X9501500105.
20. Gattellari M, Ward JE. Will men attribute fault to their GP for adverse effects arising from controversial screening tests? An Australian study using scenarios about PSA screening. *J Med Screen*. 2004;11:165–169. https://doi.org/10.1258/0969141042467386.
21. Omar M, Tarplin S, Brown R, Sivalingam S, Monga M. Shared decision making: why do patients choose ureteroscopy? *Urolithiasis*. 2016;44:167–172. https://doi.org/10.1007/s00240-015-0806-0.
22. Ogrinc G, Davies L, Goodman D, Batalden P, Davidoff F, Stevens D. SQUIRE 2.0 (standards for quality improvement reporting excellence): revised publication guidelines from a detailed consensus process. *Jt Comm J Qual Patient Saf*. 2015;41:474–479.
23. Ferron Parayre A, Labrecque M, Rousseau M, Turcotte S, Légaré F. Validation of SURE, a four-item clinical checklist for detecting decisional conflict in patients. *Med Decis Mak*. 2014;34:54–62. https://doi.org/10.1177/0272989X13491463.
24. Simon D, Schorr G, Wirtz M, et al. Development and first validation of the shared decision-making questionnaire (SDM-Q). *Patient Educ Couns*. 2006;63:319–327. https://doi.org/10.1016/j.pec.2006.04.012.
25. Shah NL, Dunn RL, Greenfield TK, et al. Development and validation of a novel instrument to measure patient satisfaction in multiple dimensions of urological cancer care quality. *J Urol*. 2003;169:11–19. https://doi.org/10.1016/S0022-5347(03)80016-2.
26. Hamilton DF, Lane JV, Gaston P, et al. Assessing treatment outcomes using a single question: the net promoter score. *Bone Joint J*. 2014;96-B:622–628. https://doi.org/10.1302/0301-620X.96B5.32434.
27. Chew LD, Griffin JM, Partin MR, et al. Validation of screening questions for limited health literacy in a large VA outpatient population. *J Gen Intern Med*. 2008;23:561–566. https://doi.org/10.1007/s11606-008-0520-5.
28. Whelan T, Levine M, Willan A, et al. Effect of a decision aid on knowledge and treatment decision making for breast cancer surgery: a randomized trial. *JAMA*. 2004;292:435–441. https://doi.org/10.1001/jama.292.4.435.
29. Stelfox HT, Gandhi TK, Orav EJ, Gustafson ML. The relation of patient satisfaction with complaints against physicians and malpractice lawsuits. *Am J Med*. 2005;118:1126–1133. https://doi.org/10.1016/j.amjmed.2005.01.060.
30. Gravel K, Légaré F, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: a systematic review of health professionals' perceptions. *Implement Sci*. 2006;1. https://doi.org/10.1186/1748-5908-1-16.