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Physician and Patient Moves in the Hospital Do Not Move Patient Satisfaction: A Single-Center Retrospective Analysis

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Physician and Patient Moves in the Hospital Do Not Move Patient Satisfaction: A Single-Center Retrospective Analysis

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Abstract

Background. Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized survey for measuring patient's experiences at US hospitals. There is a shift towards geographically assigning patients and physicians. However, its impact on patient satisfaction scores has not been studied.

Objective: Examine the correlation between patient experience and overall hospital rating with the number of physicians seen and the number of times the patient was moved during a hospitalization.

Methods: A retrospective observational study was performed using select HCAHPS & Press Ganey survey questions to assess physician satisfaction scores and overall hospital rating and recommendation scores.

Results: There was no significant difference across the select survey questions based on the number of times a patient was moved or the hospitalists seen during a hospitalization on most questions. A higher case mix index was associated with an increased likelihood of receiving the highest rating for the hospital (OR 1.39, 95% CI 1.03-1.88), p 0.03), and two other physician communication questions. An increase in the length of stay was associated with a lower likelihood of receiving the highest rating for similar physician communication questions (OR 0.91, 95% CI 0.83 to 0.99, p 0.04)

Conclusions: The number of hospitalists seen by the patient and the number of times a patient is moved during a hospitalization is not associated with physicians related patient satisfaction scores, overall care received in the hospital, or if the patient would recommend the hospital to others.

Keywords

patient satisfaction, HCAHPS, hospital geography, physician satisfaction

Conflict of Interest Statement

None of the authors have a conflict of interest

Introduction

Since 2006, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized survey instrument and data collection methodology for measuring patient's experiences at US hospitals¹. The goals of HCAHPS are 3-fold: to support consumer choice, to incentivize hospitals to improve care quality, and to enhance transparency, leading to increased accountability². The Affordable Care Act of 2010 enacted the Hospital Value-Based Purchasing (HVBP) program, in which the Centers for Medicare & Medicaid Services (CMS) partially links payments to Acute Care Inpatient Prospective Payment System hospitals based on the HCAHPS measures³.

There is currently a shift towards geographically assigning patients and physicians, which has demonstrated improved patient knowledge, perception of physician time spent with the patient, improved continuity of care, and provider satisfaction⁴. However, its impact on patient satisfaction scores has not been studied yet. Patients are often moved within the hospital based on changes in their diagnosis or clinical stability. If hospitalists are assigned geographically, these patient moves can result in several different attending physicians responsible during a given admission.

We hypothesized that the fewer physicians a patient sees and the less frequently they are transferred within the hospital, the higher their satisfaction with their care.

Methods

Our study is a retrospective, observational study. From the Press Ganey database, we obtained records of 2113 patients cared for by the hospitalist group at Rochester General Hospital, Rochester, New York, between January 1, 2017, through December 31, 2017.

At Rochester General Hospital, our hospitalist model consists of dedicated rounding and admitting teams. Our hospitalists work in a hybrid schedule with around 75% of them working in a 7 on 7 off schedule and 25% working on a Monday-Friday schedule. A rounding physician continues to follow their patient unless they are transferred to specific team based geographical floors upon which the patients are reassigned to the provider on that floor.

Using Microsoft excel, we randomly selected 300 survey results from the database. Using our electronic medical records system, we reviewed each patient chart for age, gender, race, length of stay (LOS), case mix index (CMI), number of floor changes, number of attending hospitalists, and consultants seen during the hospitalization. We used three physician-centric HCAHPS and five Press Ganey survey questions to assess patient satisfaction scores. We used two HCAHPS and four Press Ganey survey questions to assess overall hospital rating and

recommendation scores (Appendix 1). The institutional review board at Rochester General Hospital approved the study protocol.

Statistical Analysis

The study was powered at 0.90, effect size 0.5 (moderate), alpha error 0.05 for allocation ratio of 4.33 for the number of floor changes variable, and an allocation ratio of 1.96 for the number of hospitalist changes. The study's power was appropriate to detect a 1 point difference in hospital rating scores and 0.5 point difference for the rest of hospital and physician satisfaction scores. The power of study calculations was made with the help of G*Power Version 3.1.9.6.

We performed the Wilcoxon Mann Whitney test, Spearman's rank-order correlation, and binary logistic regression with proportional odds with the primary effect function on the data using IBM SPSS statistics version 26.0.0.0.

We performed analysis, including incomplete surveys and excluding incomplete surveys. The results reported in this article include incomplete surveys.

Results

Of the 300 surveys analyzed, one survey did not have any patient satisfaction questions answered and was excluded from the data analysis. Fewer than 10% of survey responses were incomplete for all variables. The distribution of the responses to the survey questions was positively skewed. The average age of the patient was approximately 70 years. The majority of the patients were white (n=252, 85.4%). African Americans and Hispanics constituted 7.5 % (n=22) and 2.4 % (n=7) of total patients, respectively. 53% (n=159) were females.

The mean number of floor changes, attending hospitalists, and consultants seen during the hospitalization were 1.15, 2.37, and 1.13, respectively. The average length of stay (LOS) and case mix index (CMI) were 4.38 days and 1.47, respectively. Only 2 % (n=9) of the patients had a LOS>14 days (Table1).

| Table 1. Descriptive Statistics | | | | |
|---|---------------------------|-------------|---------------|-----------|
| Variable | Number of patients | Mean | Median | SD |
| LOS | 299 | 4.38 | 3 | 4.43 |
| CMI | 295 | 1.47 | 1.03 | 1.21 |
| Age (years) | 299 | 70.43 | 72 | 14.53 |
| No. of floor changes | 299 | 1.15 | 1 | 0.69 |
| No. of Hospitalist during hospitalization | 299 | 2.37 | 2 | 1.05 |
| No. of consult during hospitalization | 299 | 1.13 | 1 | 0.98 |
| <i>Note: LOS- Length of Stay, CMI- Case-mix index, SD- Standard Deviation</i> | | | | |

We dichotomized the data by dividing the number of floor transfers into low (0-1) and high (≥ 2) floor change groups. We had 243 (81%) patients in the low and 56(19%) patients in high floor transfer groups, respectively. In the low floor change group, 11.9% of patients did not have any floor change. In the high floor changes group, 71.4% had two changes, 21.4% had three changes, and 7.1% had four changes. Both groups were similar in terms of patient demographics, language, insurance, and the number of hospitalists seen during the hospitalization. The two groups were significantly different in terms of LOS (median of 3 vs. 5, $p < 0.05$), CMI (median 1.02 vs. 1.34, $P < 0.05$), and the number of consultants during hospitalization (median of 1 vs. 2, $p < 0.05$) (Table 2).

There was no significant difference between the groups across 14 different physician satisfaction and hospital ranking/ recommendation questions on the Wilcoxon Mann Whitney test (Table 2). The results were similar after excluding incomplete surveys and after excluding zero floor changes from the analysis. Similarly, we divided the number of hospitalists seen by a patient during a hospitalization into low (≤ 2) and high hospitalist change groups (≥ 3). The median for low and high hospitalist change groups was 2 and 3, respectively. The two groups were similar in terms of patient demographics, number of floor changes, language spoken, education, insurance carrier, and the number of consultants seen during the hospitalization. The two groups differed in the median LOS (3 vs. 5, $p < 0.05$) and median CMI (0.99 vs. 1.1 $p < 0.05$). Similar to the floor changes results, there was no significant difference between the groups across 14 different physician satisfaction and hospital recommendation and ranking questions on the Wilcoxon

Mann Whitney test (Table 3) with and without the incomplete surveys. We also analyzed the data using the Chi-square test by dividing the survey responses into dichotomous variables (highest rating vs. all others). The result was similar to the Wilcoxon Mann Whitney test.

| Table 2. Comparison of low floor change and high floor change group | | | | | | | |
|--|--|--------|-------|--|--------|-------|---------|
| | Zero to one-floor changes during hospitalization (Low floor changes group) (n 243) | | | Two and more floor changes during the hospitalization (High floor changes group)(n 56) | | | p-value |
| | Mean | Median | SD | Mean | Median | SD | |
| LOS | 3.84 | 3 | 3.99 | 6.71 | 5 | 5.45 | <0.05 |
| CMI (n=239 and 56) | 1.38 | 1.02 | 1.07 | 1.84 | 1.34 | 1.64 | <0.05 |
| Age | 70.46 | 73.0 | 14.95 | 70.28 | 71.50 | 12.67 | >0.05 |
| No of floor changes | 0.88 | 1 | 0.32 | 2.35 | 2 | 0.61 | <0.05 |
| No of hospitalist during admission | 2.31 | 2 | 0.86 | 2.64 | 2 | 1.63 | >0.05 |
| No of consult during admissions | 1 | 1 | 0.90 | 1.69 | 2 | 1.11 | 0.05 |
| How will you rate the hospital on a grade of 0 to 10? | 8.93 | 9 | 1.61 | 8.79 | 9 | 1.67 | >0.05 |
| Would you recommend this hospital (1 to 4)? | 3.66 | 4 | 0.58 | 3.65 | 4 | 0.58 | >0.05 |
| How often did doctors treat you with courtesy and respect (1 to 4)? | 3.84 | 4 | 0.43 | 3.82 | 4 | 0.5 | >0.05 |
| How often doctors listen carefully to you (1 to 4)? | 3.7 | 4 | 0.56 | 3.64 | 4 | 0.74 | >0.05 |
| How often doctors explain things in a way you could understand (1 to 4)? | 3.66 | 4 | 0.61 | 3.64 | 4 | 0.58 | >0.05 |
| Time physician spent with you (1 to 5) | 4.38 | 5 | 0.78 | 4.36 | 5 | 0.75 | >0.05 |
| Physician's concern for your questions and worries (1 to 5) | 4.41 | 5 | 0.80 | 4.33 | 4 | 0.70 | >0.05 |
| How well the physician kept you informed (1 to 5)? | 4.45 | 5 | 0.81 | 4.37 | 4.5 | 0.7 | >0.05 |
| Friendliness/courtesy of physician (1 to 5) | 4.59 | 5 | 0.72 | 4.59 | 5 | 0.59 | >0.05 |
| Skill of physician (1 to 5) | 4.68 | 5 | 0.62 | 4.66 | 5 | 0.54 | >0.05 |
| Extent to which you felt ready to be discharged (1 to 5) | 4.52 | 5 | 0.79 | 4.53 | 5 | 0.76 | >0.05 |
| How well the staff worked together to care for you (1 to 5)? | 4.55 | 5 | 0.65 | 4.61 | 5 | 0.62 | >0.05 |
| Likelihood of your recommending this hospital to others(1 to 5) | 4.60 | 5 | 0.68 | 4.71 | 5 | 0.53 | >0.05 |
| Overall rating of care given at hospital (1 to 5) | 4.56 | 5 | 0.74 | 4.69 | 5 | 0.61 | >0.05 |

Table 3. Comparison of low hospital changes with high hospitalist changes

| | 2 or fewer attending hospitalists during the hospitalization (low hospitalist changes group)(n= 198) | | | 3 or more hospitalist during hospitalization((High hospitalist changes group)(n=101) | | | p-value |
|--|--|--------|-------|--|--------|-------|---------|
| | Mean | Median | SD | Mean | Median | SD | |
| LOS | 2.96 | 3 | 1.84 | 7.14 | 5 | 6.35 | <0.05 |
| CMI | 1.35 | 0.99 | 1.01 | 1.7 | 1.1 | 1.5 | <0.05 |
| Age | 69.28 | 71 | 15.22 | 72.67 | 75 | 12.85 | >0.05 |
| No of floor changes | 1.09 | 1 | 0.56 | 1.28 | 1 | 0.89 | >0.05 |
| No of hospitalist during admission | 1.78 | 2 | 0.40 | 3.52 | 3 | 0.98 | <0.05 |
| No of consult during admissions | 1.07 | 1 | 0.9 | 1.24 | 1 | 1.05 | >0.05 |
| Rating of the hospital (scored on 1 to 11 rather than 0 to 10) | 8.78 | 9 | 1.65 | 8.9 | 9 | 1.57 | >0.05 |
| Would you recommend this hospital (1 to 4) | 3.6458 | 4 | 0.59 | 3.7 | 4 | 0.55 | >0.05 |
| How often did doctors treat you with courtesy and respect (1 to 4) | 3.8367 | 4 | 0.45 | 3.85 | 4 | 0.43 | >0.05 |
| How often doctors listen carefully to you(1 to 4) | 3.65 | 4 | 0.64 | 3.76 | 4 | 0.51 | >0.05 |
| How often doctors explain things in a way you could understand(1 to 4) | 3.64 | 4 | 0.63 | 3.69 | 4 | 0.56 | >0.05 |
| Time physician spent with you (1 to 5) | 4.36 | 5 | 0.77 | 4.40 | 5 | 0.78 | >0.05 |
| Physician's concern for your questions and worries (1 to 5) | 4.36 | 5 | 0.79 | 4.45 | 5 | 0.76 | >0.05 |
| How well the physician kept you informed (1 to 5) | 4.42 | 5 | 0.79 | 4.46 | 5 | 0.78 | >0.05 |
| Friendliness/courtesy of physician (1 to 5) | 4.55 | 5 | 0.74 | 4.68 | 5 | 0.61 | >0.05 |
| skill of physician (1 to 5) | 4.63 | 5 | 0.66 | 4.76 | 5 | 0.45 | >0.05 |
| Extent to which you felt ready to be discharged (1 to 5) | 4.48 | 5 | 0.82 | 4.61 | 5 | 0.69 | >0.05 |
| How well staff worked together to care for you(1 to 5) | 4.53 | 5 | 0.65 | 4.62 | 5 | 0.62 | >0.05 |
| Likelihood of your recommending this hospital to others(1 to 5) | 4.64 | 5 | 0.60 | 4.6 | 5 | 0.76 | >0.05 |
| Overall rating of care given at hospital (1 to 5) | 4.54 | 5 | 0.75 | 4.67 | 5 | 0.62 | >0.05 |

On the application of Spearman's rank-order correlation when comparing low and high hospitalist changes, a positive correlation was noted with the CMI and the following questions:

- a. What number would you use to rate this hospital during your stay (rs 0.155, p 0.008),
- b. How often doctors explain things in a way you could understand (rs 0.136, p 0.023),
- c. How well the physician kept you informed (rs 0.172, p 0.004),
- d. Friendliness/courtesy of physician(rs0.137, p 0.022),
- e. The skill of the physician (rs 0.127, p 0.035),
- f. The extent to which you felt ready to be discharged (rs 0.198,p 0.001).

A similar positive correlation was noted between the higher number of consultants seen during the hospitalization and the questions on:

- a. Physician's concern for your questions and worries (rs 0.137, p 0.023),
- b. The extent to which you felt ready to be discharged (rs 0.153, p 0.010),
- c. How well the staff worked together to care for you (rs 0.143, p 0.016).

There was no statistically significant correlation between LOS and patient satisfaction with physicians or the patient's hospital rating/recommendation questions on univariate analysis.

We performed a binomial logistic regression analysis to ascertain the effect of CMI, LOS, number of floor changes, hospitalists, and consultants on the likelihood of receiving the highest rating on the survey while controlling for them. A higher CMI was associated with an increased likelihood of receiving the highest rating for the following questions:

- a. How will you rate the hospital (Odds ratio (OR) 1.39,95% CI 1.03-1.88, p 0.03),
- b. How often doctors explain things in a way you could understand (OR 1.51,95% CI 1.04 to 2.19, p 0.03),
- c. How well the physician kept you informed (OR 1.32,95% CI 1.01 to 1.73, p 0.03).

An increase in the LOS was associated with a lower likelihood of receiving the highest rating for the questions how well the physician kept you informed (OR 0.91, 95% CI 0.83 to 0.99,p 0.04) and friendliness/courtesy of physician (OR 0.9,95% CI 0.83 to 0.99, p 0.02).

A higher number of floor changes were associated with a decreased likelihood of receiving the highest rating for the question physician's concern for your questions and worries (OR 0.68, 95% CI 0.47 to 0.99,p 0.045).

The higher number of hospitalists seen during the hospitalization was associated with a higher likelihood of receiving the highest rating for the Press Ganey survey on the rating of care at the hospital (OR 1.42, 95% CI 1.01 to 2, p 0.04) but not for a similar HCAHPS question (OR 1.29, 95 % CI 0.93 to 1.79).

A higher number of consultants seen during the admission were associated with a higher likelihood of receiving the highest rating for the questions physician's concern for your questions and worries (1.42,95% CI 1.03 to 1.96, p 0.03), the extent to which you felt ready to be discharged (1.67, 95% CI 1.18 to 2.38, p 0.004), how well the staff worked together to care for you (OR 1.47,1.05 to 2.05, p 0.02) and for recommending this hospital to others on the Press Ganey survey question (OR1.45, 95 % CI 1.02 to 2.06, p 0.03) but not for a similar HCAHPS question (1.09,95 % CI 0.78 to 1.52, P 0.59).

Discussion

Interventions such as multidisciplinary rounds and geographic localization of patients and staff have improved the perception of teamwork and staff communication⁴. Patients are most satisfied when they feel that a doctor understands their concerns and can effectively communicate regarding their diagnosis and treatment^{5,6}. Patients are dissatisfied when they are made to wait without explanation, moved to different wards, and when they felt invisible to the healthcare staff⁷.

Our study demonstrated that the number of times a patient was moved between floors and the number of hospitalists seen during an admission did not affect 14 different physician satisfaction and hospital ranking/ recommendation questions without adjusting for CMI or LOS.

When adjusted for other independent variables, an increase in the number of hospitalists was not associated with a change in physician or hospital satisfaction metrics except for the rating on the hospital's care on the Press Ganey survey but not the HCAHPS survey. The lower end of 95% CI for the OR was 1.01. This result is similar to a retrospective study by Turner et al. that found no statistical significance between the total number of unique hospitalist physicians and patient satisfaction scores³.

Similarly, the frequency of floor changes was not associated with a significant change in physician or hospital satisfaction metrics barring perception of physician concern where there was a negative association after controlling for other independent variables. The higher end of the confidence interval for the odds ratio was 0.99. As other physician satisfaction metrics were not affected by the floor changes, and the odds ratio is close to 1, we question this finding's significance.

Interestingly, after adjusting for other independent variables, a higher CMI was associated with a higher hospital ranking and better perception of physician communication by patients. A similar effect of CMI on Medicare star ratings for

the patient experience was observed in another study⁸. CMI is used as an indicator of the severity of illness in the hospital; however, it does have limitations⁹. CMI is determined from the diagnosis-related group (DRG), which can be higher for patients undergoing procedures like cardiac angiogram, appendectomy, cholecystectomy, to name a few. Patients with a higher CMI but not seriously ill likely underwent a procedure leading to a better outcome and, subsequently, better satisfaction scores¹⁰. We also hypothesize that a higher CMI predicts a higher patient severity, which sets a lower expectation/reference point for patients and families with the patient's overall hospital course. It is similar to what has been observed in other consumer marketing and cognitive studies done in the non-medical field^{11,12}. It also reflects a more complicated hospitalization requiring more frequent communication with patients and family and a multidisciplinary approach, including more consultations with other sub-specialties leading to higher patient satisfaction scores and recommendations. Such a patient going home instead of a rehabilitation facility is perhaps a more satisfying outcome for the patient and their family, leading to improved patient satisfaction with their physicians and overall care they have received at the hospital.

An increase in LOS adjusted for other independent variables was negatively associated with the hospital's rating, physician communication, and physician's friendliness. A similar negative association between LOS and patient satisfaction scores was observed in lung cancer patients after resection and lumbar spine surgery patients attributed to unanticipated poor outcomes.¹³

In our study, an increase in the number of consultants after controlling for other independent variables was positively associated with improved perception of physician concern, readiness for discharge, staff working together, and overall hospital recommendation, which was an unexpected finding. A study by Rohtagi et al. on co-management of the surgical patients by hospitalists with an orthopedic consultant did not show a significant change in patient satisfaction¹⁴. We did not find any other study that evaluated consultants' effect on patient satisfaction of hospitalist-covered patients. The possible reasons for this finding could be improved perception of care if a specialist was involved and reinforcement of discharge readiness by the specialist. It will be interesting to see if this finding is replicated in future studies.

There are several limitations to our study. Our study was a single-center retrospective observational study. Our sample size is small and was powered to detect a 1.0 point difference in hospital rating and 0.5 points in the rest of the variables. We included incomplete surveys to achieve our targeted sample size. However, removing incomplete surveys did not change the study results. Some of the odd ratios have 95 % CI close to 1, raising the possibility of false-positive results. We identified questions on the survey that the physician's role could have impacted. However, the other aspects of care received during hospitalization, like

nursing, food, hospitality, and the hospital's overall ambiance, could have made a difference. These patients may have also been seen by a medical resident and advanced practice practitioners and their impact on these scores, if any, are not known.

Conclusion

The number of hospitalists seen by the patient and the number of times a patient is moved during a hospitalization is not associated with physician-related patient satisfaction scores, overall care received in the hospital, or if the patient would recommend the hospital to others. A higher case mix index and more consultants during hospitalization were associated with improvement in specific satisfaction metrics and hospital ranking. In contrast, an increased length of stay was associated with worse performance on specific satisfaction metrics and hospital ranking.

References

1. Giordano, L. A., Elliott, M. N., Goldstein, E., Lehrman, W. G., Spencer, P. A., Development, Implementation, and Public Reporting of the HCAHPS Survey. *Medical care research and review*. 2009; 67: 27-37.
2. Geiger, N. F., On Tying Medicare Reimbursement to Patient Satisfaction Surveys. *The American journal of nursing*. 2012; 112: 11.
3. Turner, J., Hansen, L., Hinami, K., et al., The Impact of Hospitalist Discontinuity on Hospital Cost, Readmissions, and Patient Satisfaction. *JGIM*. 2014; 29: 1004-1008.
4. O'Leary, K. J., Wayne, D. B., Landler, M. P., et al., Impact of Localizing Physicians to Hospital Units on Nurse—Physician Communication and Agreement on the Plan of Care. *Journal of general internal medicine: JGIM*. 2009; 24: 1223-1227.
5. Greco, M., Brownlea, A., McGovern, J., Cavanagh, M., Consumers as Educators: Implementation of Patient Feedback in General Practice Training. *Health communication*. 2000; 12: 173-193.
6. Davidson, K. W., Shaffer, J., Ye, S., et al., Interventions to improve hospital patient satisfaction with healthcare providers and systems: a systematic review. *BMJ Quality & Safety*. 2017; 26: 596-606.
7. Lane, J. V., Hamilton, D. F., MacDonald, D. J., Ellis, C., Howie, C. R., Factors that shape the patient's hospital experience and satisfaction with lower limb arthroplasty: an exploratory thematic analysis. *BMJ Open*. 2016; 6: e010871.
8. Trzeciak, S., Gaughan, J. P., Bosire, J., Angelo, M., Holzberg, A. S., Mazzairelli, A. J., Association Between Medicare Star Ratings for Patient Experience and Medicare Spending per Beneficiary for US Hospitals. *Journal of patient experience*. 2017; 4: 17-21.
9. Mendez, C. M., Harrington, D. W., Christenson, P., Spellberg, B., Impact of Hospital Variables on Case Mix Index as a Marker of Disease Severity. *Population health management*. 2014; 17: 28-34.
10. Kennedy, G. D., Tevis, S. E., Kent, K. C., Is There a Relationship Between Patient Satisfaction and Favorable Outcomes? *Annals of surgery*. 2014; 260: 592-600.

11. Priscilla A. LaBarbera, David Mazursky, A Longitudinal Assessment of Consumer Satisfaction/Dissatisfaction: The Dynamic Aspect of the Cognitive Process. *Journal of marketing research*. 1983; 20: 393-404.
12. Singh, J., Widing, R. E., What Occurs Once Consumers Complain? A Theoretical Model for Understanding Satisfaction Dissatisfaction Outcomes of Complaint Responses. *European Journal of Marketing*. 1991; 25: 30-46.
13. Smith, G. A., Chirieleison, S., Levin, J., et al., Impact of length of stay on HCAHPS scores following lumbar spine surgery. *Journal of Neurosurgery and Spine*. 2019; 31: 366-371.
14. Rohatgi, N., Loftus, P., Grujic, O., Cullen, M., Hopkins, J., Ahuja, N., Surgical Comanagement by Hospitalists Improves Patient Outcomes: A Propensity Score Analysis. *Annals of Surgery*. 2016; 264: 275-282.

Appendix 1

Physician Satisfaction questions

A. HCAHPS questions:

1. During this hospital stay, how often did doctors treat you with courtesy and respect? (Never, sometimes, usually, always)
2. During this hospital stay, how often did doctors listen carefully to you? (Never, sometimes, usually, always)
3. During this hospital stay, how often did doctors explain things in a way you could understand? (Never, sometimes, usually, always)

B. Press Ganey questions:

1. Time physician spent with you (very poor, poor, fair, good, very good)
2. Physician concern for your questions and worries ((very poor, poor, fair, good, very good)
3. How well the physician kept you informed(very poor, poor, fair, good, very good)
4. Friendliness/courtesy of physician(very poor, poor, fair, good, very good)
5. The skill of Physician(very poor, poor, fair, good, very good)

Hospital rating and recommendation questions

A. HCAHPS questions:

1. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, what number would you use to rate this hospital during your stay?
2. Would you recommend this hospital to your friends and family? (Definitely no, probably no, probably yes, definitely yes)

B. Press Ganey questions:

1. The extent to which you felt ready to be discharged(very poor, poor, fair, good, very good)
2. How well the staff worked together to care for you? (very poor, poor,fair,good,very good)
3. Likelihood of your recommending the hospital to others (very poor, poor, fair, good, very good)
4. Overall rating of care given at the hospital (very poor, poor, fair, good, very good)