



## Patient-Clinician Communication

### Associations With Important Health Outcomes Among Veterans With COPD

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**Background:** High quality patient-clinician communication is widely advocated, but little is known about which health outcomes are associated with communication for patients with COPD.

**Methods:** Using a cross-sectional study of 342 veterans enrolled in a randomized controlled trial, we evaluated the association of communication, measured with the quality of communication (QOC) instrument, with subject-reported quality of clinician care, breathing problem confidence, and general self-rated health. We measured these associations using general estimating equations and adjusted odds ratios (OR) of patient-reported outcomes associated with one-point changes in QOC scores.

**Results:** Nearly one-half of the subjects reported receiving the best imaginable care (47%), whereas fewer reported being confident with their breathing problems all the time (29%) or in very good or excellent health (15%). General communication was associated with best-imagined quality of care (OR, 4.29; 95% CI, 2.84-6.48;  $P < .001$ ) and confidence in dealing with breathing problems all the time (OR, 1.74; 95% CI, 1.34-2.25;  $P < .001$ ) but not general self-rated health (OR, 1.19; 95% CI, 0.92-1.55;  $P = .19$ ). Specific clinician behaviors with larger associations with higher quality care included listening, caring, and attentiveness. The associations between general communication and quality care increased over time ( $P$  for interaction .03).

**Conclusions:** Communication between patients and clinicians is associated with quality of care and confidence in dealing with breathing problems, and this association may change over time. Attention to specific communication strategies may lead to improvements in the care of patients with COPD.

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**Abbreviations:** GOLD = Global Initiative for Chronic Obstructive Lung Disease; OR = odds ratio; QOC = quality of communication

COPD afflicts millions, causes significant morbidity, and is the fourth-leading cause of mortality in the United States.<sup>1-4</sup> Good communication between patients with COPD and their clinicians is valued by

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both parties and is recommended by organizations such as the Institute of Medicine and the Global Initiative for Chronic Obstructive Lung Disease (GOLD).<sup>4,5</sup> Better communication is thought to improve knowledge and the therapeutic alliance between patient and clinician, potentially enhancing patients' self-management skills,<sup>6</sup> but previous studies indicate a broad range of deficiencies in how clinicians discuss treatments and quality of life among patients with

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COPD.<sup>7,8</sup> Efforts to improve communication may improve specific verbal and nonverbal exchanges but less often improve other health outcomes,<sup>9</sup> and evidence for improvements attributable to enhanced communication is sparse.

The goal of this study was to use a patient-centered care model of communication<sup>10</sup> to guide the evaluation of associations between modifiable and specific elements of communication and important patient-reported health outcomes among patients with COPD. We evaluated two intermediate outcomes and one distal outcome; the intermediate outcomes, patient-reported quality of care from the primary clinician of COPD care and confidence in dealing with breathing problems, were selected because of their importance to patients and their significant role in self-management programs<sup>11</sup>; the distal outcome of personal rating of health was selected because it measures overall health and is associated with mortality and health-care costs.<sup>12,13</sup>

## MATERIALS AND METHODS

### *Setting and Subjects*

We performed a cross-sectional study using baseline data from a randomized controlled trial designed to improve the quality of communication regarding end-of-life care planning. Three hundred seventy-six subjects were enrolled at the Veterans Affairs Puget Sound Health Care System from November 2004 to December 2007. The protocol was approved by the institutional review board at the University of Washington (Seattle, WA).

Each enrolled subject had spirometric evidence of COPD as defined by GOLD criteria.<sup>4</sup> Clinicians endorsed patients to be approached and each subject was required to identify the primary clinician of his/her COPD care. Clinicians consisted of primary care practitioners and specialist pulmonologists, and included resident, fellow, and attending physicians, advanced registered nurse practitioners, and a physician assistant. Patients were eligible for the current study if they completed the baseline questionnaire (N = 342). Subjects who did not complete the questionnaire themselves, and those for whom these data were missing, were excluded.

### *Health Outcomes*

We evaluated three patient-reported outcomes: patient-reported quality of care from the primary clinician of COPD care, confidence in dealing with breathing problems, and general self-rated health. Quality of care was scored from zero to 10, with zero the "worst imagined" and 10 the "best imagined." Confidence in dealing with breathing problems is a component of the Seattle Obstructive Lung Disease Questionnaire and was scored from 0 ("never") to 6 ("all of the time").<sup>14</sup> General self-rated health is a validated measure of overall health and was scored from 1 ("poor") to 5 ("excellent").<sup>15</sup>

### *Communication Measurement*

We assessed the quality of communication using the general communication domain of the validated quality of communication questionnaire (QOC).<sup>16</sup> This instrument was developed to study

general and end-of-life communication for patients with life-limiting illness. Each item is scored from 0 to 10 on a Likert scale, with 0 the "worst imagined" and 10 the "best imagined." If subjects reported that the clinician did not perform the queried communication attribute, we assigned a score of 0.<sup>16</sup> The primary exposure variable was the quality of general communication, which is computed as the mean score for the six general communication attributes: using words you understand; looking you in the eye; answering all your questions; listening to what you have to say; caring about you as a person; and giving you his/her full attention. As secondary exposures, we analyzed these six individual general communication attributes.

### *Covariates*

Baseline sociodemographic characteristics and a health inventory checklist were obtained by self-report at the time of study enrollment and included age at entry, sex, race/ethnicity, marital status, income in \$10,000 increments, highest education level achieved, and smoking status (current, former, never). Subjects completed the St. George Respiratory Questionnaire to measure health-related quality of life<sup>17</sup> and the Mental Health Inventory-5 to measure current symptoms of depression.<sup>18</sup> Finally, subjects reported the length of time they had had a relationship with their COPD clinician.

All subjects had spirometry performed. Prebronchodilator and postbronchodilator values were recorded, and percent predicted values were calculated.<sup>19</sup> Information on outpatient medication use was extracted from the computerized medical record system, the Veterans' Health Information System Technology Architecture.

### *Analysis*

For the primary analysis, the associations between the quality of communication and the three outcomes were assessed using general estimating equations clustered on the individual clinician with a logit link and an exchangeable correlation matrix. In the analysis stratified by the length of the patient-clinician relationship, logistic regression was performed instead of general estimating equations, given the small number of observations in each stratum. Odds ratios (ORs) were reported for every one-point improvement in the communication score. Because there is no standardized method for evaluating these outcomes and we expected the results to be skewed toward higher scores, we decided a priori to dichotomize the outcome measures into the highest possible score vs lower scores. For general self-rated health, we subsequently decided to include "very good" along with "excellent" because few subjects reported excellent health (n = 4). We used a Student *t* test assuming unequal variances to characterize the difference in outcome scores based on length of the patient-clinician relationship, with the reference category < 2 years.

Because there are limited data about potential confounders of the associations between communication and health outcomes for patients with COPD, models were constructed parsimoniously, excluding variables that were not confounders if they did not change the threshold level of significance and/or point estimates > 10%. A priori, we adjusted for age, sex, and race/ethnicity. Education, smoking status, depression symptoms (measured by the Mental Health Inventory-5 instrument), previous self-reported physician diagnosis of depression, GOLD stage of COPD, and St. George Respiratory Questionnaire general score did not confound the relation between general communication and outcomes, so they were not included in the final model. We hypothesized that communication may change over time with the length of the patient-clinician relationship,<sup>20</sup> so we assessed

the association between general communication quality and the patient-reported outcomes for effect modification by this variable. All tests were two tailed and used robust standard errors to minimize assumptions about equal variance in the subjects,<sup>21</sup> and  $P < .05$  was considered statistically significant. To correct for multiple comparisons of the individual communication attributes, we used the conservative Bonferroni correction so that  $P < .008$  was considered statistically significant. Analyses were conducted using STATA SE-10 MP (StataCorp; College Station, TX).

## RESULTS

The majority of the 342 subjects had seen their COPD clinician for  $> 2$  years (Table 1). Patients reflected an older, socioeconomically disadvantaged population with significant psychiatric illnesses (Table 1). On average, subjects had severe COPD as judged by postbronchodilator percent-predicted FEV<sub>1</sub>.

One hundred forty-nine subjects (46.6%) reported that their clinicians gave the best-imagined quality of care. Comparing subjects who had the same clinician for  $< 2$  years with those having the same clinician for  $> 5$  years, a higher proportion of those

subjects who reported having the same clinician longer noted receiving the best-imagined care (55.4% vs 37.0%;  $P = .02$ ) (Table 2). Overall, 28.7% of subjects reported confidence in dealing with breathing problems all the time and 14.7% of subjects reported very good or excellent general self-rated health.

Overall communication scores were excellent (mean 9.2 [SD 1.2]). There was little variability in QOC mean scores based on the duration of the patient-clinician relationship ( $> 2$  years, 9.1 [SD 1.5]; 2-5 years, 9.1 [SD 1.1]; and  $\geq 5$  years, 9.2 [SD 1.2]). For the overall cohort, each of the six general communication attributes was scored high as well. Only two attributes had mean scores  $< 9$ : using words you understand (mean 8.4 [SD 2.3]) and answering all your questions (mean 8.8 [SD 2.0]).

Unadjusted and adjusted ORs for a 1-point change in the QOC score are reported in Table 3. After adjustment, the quality of general communication was associated with best-imagined quality of care (OR, 4.29; 95% CI, 2.84-6.48;  $P < .001$ ). General communication quality was associated with confidence

**Table 1—Characteristics of Cohort Stratified by the Length of the Patient-Clinician Relationship**

Characteristic	Clinician Relationship		
	$< 2$ y (n = 90)	2-5 y (n = 152)	$> 5$ y (n = 98)
Age, y	69.1 ± 10.4	68.6 ± 10.0	71.1 ± 9.8
Male	83 (92.2)	149 (98.0)	97 (99.0)
Race/ethnicity			
Black	3 (3.4)	9 (6.1)	10 (10.3)
White	81 (91.0)	125 (84.5)	81 (83.5)
Other	5 (5.6)	14 (9.5)	6 (6.2)
Socioeconomic status			
Married	42 (47.2)	73 (48.3)	47 (48.0)
Income: $< \$40,000/y$	68 (80.0)	108 (76.1)	66 (72.5)
Education: $\leq$ high school graduate	39 (43.3)	64 (42.1)	37 (37.8)
Smoking status			
Current	20 (22.5)	45 (30.0)	25 (25.5)
Former	66 (74.2)	98 (65.3)	71 (72.5)
Never	3 (3.4)	7 (4.7)	2 (2.0)
COPD severity			
FEV <sub>1</sub> (% predicted)	50.8 ± 23.7	50.4 ± 19.9	48.8 ± 19.2
FEV <sub>1</sub> (GOLD severity categories)			
Mild	12 (13.8)	10 (6.8)	6 (6.7)
Moderate	29 (33.3)	61 (41.2)	35 (38.9)
Severe	27 (31.0)	52 (35.1)	34 (37.8)
Very severe	19 (21.8)	25 (16.9)	15 (16.7)
Using ICS	45 (26.6)	71 (42.0)	53 (31.4)
Using LABA	47 (30.9)	69 (45.4)	36 (23.7)
St. George score	51.6 ± 17.8	48.5 ± 17.7	50.1 ± 17.8
Psychiatric comorbidity <sup>a</sup>			
Depression	31 (34.4)	59 (39.1)	36 (36.7)
PTSD	16 (17.8)	34 (22.5)	25 (25.5)

Data are presented as No. (%) or mean ± SD. Less than 5% missing information for all variables, except for income, where 7% were missing this information. Two subjects missing information on length of clinician relationship. Percentages are of nonmissing data but may not add up to 100% secondary to rounding. GOLD = Global Initiative for Chronic Obstructive Lung Disease; ICS = inhaled corticosteroid; LABA = long-acting  $\beta$ -agonist; PTSD = posttraumatic stress disorder.

<sup>a</sup>Self-reported physician/nurse diagnosis.

**Table 2—Health Outcomes: Number and Percentage of Subjects Reporting the Best Outcomes Stratified by Length of the Patient-Clinician Relationship**

Health Outcomes	Clinician Relationship		
	<2 y	2-5 y	>5 y
Quality of care from clinician: “Best I could imagine”	30 (37.0)	67 (45.9)	51 (55.4)
Confidence in dealing with breathing problems: “All of the time”	27 (30.0)	45 (30.6)	24 (24.7)
General self-rated health: “Very good” or “Excellent”	14 (15.6)	27 (17.9)	9 (9.3)

Data are presented as No. (%). Percentages are of nonmissing subjects reporting best scores in each clinician-relationship column.

in dealing with breathing problems all the time (OR, 1.74; 95% CI, 1.34-2.25;  $P < .001$ ). Three attributes of communication were associated with breathing problem confidence: looking you in the eye, listening to what you have to say, and giving you his/her full attention (significant after Bonferroni adjustment). Finally, general communication quality was not significantly associated with general self-rated health rated very good or excellent (OR, 1.19; 95% CI, 0.92-1.55;  $P = .19$ ). Of the general communication attributes, only clinician attentiveness was associated with general self-rated health, although this was not significant after Bonferroni adjustment ( $P = .01$ ).

When stratified by the length of the patient-clinician relationship, general communication quality was positively associated with best-imagined quality of care, and this association grew as the duration of the relationship increased (Table 4). The  $P$  value for interaction was 0.03, indicating a significant difference in this association over time. There was no evidence for effect modification by the length of the patient-clinician relationship for breathing problem confidence. The association between general communication quality and general self-rated health seemed to decrease as the patient-clinician relationship duration increased but was significant only for subjects with relationships of <2 years (OR, 4.33; 95% CI, 1.07-17.50;  $P = .04$ ). The  $P$  value for interaction was not significant ( $P = .08$ ).

## DISCUSSION

To our knowledge, our study is the first to describe associations between clinician communication and important patient-reported outcomes for patients with COPD. We found that high-quality patient-clinician communication was associated with reports of high-quality health-care delivery. Communication quality was also associated with confidence in dealing with breathing problems, but not with general self-rated health. Of specific attributes of communication,

**Table 3—Association Between Attributes of Communication and Patient-Reported Outcomes**

Communication Attributes	Unadjusted ORs (95% CI)	Adjusted ORs <sup>a</sup> (95% CI)
Quality of care from clinician: “Best I could imagine”		
General communication quality	3.95 (2.73-5.71)	4.29 (2.84-6.48)
Using words you understand	1.37 (1.07-1.74)	1.38 (1.08-1.75)
Looking you in the eye	2.41 (1.57-3.71)	2.41 (1.56-3.74)
Answering all your questions	2.09 (1.43-3.05)	2.08 (1.40-3.09)
Listening to what you have to say	2.43 (1.39-4.27)	2.47 (1.37-4.45)
Caring about you as a person	3.26 (2.12-5.01)	3.29 (2.12-5.10)
Giving you his/her full attention	3.05 (2.08-4.49)	3.35 (2.17-5.18)
Confidence in dealing with breathing problems: “All of the time”		
General communication quality	1.75 (1.33-2.30)	1.74 (1.34-2.25)
Using words you understand	1.11 (0.96-1.28)	1.11 (0.97-1.27)
Looking you in the eye	1.70 (1.22-2.37)	1.74 (1.25-2.43)
Answering all your questions	1.16 (0.95-1.42)	1.17 (0.94-1.44)
Listening to what you have to say	1.58 (1.16-2.14)	1.59 (1.18-2.13)
Caring about you as a person	1.28 (0.91-1.79)	1.28 (0.92-1.79)
Giving you his/her full attention	1.84 (1.34-2.51)	1.80 (1.33-2.43)
General self-rated health: “Very good” or “Excellent”		
General communication quality	1.24 (0.95-1.61)	1.19 (0.92-1.55)
Using words you understand	1.00 (0.87-1.16)	1.00 (0.86-1.16)
Looking you in the eye	1.01 (0.84-1.21)	0.99 (0.83-1.19)
Answering all your questions	1.22 (1.00-1.49)	1.20 (0.97-1.49)
Listening to what you have to say	1.07 (0.87-1.32)	1.05 (0.87-1.27)
Caring about you as a person	1.33 (1.01-1.74)	1.28 (0.97-1.70)
Giving you his/her full attention	1.57 (1.16-2.13)	1.45 (1.09-1.93)

Each OR is for a one-point increase in subject-reported communication quality. General estimating equations, clustered on the individual clinician, were used for this analysis. OR = odds ratio.

<sup>a</sup>Adjusted for age, sex, and race/ethnicity.

listening, caring, and attentiveness had the largest associations with these outcomes, and only attentiveness was possibly associated with general self-rated health.

Communication between patients and clinicians is a critical component of high-quality care<sup>22</sup> and models of patient-centered care underscore communication as a vital facilitator to improve morbidity and mortality.<sup>23,24</sup> High-quality, patient-clinician communication strategies are a feature of self-management programs for patients with COPD, which, in turn, lead to better patient care and decreased costs,<sup>6</sup> although the role communication itself plays is unclear. Although improved patient-clinician communication is widely advocated,<sup>4,5</sup> there is a dearth of information on which health outcomes are facilitated by high-quality communication.<sup>9</sup> As echoed in a systematic review of the association between communication and health outcomes,<sup>25</sup> our results show that for patients with COPD, good communication may affect intermediate outcomes such as quality of care and confidence in dealing with breathing problems, but may be less likely to change distal outcomes such as general health.

The specific elements of patient-clinician communication that affect health outcomes are not well defined.<sup>26</sup> Improving patient-reported outcomes through improving clinician communication is challenging.<sup>27</sup> Communication interventions increase the use of a patient-centered approach by clinicians but are less likely to change health outcomes for patients.<sup>28,29</sup> Given our results, focusing on a select few communication strategies, such as listening, caring, and attentiveness, may be useful for clinicians and may help guide the development of interventions.

The effect of the length of the patient-clinician relationship has not been well studied,<sup>30</sup> although we hypothesized that the association of communication with patient-reported outcomes might increase with time.<sup>20</sup> In our study, the association between general

communication and clinician quality care increased the longer the time of the patient-clinician relationship. In contrast, there was no evidence that the association between communication and breathing problem confidence changed over time. The magnitude of the association between general communication and general self-rated health seemed to diminish with increasing lengths of time of the patient-clinician relationship but the difference was not significant.

The causes of the changing association over time between communication and patient-reported clinician quality are likely multifactorial and not mutually exclusive. For instance, rapport between the individual patient and the clinician may improve over time<sup>20</sup> without differences in specific communication techniques. Clinicians with less experience may still be developing communication attributes, although it is not clear if communication actually improves without specific training.<sup>31-33</sup> Finally, patients may select and stay with clinicians who have better communication skills.<sup>34</sup> These alternate explanations do not mitigate the importance of the length of the clinician-patient relationship as a modifier of the communication and quality of care association but should lead to further research to understand the causal pathways.

Our study has several strengths. First, as recommended by others,<sup>35,36</sup> we measured patient-reported communication quality as it relates to health outcomes because this differs from observed clinician behaviors. Second, communication is difficult to measure and although no particular instrument is advocated, instruments should be based on theoretic models of communication that measure aspects of patient-centered care.<sup>26</sup> The communication instrument we chose incorporates the premise of patient-centered communication<sup>23</sup> and also measures specific communication attributes to better guide clinician behaviors and focus future interventions. Third, the outcomes we assessed are important indicators of

**Table 4—Association Between General Communication and Patient-Reported Outcomes, Stratified by Length of the Patient-Clinician Relationship**

General Communication	Clinician Relationship		
	<2 y	2-5 y	>5 y
Quality of care from clinician: "Best I could imagine"			
General communication quality	2.01 (1.02-3.93)	5.88 (2.58-13.42)	6.34 (2.58-15.57)
<i>P</i> for interaction		.03	
Confidence in dealing with breathing problems: "All of the time"			
General communication quality	2.58 (1.03-6.46)	2.53 (1.35-4.74)	1.35 (0.90-2.02)
<i>P</i> for interaction		.43	
General self-rated health: "Very good" or "Excellent"			
General communication quality	4.33 (1.07-17.50)	1.16 (0.76-1.76)	1.15 (0.77-1.72)
<i>P</i> for interaction		.08	

Data are presented as ORs (95% CI), adjusted for age, sex, and race/ethnicity. Each OR is for a one-point increase in subject-reported communication quality. See Table 3 for expansion of the abbreviation.

quality health-care delivery and general health. For instance, general self-rated health has been shown to be a good predictor of both mortality and health-care costs,<sup>12,13</sup> and successful self-management programs target confidence in dealing with breathing problems as a mediator to improve health.<sup>11</sup>

The study has several limitations. First, the cross-sectional design precluded an evaluation of the directionality of the association between communication and the measured outcomes. Second, although we evaluated many potential confounders, there are limited data to guide the selection of confounders, so residual and unmeasured confounding may have unpredictably biased our results. Third, the associations with intermediate and distal outcomes are similar to previous studies<sup>25</sup> but the associations we observed in this secondary analysis should not be construed as causal. Finally, the subjects were mainly older, male veterans whose results may not be generalizable to other populations.

## CONCLUSIONS

In summary, these results indicate that for patients with COPD, patient-clinician communication may be an important mediator to improve intermediate outcomes such as quality clinician care and confidence in dealing with breathing problems but it is less important for distal outcomes such as general health. Because the association between communication and quality care may increase over time, health-care systems and payers may want to facilitate long-term relationships between patients and clinicians. Communication is a modifiable skill<sup>37</sup> but perhaps only with considerable effort,<sup>28</sup> and active clinicians may not have the luxury of engaging in intensive interventions. Focusing on specific strategies may encourage the adoption of patient-centered communication techniques. In particular, increased attention to listening, caring, and attentiveness may lead to improved intermediate health outcomes for patients with COPD.

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*Ms Moss:* contributed to data analysis and interpretation and final approval of the manuscript.

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*Dr Au:* contributed to the study's conception and design, collection and assembly of data, data analysis and interpretation, and writing and final approval of the manuscript.

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