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# Using Shared Decision-Making Tools and Patient-Clinician Conversations About Costs

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## Abstract

**Objective:** To determine how shared decision-making (SDM) tools used during clinical encounters that raise cost as an issue impact the incidence of cost conversations between patients and clinicians.

**Patients and Methods:** A randomly selected set of 220 video recordings of clinical encounters were analyzed. Videos were obtained from eight practice-based randomized clinical trials and one quasi-randomized clinical trial (pre- and post-) comparing care with and without SDM tools. The secondary analysis took place in 2018 from trials ran between 2007 and 2015.

**Results:** Most patient participants were white (85%), educated (38% completed college), middle-aged (mean age 56 years), and female (61%). There were 105 encounters with and 115 without the SDM tool. Encounters with SDM tools were more likely to include both general cost conversations (62% vs 36%, odds ratio [OR]: 9.6; 95% CI: 4 to 26) as well as conversations on medication costs specifically (89% vs 51%, $P=.01$). However, clinicians using SDM tools were less likely to address cost issues during the encounter (37% vs 51%, $P=.04$). Encounters with patients with less than a college degree were also associated with a higher incidence of cost conversations.

**Conclusion:** Using SDM tools that raise cost as an issue increased the occurrence of cost conversations but was less likely to address cost issues or offer potential solutions to patients' cost concerns. This result suggests that SDM tools used during the consultation can trigger cost conversations but are insufficient to support them.

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Only one-third of clinicians report ever discussing the costs of care with patients,[1-4] and when these discussions do occur they are often reactive, occurring only after the patient has experienced financial hardship because of treatment.[1,2] Professional bodies and patient advocates maintain that clinicians have an ethical duty to at least discuss out-of-pocket costs in the same way that they would discuss the adverse effects of a treatment.[5-7] Despite these recommendations, patients and clinicians report that cost conversations are rare (although admittedly there is variation in their incidence, depending on how cost conversations are defined and whether they are self-reported or observed).[8] Moreover, both patients and physicians perceive barriers to discussing costs in clinical encounters.[2] Some barriers described are clinicians' lack of comfort or confidence in discussing costs and beliefs that cost discussions should not occur, as well as challenges accessing, interpreting, and communicating cost.[2,9,10]

Shared decision-making (SDM) tools are designed to help patients and clinicians participate in making specific choices among health care options.[11] These tools describe options, benefits, harms, and areas of uncertainty for different health care treatments. Shared decision-making tools have been shown to increase knowledge, accurate risk perceptions, satisfaction with the decision, and the number of patients achieving decisions that were informed by and consistent with their values.[12] Shared decision-making tools delivered within the encounter have been consistently shown to facilitate SDM[13-16] and may help overcome barriers to discussing costs.

Many SDM tools raise cost as an issue in some way, but only 13% mention a specific price or price range.[17] Moreover, the extent to which the inclusion of cost information in SDM tools improves costs conversations when making treatment decisions remains unclear. To investigate this impact, we performed a secondary analysis of video-recorded clinical encounters from eight practice-based randomized trials and one quasi-randomized clinical trial (pre- and post-) that used SDM tools developed by our team. We compared the incidence and characteristics of cost conversations in encounters using those SDM tools that include information about cost to usual care.

## PATIENTS AND METHODS

### Population

We included a stratified random sample of 220 video recordings of clinical encounters that were obtained during the conduct of eight practice-based randomized clinical trials and one quasi-randomized clinical trial (pre- and post-).[13,15,18-21] These nine trials aimed to assess the impact of six different SDM tools on the decision-making process of the following medical situations (one tool per situation) chest pain, diabetes, Graves' disease, depression, osteoporosis, and cardiovascular risk prevention (Supplementary Table 1, available online at http://www.mcpiqo journal.org). With 220 video-recorded visits, half of these including SDM tools, we had >85% power to estimate meaningful differences (>.05 SD; >10%) in the frequency of cost conversations in both groups (SDM tool vs control) and across the subgroups.

The secondary analysis took place in 2018 from trials that took place between 2007 and 2015.

### Study Outcomes

We examined the impact of SDM tool use on the incidence of cost conversations. Given that discussions of cost between a clinician and a patient may raise more than one cost issue, we also assessed the impact of the SDM tools on several aspects of the encounters: the number and type of cost issues raised, who initiated the discussion of cost issues (clinician vs patient), the number of cost issues addressed by clinicians (where some kind of action was taken), and the number and kinds of cost reduction strategies offered. To estimate the overall time spent on cost conversations we measured the time (in seconds) spent on each individual cost issue in encounters. Finally, we examined the impact of patient-level factors on the occurrence of cost conversations, including patient education level (less than college education vs college education or more), annual income (<$40,000 vs ≥$40,000), race (minority vs non-minority), and the trial in which they participated.

### Coding Scheme

We developed a coding scheme a priori based on available literature about cost conversations and a previous coding scheme used to analyze audio recordings of cost conversations with patients with cancer.[22] Whenever a cost issue was discussed, we assessed who initiated the conversation (clinician or patient), the length of the conversation (in seconds), the number of cost issues discussed per encounter, the types of cost-related issues discussed, and whether the cost issue was addressed (some action was taken), acknowledged (remarked upon but no action was taken), or ignored by the clinician(s). Further, when a cost issue was addressed, we noted what actions clinicians took and what potential solutions they offered. The full codebook with explanatory definitions and examples is available as Supplementary Table 2 (available online at http://www.mcpiqojournal.org). During coding researchers only coded verbal communication because some patients in our sample preferred only to have the audio recorded during their encounter. Finally, for each patient we obtained basic demographics and noted the trial in which they were enrolled.

### Coding Scheme Calibration

Three team members were trained to use the coding scheme and then asked to independently code an initial set of 10 videos. To calibrate, the three coders met to cross-check coding results for concordance, resolve disagreements in data interpretation, and refine coding scheme definitions and usage. After two rounds of training and calibration on the first 10 videos, coders were asked to independently code three additional videos to ensure

### TABLE 1. Demographics[a]

| | Total | SDM tool | No SDM tool |
|---|---|---|---|
| **Study** | | | |
| Chest pain | 54 (24.5) | 26 (22.6) | 28 (24.3) |
| Diabetes | 45 (20.5) | 22 (21.0) | 23 (20.0) |
| Osteoporosis | 31 (14.1) | 17 (16.2) | 14 (12.2) |
| Statin choice | 19 (8.6) | 5 (4.8) | 14 (12.2) |
| Graves' disease | 32 (14.5) | 17 (16.2) | 15 (13.0) |
| Depression | 39 (17.7) | 18 (17.1) | 21 (18.3) |
| **Male** | 85 (38.6) | 44 (41.9) | 41 (35.7) |
| **Age, y** | 55.8±14.4 | 55.8±13.9 | 55.8±14.9 |
| **Race** | | | |
| White/Caucasian | 190 (86.4) | 91 (86.7) | 99 (86.1) |
| Asian | 3 (1.4) | 1 (1.0) | 2 (1.7) |
| Black/African American | 11 (5.0) | 2 (1.9) | 9 (7.8) |
| Other | 7 (3.2) | 4 (3.8) | 2 (1.7) |
| Unknown | 9 (4.1) | 7 (6.7) | 2 (1.7) |
| **Education** | | | |
| 8th grade or less | 2 (0.9) | 1 (1.0) | 1 (1.0) |
| Some high school | 13 (5.9) | 5 (4.8) | 8 (7.0) |
| High school grad/GED | 51 (23.2) | 27 (25.7) | 24 (20.9) |
| Some college | 83 (37.7) | 39 (37.1) | 44 (38.3) |
| College grad | 35 (15.9) | 21 (20.0) | 14 (12.2) |
| Graduate degree | 32 (14.5) | 10 (9.5) | 22 (19.1) |
| Missing | 4 (1.8) | 2 (1.9) | 2 (1.7) |
| **Income, USD** | | | |
| <20K | 28 (12.7) | 10 (9.5) | 18 (15.7) |
| 20K — 40K | 27 (12.3) | 12 (11.4) | 15 (13.0) |
| 40K — 60K | 34 (15.5) | 19 (18.1) | 15 (13.0) |
| 60K — 80K | 23 (10.5) | 14 (13.3) | 9 (7.8) |
| 80K — 100K | 13 (5.9) | 4 (3.8) | 9 (7.8) |
| 100K+ | 35 (15.9) | 16 (15.2) | 19 (16.5) |
| Unknown | 60 (27.3) | 30 (28.6) | 30 (26.1) |

[a]GED = general education development; USD = US dollars.

Values shown are n (%) or mean ± SD.

that all coders were able to identify cost conversations; after one round of reviewing codes for the final three videos, the coders began coding the full dataset independently. Soon after beginning to code the full dataset, one coder left the project and two coders completed the rest of the analysis. During the analysis a duplicate set of 10 videos (unknown by the coders) was used to monitor agreement and estimate an overall kappa statistic (kappa = 1). Additionally a duplicate set of five videos (known to the coders) was used to allow the two coders to continue to meet biweekly and calibrate agreement if needed. All videos used for calibration were included in the final data analysis.

### Analysis

We computed descriptive statistics for all patient baseline characteristics. Categorical variables are reported as frequencies and percentages, whereas continuous variables are reported using mean and SD. We tested for differences between SDM tool and usual care groups using $\chi^2$ tests for categorical variables and Student $t$ tests for continuous variables. We used a multivariable logistic regression model to analyze the odds of a cost conversation after adjusting for age, sex, race, level of education, and study the participant was a part of as covariates. Regression results are reported using odds ratios (ORs) and their 95% CIs. Income groups were not included

**TABLE 2. Logistic Regression Model Where the Binary Outcome Is Whether a Cost Conversation Occurred[a]**

| | Unadjusted OR (95% CI) | Adjusted OR (95% CI) | P value[b] |
|---|---|---|---|
| SDM tool used | 2.93 (1.70-5.11) | 9.55 (3.96-26.15) | <.001 |
| In a minority group | 0.87 (0.35-2,11) | 0.49 (0.14-1.65) | .248 |
| Age | 1.00 (0.98-1.02) | 0.98 (0.95-1.01) | .283 |
| Sex (ref = female) | 0.93 (0.54-1.60) | 0.57 (0.23-1.40) | .223 |
| Less than college education level | 2.42 (1.34-4.44) | 3.37 (1.40-8.72) | .009 |
| Trial group (ref = statin choice) | | | |
|   Chest Pain | 0.03 (0.005-0.16) | 0.01 (0.001-0.05) | <.001 |
|   Diabetes | 2.78 (0.90-8.77) | 2.66 (0.65-11.34) | .175 |
|   Graves' disease | 1.02 (0.32-3.20) | 0.29 (0.06-1.45) | .136 |
|   Depression | 3.00 (0.94-9.91) | 1.69 (0.33-9.04) | .532 |
|   Osteoporosis | 0.65 (0.20-2.05) | 0.21 (0.04-0.97) | .050 |

[a]OR = odds ratio; ref = reference; SDM = shared decision-making.
[b]Values are for adjusted model.

as covariates in the logistic regression model due to the large amount of missing data. Secondary analysis for each individual cost conversation was performed in R Statistical Software version 3.4.1 (Foundation for Statistical Computing) and Stata version 14.1 (StataCorp). P<.05 was considered statistically significant.

## RESULTS

There were 220 total encounters in the study: 105 with a SDM tool (SDM tool group) and 115 without a SDM tool (control group). The majority of encounters belonged to the chest pain and diabetes trials. Patients were mostly female (135; 61.4%) and white (190; 86.4%), with a mean age of 56±14.4 years and some college education (83; 37.7%). Patients in the SDM tool group had a higher percentage of men, but otherwise had characteristics similar to patients in the control group (Table 1).

Of the 220 videos, 106 contained a cost conversation (48.2%). Among the SDM tool group, 65 (61.9%) of encounters had a cost conversation compared with only 41 (35.7%) in the control group that had a cost conversation. Among those encounters that had a cost conversation, the SDM tool group had cost conversations that were, on average, longer than those in the control group (median 50 s vs 45 s, P=.32). The lengths of time for the cost conversations in both groups were right-skewed due to some

much longer cost conversations (longest cost conversation was 49.2 min). Initiation of the first cost conversation was also different by group. When a cost conversation occurred, 55 (84.6%) of the first cost conversations in the SDM group were initiated by the clinicians, whereas in the control group most cost conversations (58.5%) were initiated by patients (P<.001). Cost conversations were more frequent in the diabetes and cardiovascular prevention trials (34; 75.6%) and less frequent in the trial where patients decided whether to undergo stress testing for chest pain (2; 3.7, P<.001). Cost conversations were also more likely to occur in patients with annual incomes <$40,000 than in patients with incomes ≥$40,000 (56.4% vs 34.3%, P=.01).

In our logistic regression analysis (Table 2), the odds of a cost conversation occurring were 9.6 times greater if an SDM tool was used compared to if one was not used, adjusting for age, sex, level of education, study the participant was a part of, and racial minority status. In addition, patient participants who had less than a college education level were 3.4 times more likely to have a cost conversation than those who had at least some college education or more. There were no statistically significant differences between trial groups for odds of having a cost conversation, except for participants in the chest pain group, who were less likely to have a cost conversation than those in the reference

**TABLE 3. Cost Conversation by Topics (N = 105)[a]**

| Cost topics | Topic definitions | n (%) |
|---|---|---|
| Administrative burden | Getting into the system, calling insurance companies, other administrative tasks. | 2 (1.9) |
| Drug costs | Cost of medications. | 79 (75.2) |
| Family impacts | Impacts on or of patient families (eg, ability to pay college tuition). | 5 (4.8) |
| Patient productivity/lost wages | Employment status and work productivity. | 12 (11.4) |
| Basic needs | Costs of everyday needs such as transportation, parking, food, shelter. | 20 (19.0) |
| Future care | Costs of follow-up care, future testing/visits. | 8 (7.6) |
| Insurance-related costs | Insurance premiums, copays, coverage. | 69 (65.7) |
| Travel | Indirect costs of care (travel, hotels, meals). | 3 (2.9) |
| Child/elder care | Impacts on or of care for children/elders. | 2 (1.9) |
| Health care | Costs of care excluding medications (consults, labs, scans, surgeries, procedures, nutritionists, etc). | 23 (21.9) |
| Required lifestyle/behavioral changes | Lifestyle costs such as going to the gym, getting a massage, taking a vacation. | 3 (2.9) |

[a]More than one cost topic was observed in most conversations; in one encounter, no cost topics were observed.

(cardiovascular prevention trial) group (OR, 0.01; 95% CI, 0.001 to 0.05). Income level was not included in the logistic model due to a large amount of missing data.

More than one issue came up during many cost conversations and many patient participants had more than one conversation about cost during their visit (Table 3). The majority of the issues discussed during these conversations were related to drug costs (79; 75.2%), insurance-related costs (69; 65.7%), and health care costs (23; 21.9%). The distributions of these cost issues were similar among the SDM and control groups, with the exception that drug cost issues were more frequent in the SDM tool group than in the control group (89% vs 51%, $P=.001$). In addition, cost issues were less frequently addressed by clinicians in the SDM tool group than they were in the control group (36.5% vs 51.2%, $P=.04$).

For the 106 encounters that included at least one cost conversation, there were 232 unique cost conversations that took place. Within the 232 unique cost conversations, 53 offered at least one cost reducing strategy. The most prevalent cost reduction strategies were accommodating a less expensive follow-up plan (29; 54.7%) and facilitating the use of copay assistance/coupons (25; 47.2%).

Other strategies mentioned included changing medication dose frequency, offering free drug samples, referring patients to a specific pharmacy, nonprofit, or social worker, and changing pharmacies or change the timing of prescription refills among other cost reduction plans.

## DISCUSSION

Although cost conversations are typically infrequent in clinical encounters,[23] our results show that the use of SDM tools that raise cost as an issue had a significant impact on the incidence of cost conversations in our video sample. In fact, encounters supported by SDM tools had 9.6 times higher odds of having cost conversations than encounters not supported by SDM tools after adjusting for other covariates. These findings are significant because there are limited interventions for increasing the incidence of cost conversations between patients and clinicians.[24-26]

In addition to the use of SDM tools, we found other factors associated with the incidence of cost conversations, particularly the trial in which the patient was enrolled (eg, Grave's disease, diabetes), their educational level, and their income. For example, clinical encounters in the chest pain trial had the lowest frequency of cost conversations (4%).

In this trial, patients in the emergency room with chest pain and their clinicians discussed whether the patient would proceed with admission for an in-hospital stress test, leave and complete an outpatient stress test with cardiology, or leave and follow-up with primary care.[18] This was the only trial examining a decision for a diagnostic process as opposed to medical treatment; moreover, this trial was conducted in the emergency setting, under time pressures that discourage interpersonal rapport and might therefore exclude discussions of patient concerns such as cost.[27] Thus, the lack of cost conversations (both with and without an SDM tool) in the chest pain trial imply that cost issues might be less relevant or more difficult to elicit when there is diagnostic uncertainty or in encounters outside of an outpatient setting.

We also found that patients with less than a college education, as well as those with lower income levels (among those who did report their income—many did not) had more cost conversations with their clinicians than did patients with at least some college education and/or higher income levels. This aligns with our expectations that patients who are facing increased financial burdens may be more likely to engage in cost conversations with their clinicians. A 2018 survey reported that cost conversations happened more often among practices with Medicaid/uninsured-predominant payer mixes or in rural settings.[28] And other research suggests that difficulty with paying medical bills might be predicted by not just income but also education levels. For example, in a large cross-sectional survey, it was estimated that one-third of patients with less than a college education or with less than $50,000 in yearly household income reported problems paying medical bills in the past 12 months, in contrast to only 15% of patients with a college education or with an income of $100,000 or more.[29]

Discussing costs when making decisions around medical treatment has many potential benefits. For instance, cost conversations at the point of medical decisions could help patients with limited education or means to tailor treatments to their contexts and financial capacities, thereby potentially impacting treatment adherence. Although not every SDM encounter in our study included discussions of cost, we did observe that SDM tool use increased the incidence of cost conversations, likely due to the inclusion of cost information in the tools.

In fact, although SDM tools triggered more cost conversations than did usual care, cost issues in those tool-supported conversations were less frequently addressed by clinicians (through some kind of action) as compared with the control group. Additionally, it is worth considering in future research whether the presence of cost conversations is always an indicator of decision-making quality. A cost conversation could lower the quality of the decision-making process if it is not welcomed by both parties, or if the cost conversation is not perceived as benefitting the patient—for example, if a patient perceives a clinician is raising cost concerns as a cost-saving mechanism for the institution, rather than representing their interests and needs. However, the presence of cost conversations could improve patient-clinician interactions when patients are given the opportunity to explore how cost, along with other variables, influences which treatment or diagnostic option makes the most intellectual, emotional, and practical sense to them.

### Study Limitations

Our study has several limitations. First, we analyzed only one visit per patient as this was the study design for the trials included in this secondary analysis. Whether patients had shared previous conversations with the clinicians (on costs or in general) was unknown. However, the conversations captured for these trials and analyzed here were ones in which a decision needed to be made, making cost issue conversations relevant for the video-recorded encounter we observed, even if cost conversations had occurred in previous encounters. Second, our analysis focused on patients with conditions for which we had available data, which limits the generalizability of our findings to other types of patients and clinical contexts. Third, this was a secondary analysis of patients and clinicians who agreed to be video-recorded which could have resulted in selection bias. For instance, patients planning to bring up sensitive issues

related to cost could have been more likely to declined being recorded, thus affecting our estimates of cost conversation frequency. On average, 20% of patients declined to be video or audio recorded in the nine original clinical trials.

As health care costs continue to escalate, the need for conversations between clinicians and patients that explicitly address the costs of treatment increase alongside them.[30,31] Although our results show a clear correlation between SDM tool use and the incidence of cost conversations in clinical encounters; some of the SDM tools were used to support conversations about a particular issue (eg, efficacy of treatment), or conversations about risk, and not used to support conversations about other practical issues such as cost. Thus, this study should not lead to the conclusion that clinicians must use SDM tools with patients in order to have cost conversations or offer potential solutions to patients' cost concerns. We believe these aids are primarily useful as tools that identify issues important to patients, cost being only one such issue.

These results underscore the need to develop interventions that not only trigger cost conversations but also support them, providing patients with more accurate cost estimates and with tailored cost-saving strategies that fit each patient's individual needs.

## CONCLUSION
SDM tools that raise cost as an issue had a significant impact on the incidence of cost conversations; they were less likely to address cost issues or offer potential solutions to patient's cost concerns. This result suggests that SDM tools used during the consultation can trigger cost conversations but are insufficient to support them.

## SUPPLEMENTAL ONLINE MATERIAL
Supplemental material can be found online at http://www.mcpiqojournal.org. Supplemental material attached to journal articles has not been edited, and the authors take responsibility for the accuracy of all data.

Abbreviation: **SDM** = shared decision-making

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