Title
Interactions between patients, providers, and health systems and technical quality of care.

Authors
Yelin, Edward
Yazdany, Jinoos
Tonner, Chris
et al.

Interactions between Patients, Providers, and Health Systems and Technical Quality of Care

Edward Yelin, Ph.D.[1,2], **Jinoos Yazdany, M.D., M.P.H.**[1], **Chris Tonner, M.P.H.**[1,2], **Laura Trupin, M.P.H.**[1,2], **Lindsey A. Criswell, M.D., M.P.H.**[1], **Patricia Katz, Ph.D.**[1,2], and **Gabriela Schmajuk, M.D., M.Sc.**[1]

[1]The Rosalind Russell/Ephraim P. Engleman Rheumatology Research Center

[2]Philip R. Lee Institute for Health Policy Studies, UCSF

Abstract

Objectives—Prior studies have established disparities by race/ethnicity and socioeconomic status (SES) in the kind, quantity, and technical quality of SLE care and outcomes. In this study we evaluate whether disparities exist in assessments of interactions with health care providers and health plans and whether such interactions affect the technical quality of SLE care.

Methods—Data derive from the Lupus Outcomes Study (LOS). Principal data collection is an annual structured phone interview including items from the Consumer Assessment of Health Plans and Interpersonal Processes of Care Scale measuring dimensions of health care interactions. We use general estimating equations to assess whether disparities exist by race/ethnicity and SES in being in the lowest quartile of ratings of such interactions and whether ratings in the lowest quartile of interactions are associated with technical quality of care after adjustment for sociodemographic and disease characteristics.

Results—In the 2012 LOS interview, there were 793 respondents, of whom 640 had ≥ 1 visits to their principal SLE provider. Non-white race/ethnicity and education were not associated with low ratings on any dimension of provider or system interaction; poverty was associated only with low ratings of health plan interactions. After adjustment for demographics, SLE status, and health care variables, ratings in the lowest quartile on all dimensions were associated with significantly lower technical quality of care.

Conclusions—Ratings in the lowest quartile on all dimensions of interactions with providers and the health care system were associated with lower technical quality of care, potentially resulting in poorer SLE outcomes.

Prior research has established that there are disparities by race/ethnicity and socioeconomic status in the quantity and kind of health care used, and in select outcomes among persons with systemic lupus erythematosus (SLE) [1–9]. Although disparities in outcomes appear to be due to an array of factors, including the socioeconomic status of persons with SLE, characteristics of their communities, and the nature of the health care they receive [10–13],

Correspondence: Edward Yelin, Ph.D., UCSF Box 0920, San Francisco, California 94143-0920, Phone 415-476-9Interactions between Patients, Providers, and Health Systems and Technical Quality of CareF027 Fax 415-476-9030, ed.yelin@ucsf.edu.

there is also evidence that differences in technical quality of care play a role in accrued damage [14]. To measure technical quality of care in SLE, 20 quality indicators have been developed that cover general preventive strategies, osteoporosis prevention and treatment, drug toxicity prevention and monitoring, renal disease prevention and treatment, and monitoring for cardiovascular risk factors [15].

In addition to technical quality, another proposed set of factors affecting access to care, health care utilization, and outcomes is the nature of interactions between patients and their providers and health plans along multiple dimensions [16,17]. These dimensions include both system (promptness or timeliness of care, care coordination, and assessment of health plans) and provider (patient-provider communication, trust in provider, and shared-decision making) characteristics. In the present paper, we report on a project that adapted recently-developed and validated measures of the nature of interactions between patients and providers and health plans for use among persons with SLE. We sought to evaluate whether there are differences in assessments of interactions with providers and health plans by race/ ethnicity and socioeconomic status and whether such interactions are related to the technical quality of care received, already identified as a key factor in outcomes.

Methods

Data Source

Data derive from the UCSF Lupus Outcomes Study (LOS). Briefly, the LOS was established in 2002 by re-enrolling persons with SLE who had previously participated in a study of genetic risk factors for SLE; two subsequent enrollments have occurred using the same sampling method. The participants in the study were recruited from a range of sources, including academic and community practices (33%), and lupus support groups and conferences (26%); and newsletters, web sites, and other forms of publicity (41%). Therefore, 66% of the LOS participants were derived from nonclinical sources [18]. At the point of enrollment in the LOS, each participant's medical records were reviewed to ensure that ACR criteria for SLE were met. LOS data are collected by an annual structured telephone interview conducted by experienced survey workers. The interview includes validated batteries covering sociodemographic characteristics, disease status, overall physical and mental health status, medications, health care utilization, and health insurance coverage. Several of the LOS investigators were involved in an effort to develop the SLE quality indicator (QI) set [15]. Of the 20 QIs that emerged from that project, 13 were amenable to self-report [14]. They cover general preventive strategies, osteoporosis care, drug monitoring, and renal disease care. Those 13 were included in the annual survey for the LOS starting in 2009 and serve as a measure of technical quality of care in the present study.

Over the course of the study, there have been 1,237 persons in the LOS and 8,346 person-years of observation (6.7 years per person). Year to year re-interview rates have averaged 93% including deaths or 95% excluding them.

Measures of Interactions between Patients and Providers and Health Plans

The Agency for Healthcare Research and Quality has developed and validated survey instruments to assess accessibility of providers and the nature of interactions between patients and providers and health plans as part of their Consumer Assessment of Healthcare Providers and Systems (CAHPS) Program [16]. The dimensions covered by CAHPS items include promptness or timeliness of care, care coordination, and an overall assessment of the health plan. Stewart and colleagues have developed the Interpersonal Processes of Care (IPC) scale to capture and expand upon aspects of care relevant to at-risk populations, including health care discrimination, trust in provider, and interpersonal style [17].

In 2012, we included batteries from the CAHPS items and IPC that were relevant to persons with SLE in the annual LOS survey. Appendix 1 includes a complete listing of the items from the CAHPS and IPC scales included in the survey and how each item maps to a dimension of interaction between patients and health providers and health systems. Communication with provider is comprised of 15 items, coordination of care by 1, promptness or timeliness of care by 5, shared decision-making by 6, trust in provider by 6, and assessment of the health plan by 5. As can be seen in the Appendix, items are not consistently coded within the CAHPS battery and also between the CAHPS and IPC batteries. We therefore transformed each item to a 0 (worst) to 100 (best) rating following a method outlined by Morales and colleagues [19]. For ratings on a 0 to 1 scale, responses were multiplied by 100. For ratings on a 0 to 10 scale, scores were multiplied by 10. For ratings on a 1–3 scale, scores were transformed to 0, 50, and 100. For ratings on a 1–4 scale, scores were transformed to 0, 33, 67, and 100. For each dimension, scores were averaged across the items in the dimension. Because of the differences in the original coding of the items, we dichotomized the ratings of each dimension into the lowest versus the highest three quartiles.

Analysis

In 2012, annual interviews were completed with 793 individuals. The present analysis is limited to the 640 who had one or more visits to their principal provider for SLE, necessary to provide assessments of providers and health systems. When comparing the 640 to those with no visits to the principal SLE provider, there were no differences by race/ethnicity and education level, but those without visits were less likely to be poor and more likely to have low levels of disease activity and accumulated damage. By tautology, such persons had a lower number of physician visits and a lower proportion with visits to rheumatologists and generalists, the specialties most likely to serve as principal SLE providers.

We use general estimating equations to estimate the relationship between sociodemographic characteristics, health system characteristics, and several measures of SLE- and overall-health status on the probability of being in the lowest quartile on each dimension of the interaction between patients and providers and health systems. We then used general estimating equations (GEE) to estimate the relationship between ratings in the lowest quartile on each individual dimension of interactions between patients and providers and health plans and the overall pass rate for technical quality indicators, with and without adjustment for the sociodemographic characteristics, health system characteristics, and the

SLE- and overall-mental health status measures. An overall pass rate is the number of indicators received as a proportion of the number for which an individual is eligible.

In addition to the analysis of the impact of individual dimensions of interactions between patients and providers and health plans, we created three summary measures of such interactions. The first was a count of all dimensions with ratings in the lowest quartile. The other two were counts of the ratings of provider and health system dimensions in the lowest quartile. In GEE, we are able to take into account the multiple observations among individuals in reporting care consistent with each of the individual technical quality indicators.

In the GEE estimations, the measures of sociodemographics include age (18–44, 45–64, and 65 or greater), race/ethnicity (non-Hispanic white vs. other), education (less than or equal to high school, some college, and college graduation or more), poverty status (less than or equal to 125% of the Federal poverty level for the respondent's household size vs. higher incomes), and language spoken at home (English vs. other). In an alternative estimation, we substituted a five-category race/ethnicity variable (non-Hispanic white, Hispanic, African American, Asian, and other) for the two category measure. As the results did not differ substantially from the primary analyses, they are not presented. The measures of health system characteristics include presence and source of insurance (none, public, employer, other), HMO status (HMO vs. other), and specialty of main SLE provider (no SLE provider or don't know, and combinations of general MD/internist and rheumatologist). The measures of SLE status include disease duration, disease activity (SLAQ), cumulative damage (BILD), and depressive symptoms (CES-D) [20].

Results

Table 1 shows the characteristics of the 640 LOS respondents who had one or more visits to their main SLE provider in the year prior to interview and who are therefore eligible to complete the survey items about interactions between patients and providers and health plans as well as the technical quality indicator set for SLE. Respondents averaged 53 years of age, just under 40% were non-white, just under one in five had a high school education or less, and 14% had incomes less than or equal to 125% of the Federal poverty level for a given household size. They had had their SLE for an average of two decades, about a third reported high levels of cumulative damage and many had high levels of disease activity. One in five had CESD scores consistent with high levels of depressive symptoms. Most reported some form of health insurance. Just under half received health insurance through public programs; about 42% were in HMOs. Eighty-five percent of respondents reported having seen a rheumatologist in the year prior to interview; of these, all but 14% also saw generalist providers. The table also shows the ratings for the six dimensions of interactions between patients and providers and health systems on the 0–100 scale. The highest ratings were for patient-provider communication (90, 95% CI 89–91) and trust in provider (89, 95% CI 88–90), while the lowest rating was for shared decision-making (43, 95% CI 41–46).

In Table 2, we show the odds of being in the lowest quartile of ratings on each dimension of provider and health system measures after adjustment for sociodemographics, SLE- and

health system factors. In the cells of the table, odds ratios greater than 1 indicate that the variable is associated with being in the lowest quartile on a dimension. Non-white race was not significantly associated with the odds of a rating in the lowest quartile on any dimension of provider and health system interactions. Similarly, less than a high school education was not associated with the odds of such a rating in any dimension; in fact, having less than a high school education was associated with a lower odds of being in the lowest quartile of ratings of trust and assessment of health plan, while having completed some college was associated with a lower odds of being in the lowest quartile of ratings of assessment of health plan. Having household income at or below 125% of the Federal poverty level was associated with a rating in the lowest quartile only in one dimension, the assessment of overall interactions with health plans.

Higher levels of disease activity as measured by SLAQ scores were associated with significantly increased probability of ratings in the lowest quartile for four dimensions, patient-provider communication, trust in the provider, care coordination, and assessment of interactions with health plans. Higher levels of accumulated damage as measured by the BILD score were associated with an increased probability of ratings in the lowest quartile on promptness or timeliness of care, while longer duration of disease was associated with a decreased probability of a low rating on this dimension. Health care characteristics were not associated with ratings in the lowest quartile of any dimension.

Table 3 shows the relationship between ratings on each dimension of interactions between patients and providers in the first versus the second through fourth quartiles and the pass rate for technical quality indicators, with and without adjustment for sociodemographic, SLE, and health care characteristics. In unadjusted analyses, only ratings in the second through fourth quartiles for promptness or timeliness of care were significantly associated with the pass rate for quality indicators. No single dimension of interactions between patients and providers was significantly associated with the pass rate after adjustment. However, for all dimensions, there was a trend for high ratings to be associated with slightly elevated pass rates, universally between two and four percentage points in the pass rate.

Table 3 also shows the relationship between cumulative measures of ratings in the lowest quartile on multiple dimensions and the pass rate. Pass rates were significantly higher among persons not providing ratings on any dimension in the lowest quartile than among those rating 1–3 or 4–6 dimensions, respectively, in the lowest quartile (pass rates of .71 versus .70 and .63). When the cumulative measures were subdivided into provider and health system measures, those with ratings of two or three items had lower pass rates for the quality indicators, albeit not at a level that reached statistical significance.

In the estimations for Table 3, we also evaluated whether race/ethnicity and poverty were related to each of the individual and combined measures (results not shown in table). In no instance were race/ethnicity or poverty significantly related to the pass rate.

Discussion

Interacting effectively with providers and health systems may be crucial to improving outcomes in a disease such as SLE. Flares of SLE require timely intervention and coordination among providers is necessary given the multiple manifestations of the condition. We and others have previously established that there are differences by race/ethnicity and socioeconomic status in health care [21–24] and outcomes [3,5–6,11,25–26]. However, the effect of race/ethnicity is reduced when taking socioeconomic status into account, suggesting that part of the effect of race/ethnicity may be due to socioeconomic status [2] and that it may be difficult to separate the effects of race/ethnicity, education and poverty. In the present paper, we assess whether race/ethnicity and socioeconomic status are associated with ratings of interactions between patients and providers and health systems. Such interactions along several dimensions may help to explain differences in health care utilization and technical quality of care that, in turn, may result in poorer outcomes.

Among the measures assessing interactions with providers, average ratings of patient-provider communication and trust in the provider were 90 and 89, respectively, indicating consistently good health care experiences in these domains. In contrast, a relatively low average ranking of 43 for shared decision-making indicates that there is substantial room for improvement in that dimension of care.

Communicating effectively about what a provider intends to do and establishing trust certainly represent important advances over the stereotype of the provider not caring to establish rapport, especially with patients from vulnerable backgrounds. However, the low ratings for shared decision-making suggest that the goal of establishing true patient-centered care has not been reached.

Among the measures assessing health systems, average ratings ranged from 74 (promptness/timeliness of care) to 79 (care coordination) and 80 (assessment of health plan). These ratings were higher than for shared decision-making, but substantially lower than for the other provider measures. Health system interactions may be especially critical in SLE because of the necessity to organize care among a range of medical specialties and to gain access to the providers and institutions with experience in dealing with the diverse and often serious manifestations of the disease, such as renal disease or neuropsychiatric involvement.

Non-white race was not significantly associated with ratings in the lowest quartile on any dimension of provider and health system interactions. Having a high school education was actually associated with a lower probability of ratings in the lowest quartile for trust in the provider and assessment of health plan (having completed some college was associated with a lower probability in the assessment of health plan). A cautious interpretation is that neither non-white race nor low levels of education resulted in an increased probability of low ratings for interactions with providers and health systems. Persons with SLE meeting this study's definition of poverty were more likely to have ratings in the lowest quartile of ratings of their interactions with their health plans. However, poverty was not significantly associated with any other dimension of interactions. Higher levels of disease activity were associated with ratings in the lowest quartile on two dimensions of interactions with

providers (patient-provider communication and trust in provider) and on two dimensions of interactions with health systems (care coordination and assessment of health plan). This suggests that those with higher levels of activity may require more attention and perhaps improved interactions to achieve the goal of patient-centered care.

Patient-centered care is a laudable goal in its own right since good interactions between providers and health systems and patients meet the ethical goal of fostering patient autonomy in health care. However, the quality of interactions may also be a sentinel for the level of the technical quality of care. High levels of technical quality of care have been shown to be associated with quite dramatically lower rates of accumulated damage in SLE [26]. We found that being in the lowest quartile of ratings on each measure of provider and health system interaction was associated with a small decrement in the pass rate for technical quality indicators of the range of two to four points, although these differences were not statistically significant after adjustment; on only one measure, promptness or timeliness of care, was the difference statistically significant before adjustment.

However, consistently good or poor ratings on interactions with providers and health systems were associated with meaningful and statistically significant differences in the pass rate. When persons with SLE rated no dimensions in the lowest quartile, they had pass rates of .71 (95% CI .68-.74) whereas when they rated no fewer than four dimensions in the lowest quartile, pass rates averaged .63 (95% CI .58-.68). Of note, when they rated one to three in the lowest quartile pass rates averaged .70 (95% CI .67-.72), very close to the pass rate when they rated no dimensions that way. This suggests that there may be a threshold at which there is a cumulative impact on technical quality from poor ratings on many dimensions of interactions simultaneously.

The study has some limitations. Because it is cross-sectional, it is possible that the direction of effect runs from poor technical quality of care to low ratings of interactions with providers and health systems. However, the Lupus Outcomes Study is longitudinal. Therefore, in the years to come we will be able to establish whether the ratings of interactions precede the measures of the technical quality of care and if such interactions, like poor technical quality of care, presage worsened outcomes. Another limitation is that the study had limited statistical power to assess the relationship in finer gradations of race/ethnicity, for example whether persons who were from Asian or Hispanic backgrounds rate interactions with providers and health plans differently. Accordingly, when we substituted a five-category measure of race/ethnicity for the principal one, the results did not materially differ.

We did not observe a consistent relationship between race/ethnicity and socioeconomic status and ratings of interactions with providers or health systems in the lowest quartile. In addition, race/ethnicity and poverty were not related to the technical quality of care measure, the overall pass rate. This suggests that interactions with providers and health systems may not be one of the principal mechanisms for the observed disparities in outcomes by these characteristics.

We have observed that persons with SLE generally provide high ratings of patient-provider communication and trust in physicians (two of three dimensions of interactions with providers), with slightly lower ratings of the three dimensions of health systems, and substantially lower ratings of shared decision-making, the third of three provider dimensions. This suggests that active involvement of both provider and patient in treatment decisions may be the final impediment to the goal of achieving patient-centered SLE care. Whether the direction of effect runs from poor interactions with providers and health systems to poorer technical quality of care or the reverse, we have been able to establish that good interactions are intertwined with good technical quality of care. Patient-centered care is a stated goal of health policy, valued for its intrinsic role in establishing patient autonomy. It may also play an important role in establishing the rapport with which to provide high quality care and, thus, improve outcomes in SLE.

Acknowledgments

References

1. Alarcon GS, McGwin G Jr, Bastian HM, et al. Systemic lupus erythematosus in three ethnic groups. VII [correction of VIII]. Predictors of early mortality in the LUMINA cohort. LUMINA Study Group. Arthritis Rheum. 2001; 45:191–202. [PubMed: 11324784]

2. Alarcon GS. Lessons from LUMINA: a multiethnic US cohort. Lupus. 2008; 17:971–976. [PubMed: 18852219]

3. Demas K, Costenbader K. Disparities in lupus care and outcomes. Curr Opin Rheumatol. 2009; 21:102–109. [PubMed: 19339919]

4. Karlson EW, Daltroy LH, Lew RA, et al. The independence and stability of socioeconomic predictors of morbidity in systemic lupus erythematosus. Arthritis Rheum. 1995; 38:267–273. [PubMed: 7848318]

5. Karlson EW, Daltroy LH, Lew RA, et al. The relationship of socioeconomic status, race, and modifiable risk factors to outcomes in patients with systemic lupus erythematosus. Arthritis Rheum. 1997; 40:47–56. [PubMed: 9008599]

6. Sutcliffe N, Clarke AE, Gordon C, et al. The association of socio-economic status, race, psychosocial factors and outcome in patients with systemic lupus erythematosus. Rheumatology (Oxford). 1999; 38:1130–1137. [PubMed: 10556268]

7. Peschken CA, Katz SJ, Silverman E, et al. The 1000 Canadian faces of lupus: determinants of disease outcome in a large multiethnic cohort. J Rheumatol. 2009; 36:1200–1208. [PubMed: 19369456]

8. Yazdany J, Feldman CH, Liu J, et al. Quality of care for incident lupus nephritis among Medicaid beneficiaries in the United States. Arthritis Care Res (Hoboken). 2014; 66:617–624. [PubMed: 24124011]

9. Drenkard C, Rask KJ, Easley KA, et al. Primary preventive services in patients with systemic lupus erythematosus: study from a population-based sample in Southeast U. S Semin Arthritis Rheum. 2013; 43:209–216.

10. Alarcon GS, McGwin G Jr, Sanchez ML, et al. Systemic lupus erythematosus in three ethnic groups. XIV. Poverty, wealth, and their influence on disease activity. Arthritis Rheum. 2004; 51:73–77. [PubMed: 14872458]

11. Trupin L, Tonner MC, Yazdany J, et al. The role of neighborhood and individual socioeconomic status in outcomes of systemic lupus erythematosus. J Rheumatol. 2008; 35:1782–1788. [PubMed: 18634153]

12. Tonner C, Trupin L, Yazdany J, et al. Role of community and individual characteristics in physician visits for persons with systemic lupus erythematosus. Arthritis Care Res (Hoboken). 2010; 62:888–895. [PubMed: 20535800]

13. Ward M. Hospital experience and expected mortality in patients with systemic lupus erythematosus: A hospital level analysis. Journal of Rheumatology. 2000; 27:2146–2151. [PubMed: 10990226]

14. Yazdany J, Trupin L, Tonner C, et al. Quality of Care in Systemic Lupus Erythematosus: Application of Quality Measures to Understand Gaps in Care. J Gen Intern Med. 2012

15. Yazdany J, Panopalis P, Gillis J, et al. A quality indicator set for systemic lupus erythematosus. Arthritis Rheum. 2009; 61:370–377. [PubMed: 19248127]

16. CAHPS. CAHPS Clinician and Group Survey 1.0. Rockville, MD: Agency for Healthcare Research and Quality; 2010.

17. Stewart A, Napoles-Springer A, Perez-Stable E, et al. Interpersonal processes of care in diverse populations. Milbank Quarterly. 1999; 77:305–339. [PubMed: 10526547]

18. Yelin E, Trupin L, Katz P, et al. Work dynamics among persons with systemic lupus erythematosus. Arth Rheum. 2007; 57:56–63. [PubMed: 17266065]

19. Morales LS, Elliott MN, Weech-Maldonado R, et al. Differences in CAHPS adult survey reports and ratings by race and ethnicity: an analysis of the National CAHPS benchmarking data 1. 0. Health Serv Res. 2001; 36:595–617. [PubMed: 11482591]

20. Julian LJ, Gregorich SE, Tonner C, et al. Using the CES-D to screen for depression in SLE. Arthritis Care Res (Hoboken). 2011

21. Ward M. Association between physician volume and in-hospital mortality in patients with systemic lupus erythematosus. Arth Rheum. 2005; 52:1646–1654. [PubMed: 15934091]

22. Yelin E, Trupin L, Katz P, et al. Impact of health maintenance organizations and fee-for-service on health care utilization among people with systemic lupus erythematosus. Arthritis & Rheumatism-Arthritis Care & Research. 2007; 57:508–515. [PubMed: 17394180]

23. Gillis JZ, Yazdany J, Trupin L, et al. Medicaid and access to care among persons with systemic lupus erythematosus. Arthritis & Rheumatism-Arthritis Care & Research. 2007; 57:601–607. [PubMed: 17471527]

24. Yazdany J, Gillis JZ, Trupin L, et al. Association of socioeconomic and demographic factors with utilization of rheumatology subspecialty care in systemic lupus erythematosus. Arthritis & Rheumatism-Arthritis Care & Research. 2007; 57:593–600. [PubMed: 17471526]

25. Ward M, Pyun E, Studenski S. Long-term survival in systemic lupus erythematosus. Patient characteristics associated with poorer outcomes. Arthritis Rheum. 1995; 38:274–283. [PubMed: 7848319]

26. Yazdany J, Trupin L, Schmajuk G, et al. Quality of care in systemic lupus erythematosus: the association between process and outcome measures in the Lupus Outcomes Study. BMJ Qual Saf. 2014

Significance and Innovations

- First use of validated items to assess interactions between patients and providers and health systems in SLE.

- Race/ethnicity and education were not associated with rating in the lowest quartile on any dimension of interactions with provider and health systems, and poverty level incomes were associated only with ratings in the lowest quartile in interactions with health plans.

- Consistently low ratings of interactions with providers and health plans may be an important sentinel for poor technical quality of care, already shown to result in poorer outcomes of SLE.

Table 1

Characteristics of Lupus Outcomes Study Participants with One or More Physician Visits to Main SLE Provider (n=640)

Characteristics	Distribution n (%), unless noted
Demographics	
Age, mean (std)	52.8 (12.6)
Race/Ethnicity	
White	394 (62)
Non-white	246 (38)
Education	
High School graduate or less	115 (18)
Some college/AA degree	242 (38)
Bachelor's degree or higher	283 (44)
Poverty status	
> 125% of Federal Poverty Level	548 (86)
125% of Federal Poverty Level	92 (14)
Lupus Characteristics	
SLAQ - Self-reported disease activity, quartiles	
0 – 5	158 (25)
6 – 9	155 (24)
10 – 15	181 (28)
16+	146 (23)
BILD - Self-reported disease damage, tertiles	
0,1	233 (36)
2,3	191 (30)
> 3	216 (34)
Years since diagnosis, mean (std)	20.1 (8.8)
CES-D - depressive symptoms	
< 24	515 (80)
24	125 (20)
Annual number of MD visits, quartiles	
7	167 (26)
>7 and 11	144 (23)
>11 and 19	169 (26)
>19	160 (25)
Health Care Characteristics	
Kind and source of health insurance	
No Insurance	15 (2)
HMO, public sector	81 (13)
HMO, private sector	119 (19)
Non-HMO, public sector	222 (35)
Non-HMO, private sector	203 (32)

Characteristics	Distribution n (%), unless noted
Kind of Medical Specialists seen in past year	
Other MD Specialist	15 (2)
No Generalist, Rheumatologist	91 (14)
Generalist, No Rheumatologist	87 (14)
Generalist, Rheumatologist	447 (70)
Measures of Interactions (mean, 95% CI) (scale 0–100)	
Provider Measures	
Patient-Provider Communication	90 (89, 91)
Shared Decision-making	43 (41, 46)
Trust	89 (88, 90)
Health System Measures	
Promptness/Timeliness of Care	74 (73, 76)
Care Coordination	77 (75, 79)
Assessment of Health Plan	82 (80, 83)

Table 2

Multivariable model of sociodemographic, SLE-related and health system factors associated with patient experiences of care

Odds ratios (and 95% confidence intervals) for being in lowest quartile of experience of care measures

	Provider measures				System measures	
	Patient-provider communication	Shared decision-making	Trust	Promptness or timeliness of care	Care coordination[2]	Assessment of health plan[3]
Sociodemographic Characteristics						
Age, years (referent: 18–44 yrs)						
45–64	1.11 (0.67, 1.83)	0.88 (0.55, 1.40)	1.53 (0.90, 2.61)	0.70 (0.44, 1.13)	1.11 (0.63, 1.96)	1.01 (0.61, 1.69)
65	0.79 (0.38, 1.63)	**1.98 (1.05, 3.72)**	1.01 (0.47, 2.17)	0.70 (0.36, 1.37)	1.64 (0.77, 3.51)	0.50 (0.24, 1.07)
Non-white race/ethnicity	1.21 (0.80, 1.82)	0.87 (0.59, 1.29)	1.12 (0.73, 1.72)	0.99 (0.66, 1.49)	1.45 (0.92, 2.28)	1.15 (0.75, 1.77)
Education (ref: college graduate)						
High school	0.65 (0.36, 1.16)	0.96 (0.57, 1.61)	**0.55 (0.29, 0.99)**	0.86 (0.49, 1.49)	0.76 (0.41, 1.41)	**0.32 (0.17, 0.60)**
Some college	0.92 (0.60, 1.43)	1.05 (0.69, 1.59)	1.29 (0.83, 2.01)	0.87 (0.57, 1.34)	0.93 (0.57, 1.50)	**0.57 (0.36, 0.89)**
125% Federal Poverty Level	0.89 (0.49, 1.62)	1.68 (0.97, 2.91)	1.40 (0.78, 2.50)	1.16 (0.66, 2.04)	0.86 (0.46, 1.62)	**2.31 (1.31, 4.09)**
SLE Characteristics						
SLAQ score (per 1 SD)	**1.39 (1.09, 1.78)**	1.02 (0.81, 1.29)	**1.40 (1.09, 1.80)**	0.94 (0.73, 1.21)	**1.44 (1.10, 1.88)**	**1.29 (1.01, 1.66)**
Disease duration (per 1 SD)	0.90 (0.73, 1.11)	0.99 (0.82, 1.21)	0.96 (0.77, 1.20)	**0.80 (0.64, 0.99)**	0.88 (0.69, 1.11)	1.01 (0.82, 1.26)
BILD Score (ref: score 1)						
2,3	0.97 (0.60, 1.59)	0.90 (0.57, 1.42)	1.49 (0.90, 2.46)	1.31 (0.81, 2.12)	1.39 (0.81, 2.37)	1.46 (0.88, 2.42)
> 3	1.10 (0.65, 1.88)	1.15 (0.70, 1.89)	1.09 (0.63, 1.91)	**2.13 (1.26, 3.59)**	1.10 (0.61, 2.00)	1.25 (0.72, 2.19)
CES-D score 24	1.42 (0.86, 2.34)	1.26 (0.76, 2.07)	1.39 (0.83, 2.32)	1.50 (0.91, 2.47)	1.14 (0.66, 1.96)	1.26 (0.75, 2.12)
No. of MD visits in year (per 1 SD)	0.88 (0.70, 1.10)	0.81 (0.65, 1.01)	0.89 (0.71, 1.12)	0.84 (0.67, 1.06)	1.04 (0.82, 1.31)	0.96 (0.77, 1.22)
Health Care Characteristics						
Kind of Insurance (ref: non-HMO, private sector)						
No Insurance	1.24 (0.35, 4.34)	1.23 (0.38, 3.92)	1.19 (0.33, 4.24)	0.44 (0.09, 2.09)	1.53 (0.38, 6.12)	
HMO, public sector	2.17 (1.11, 4.25)	0.85 (0.43, 1.68)	1.38 (0.67, 2.82)	0.84 (0.42, 1.70)	0.99 (0.44, 2.23)	1.56 (0.78, 3.09)
HMO, private sector	1.43 (0.83, 2.49)	1.16 (0.69, 1.93)	1.89 (1.08, 3.32)	0.61 (0.34, 1.07)	1.82 (0.97, 3.42)	0.56 (0.30, 1.04)
Non-HMO, public sector	1.07 (0.61, 1.87)	0.83 (0.49, 1.40)	1.10 (0.61, 1.95)	1.08 (0.64, 1.83)	1.77 (0.96, 3.24)	1.03 (0.59, 1.78)
Kind of physicians seen in past year (ref: generalist & rheumatologist)						
Other MD Specialist	0.83 (0.21, 3.25)	2.00 (0.66, 6.02)	1.63 (0.45, 5.91)	0.14 (0.02, 1.13)	0.78 (0.16, 3.95)	0.83 (0.44, 1.54)

Odds ratios (and 95% confidence intervals) for being in lowest quartile of experience of care measures

	Provider measures				System measures		
	Patient-provider communication	Shared decision-making	Trust	Promptness or timeliness of care	Care coordination[2]	Assessment of health plan[3]	
No Generalist, Rheumatologist	0.79 (0.43, 1.44)	1.07 (0.63, 1.84)	0.68 (0.35, 1.30)	0.97 (0.56, 1.69)	1.06 (0.55, 2.03)	1.96 (1.11, 3.46)	
Generalist, No Rheumatologist	1.37 (0.77, 2.41)	1.36 (0.81, 2.31)	1.21 (0.67, 2.16)	1.05 (0.59, 1.86)	1.45 (0.77, 2.72)	0.96 (0.77, 1.22)	

[1] Odds ratios adjusted for all sociodemographic, SLE, and health care characteristics shown.

[2] Care coordination model excludes 27 participants with only one physician.

[3] Health plan assessment model excludes 16 participants without health insurance.

SLAQ = Systemic Lupus Activity Questionnaire; BILD = Brief Index of Lupus Damage; CES-D = Center for Epidemiologic Studies Depression Scale

Table 3

Technical quality of care[1] associated with measures of experience of care with and without adjustment for demographics, SLE status, and health care utilization variables

	Unadjusted	Adjusted[2]
Overall Pass Rate (95% CI)	.70 (.68, .71)	--
Measures of Experiences of Care		
Patient-provider communication		
Quartile 1	.68 (.64, .71)	.67 (.63, .70)
Quartiles 2–4	.70 (.68, .72)	.70 (.68, .72)
Shared decision-making		
Quartile 1	.68 (.65, .71)	.68 (.65, .71)
Quartiles 2–4	.70 (.68, .72)	.70 (.68, .72)
Trust		
Quartile 1	.68 (.65, .72)	.67 (.63, .71)
Quartiles 2–4	.70 (.68, .72)	.70 (.68, .72)
Promptness or timeliness of care		
Quartile 1	**.66 (.63, .70)**	.67 (.64, .70)
Quartiles 2–4	**.70 (.69, .72)**	.70 (.68, .72)
Care coordination		
Quartile 1	.68 (.64, .72)	.66 (.62, .71)
Quartiles 2–4	.70 (.68, .72)	.70 (.68, .72)
Assessment of health plan		
Quartile 1	.68 (.64, .71)	.67 (.64, .71)
Quartiles 2–4	.71 (.69, .72)	.70 (.69, .72)
Combined Measures		
Count of measures with score in lowest quartile		
0	.71 (.68, .74)	**.71 (.68, .74)**
1–3	.70 (.67, .72)	**.70 (.67, .72)**
4–6	.64 (.59, .69)	**.63 (.58, .68)**
Count of provider measures with score in lowest quartile[3]		
0	.70 (.68, .72)	.70 (.68, .72)
1	.70 (.67, .74)	.70 (.67, .74)
2–3	.67 (.63, .70)	.66 (.62, .69)
Count of system measures with score in lowest quartile[4]		
0	.70 (.68, .73)	.70 (.68, .72)
1	.70 (.67, .73)	.70 (.67, .73)
2–3	.66 (.62, .71)	.65 (.60, .69)

[1] Technical quality of care pass rate is the proportion of eligible services received.

[2] Adjusted for age, race/ethnicity, education, poverty status, disease duration, disease activity and damage, CESD, annual number of MD visits, kind and source of insurance, and types of providers seen in past year

[3] Provider measures include communication, shared-decision making, and trust.

⁴System measures include promptness of care, care coordination, and health plan assessment.

Appendix Table 1

Dimensions of Interactions between Patients and Providers and Health Systems from the Consumer Assessment of Health Plans Survey (CAHPS) and Interpersonal Processes of Care Scale (IPC)

Dimension		Rating Scale
Patient-doctor communication (CAHPS)		1 to 4
1.	In the last 12 months, how often did this provider explain things in a way that was easy to understand?	Never 1 Sometimes 2 Usually 3 Always 4
2.	In the last 12 months, how often did this provider listen carefully to you?	
3.	In the last 12 months, how often did this provider interrupt you when you were talking?	
4.	In the last 12 months, how often did this doctor talk too fast when talking with you?	
5.	In the last 12 months, how often did this doctor use medical words you did not understand?	
6.	In the last 12 months, how often were the explanations this doctor gave you hard to understand because of an accent or the way the doctor spoke English?	
7.	In the last 12 months, how often did this doctor ignore what you told him or her?	
8.	In the last 12 months, how often did this doctor use a condescending, sarcastic, or rude tone or manner with you?	
9.	In the last 12 months, how often did this doctor show interest in your questions and concerns?	
10.	In the last 12 months, how often did this provider give you easy to understand information about these health questions or concerns?	
11.	In the last 12 months, how often did this provider show respect for what you had to say?	
12.	In the last 12 months, how often did this provider answer all your questions to your satisfaction?	
13.	In the last 12 months, how often did this provider spend enough time with you?	
14.	In the last 12 months, when this provider ordered a blood test, x-ray, or other test for you, how often did someone from this provider's office follow up to give you those results?	
15.	In the last 12 months, how often did this provider seem to know the important information about your medical history?	

Dimension		Rating Scale
Coordination of Care (CAHPS)		1 to 4
1.	In the last 12 months, how often did your main lupus MD seem informed and up-to-date about the care you got from other doctors?	Never 1 Sometimes 2 Usually 3 Always 4
Promptness or Timeliness of Care (CAHPS)		1 to 4
1.	In the last 12 months, when you phoned this provider's office to get an appointment for care you needed right away, how often did you get an appointment as soon as you needed?	Never 1 Sometimes 2 Usually 3 Always 4
2.	In the last 12 months, when you made an appointment for a check-up or routine care with this provider, how often did you get an appointment as soon as you needed?	
3.	In the last 12 months, when you phoned this provider's office during regular office hours, how often did you get an answer to your medical question that same day?	
4.	In the last 12 months, when you phoned this provider's office after regular office hours, how often did you get an answer to your medical question as soon as you needed?	
5.	In the last 12 months, how often did you see this provider within 15 minutes of your appointment time?	
Shared Decision-making (CAHPS & IPC)*		1 to 2; 1 to 4
1.	In the last 12 months, did anyone in this provider's office talk with you about specific goals for your health?	No 1 Yes 2
2.	In the last 12 months, did anyone in this provider's office ask you if there are things that make it hard for you to take care of your health?	

Dimension		Rating Scale
3.*	*In the last 12 months, how often did the provider ask if you would have any problems following what he or she recommended?*	Never 1 Sometimes 2 Usually 3 Always 4
4.*	*In the last 12 months, how often did the provider ask if you felt you could do the recommended treatment?*	
5.*	*In the last 12 months, how often did you and this provider work out a treatment plan together?*	
6.*	*In the last 12 months, if there were treatment choices, how often did this provider ask if you would like to help decide your treatment?*	

Dimension		Rating Scale
Trust *(CAHPS)*		1 to 3; 1 to 10
1.	In the last 12 months, did you feel you could tell this provider anything, even things that you might not tell anyone else?	Yes, definitely 1 Yes, somewhat 2 No 3
2.	In the last 12 months, did you feel you could trust this provider with your medical care?	
3.	In the last 12 months, did you feel that this provider always told you the truth about your health, even if there was bad	
4.	In the last 12 months, did you feel this provider cared as much as you do about your health?	
5.	In the last 12 months, did you feel this provider really cared about you as a person?	
6.	Using any number from 0 to 10, where 0 means that you do not trust this provider at all and 10 means that your trust this provider completely, what number would you use to rate how much you trust this provider?	0=Don't trust at all to 10=Trust completely
Health Plan *(CAHPS)*		1 to 4; 0 to 10
1.	In the last 12 months, how often was it easy to get the care, tests, or treatment you thought you needed through your health plan?	Never 1 Sometimes 2 Usually 3 Always 4
2.	In the last 12 months, how often did your health plan's customer service give you the information or help you needed?	
3.	In the last 12 months, how often did your health plan's customer service staff treat you with courtesy and respect?	
4.	Using any number from 0 to 10, where 0 is the worst health plan possible and 10 is the best health plan possible, what number would you use to rate your health plan?	0=Worst health plan to 10=Best health plan
5.	In the last 12 months, how often were the forms from your health plan easy to fill out?	Never 1 Sometimes 2 Usually 3 Always 4