Wait Times, Patient Satisfaction Scores, and the Perception of Care

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Objectives

To analyze the impact of waiting time on patient satisfaction scores; not only of satisfaction with the provider in general, but also with the specific perception of the quality of care and physician abilities.

Study Design

Using surveys regarding patient satisfaction with provider care, data was collected from a sample of 11,352 survey responses returned by patients over the course of 1 year across all 44 ambulatory clinics within a large academic medical center. While a small minority of patients volunteered identification, the surveys were made anonymously.

Methods

A questionnaire with Health Consumer Assessment of Healthcare Providers and Systems patient satisfaction and waiting time queries was administered via mail to all clinic patients—roughly 49,000—with a response rate of 23%. Employing a standard statistical approach, results were tabulated and stratified according to provider scores and wait time experience, and then analyzed using statistical modeling techniques.

Results

While it is well established that longer wait times are negatively associated with clinical provider scores of patient satisfaction, results indicated that every aspect of patient experience—specifically confidence in the care provider and perceived quality of care—correlated negatively with longer wait times.

Conclusions

The clinical ambulatory patient experience is heavily influenced by time spent waiting for provider care. Not only are metrics regarding the likelihood to recommend and the overall satisfaction with the experience negatively impacted by longer wait times, but increased wait times also affect perceptions of information, instructions, and the overall treatment provided by physicians and other caregivers.

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With the paradigm of healthcare solutions becoming increasingly consumer-driven, and with an age of personalized and customized treatments on the horizon, the need to provide not just quality care but overall patient satisfaction is becoming more important by the day.[1] The changing tides of the healthcare landscape have been well researched, and the Institute of Medicine's report "Crossing the Quality Chasm" outlines a framework of guiding principles to staying ahead in a more competitive healthcare economy. One of these 6 principles is the ability to provide timely care that reduces harmful delays.[2] Wait times can manifest in a variety of ways, including delays in scheduling either for testing, procedures, or physicians themselves, as well as wait times in the office or emergency department (ED). Of these, time spent waiting for a scheduled appointment is the largest source of patient dissatisfaction.

Time spent in a care provider's office can be divided into a number of distinct segments. First, the patient spends time in a "waiting room." Second, they are placed in a queue to be brought back to the "exam room," where, after some initial screening, the patient awaits the arrival of the primary healthcare provider, usually a physician. The third segment is the examination and consultation. From the patient's perspective, the first 2 segments should be minimized, and the final segment—time spent with the physician—maximized.

Various instruments have been used to measure patient satisfaction, but patients' perspectives on hospital care are currently measured by a national standardized survey instrument called the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).[3] The survey used in this study was administered by Press Ganey, an independent firm that offers the nation's largest comparative customer feedback databases, and is an approved HCAHPS survey vendor. The survey focused on the patient perspective on care received in a physician's office, as measured by 46 different metrics.[4]

It is easy to intuit that a review of patient satisfaction scores would reveal a negative correlation between wait time

Take-Away Points

The ambulatory patient experience is heavily influenced by time spent waiting for provider care. It is easy to intuit that overall satisfaction with the experience is negatively impacted by longer wait times, but increased wait times also affect perceptions of the information, instructions, and treatment provided by healthcare providers. Our study will aid clinicians in the following regards:

- New statistical and segmental approaches to satisfaction score analysis;
- New findings on the importance of patient throughput;
- New recommendations for maintaining a competitive edge in an increasingly consumer-driven healthcare marketplace.

and general patient satisfaction. A literature review of patient satisfaction reports in emergency departments EDs found that satisfaction was associated with 3 key aspects, namely provider-patient interaction, patient-specific characteristics, and perceived waiting times.[5] Furthermore, a recent study performed in 2 family practice clinics found that the majority of patients who waited less than 10 minutes gave an excellent or good rating, while only a minority gave this rating after waiting longer than 20 minutes.[6] The negative relationship between time spent waiting and overall patient satisfaction has been well documented, and case studies of specific procedural strategies to decrease wait times have been shown to abate low satisfaction scores.[7-10] This analysis, however, reveals a new wrinkle we find both interesting and pertinent to care providers and clinic management.

In this study, we assess the relationships between reported wait times and various measures of satisfaction across the ambulatory centers of a large academic medical center in the Midwestern United States, as surveyed independently by Press Ganey. With a particular interest in both the likelihood of the patient to refer the facility, and in the perceived quality of care, we analyzed and assessed the impact of wait times on patient satisfaction scores, looking to compare scores on general satisfaction with the appointment experience to metrics specific to physician performance and confidence in the care provider. While it is intuitive that a patient would be less satisfied with the office visit upon an extended wait, we examined if the perception of the provider's competence would also be affected.

METHODS

The academic medical center used the Press Ganey[4] HCAHPS survey tool to collect data on the satisfaction with the care received by ambulatory patients at all of the 44 disparate clinics within the medical center system during the period from January 1, 2008, to December 31, 2008. All patients were sent a survey in the mail following an outpatient visit. The survey contained 46 questions regarding demographic information, time spent waiting before receiving care, and satisfaction with the visit. Satisfaction questions were related to the quality of the care and of the care provider, as well as the experience from an operational standpoint. The respondents evaluated their satisfaction using a Likert scale, with following designations: 1–very poor; 2–poor; 3–fair; 4–good; and 5–very good. The overall response rate to the questionnaire was 23.06%, totalling 11,352 respondents. Of those, there were 9945 unique patients and 1407 patients with multiple responses. Multiple responses from the same patient were tallied; which while not significant on its own, this could have potentially contributed to positive skew.

Of the 46 survey questions measuring the satisfaction with the visit, we chose to assess responses to 13 questions on clinical care received and on the clinical staff. Table 1 provides the question text and question identification used throughout the paper when discussing study results.

Statistical analysis began after the surveys were collected. We employed univariate and multivariate association tests and statistical modeling techniques to identify individual factors associated with significantly lower or higher evaluations of the clinical care received, while evaluating the joint effects of these factors on patient satisfaction. Specifically, we began our analyses by using the χ^2 test on the assumption that there was no association between the satisfaction scores given for each of the 13 questions and the following set of potential explanatory variables:

- Time in the waiting room, categorized into 5 groups: 0 to 5 minutes, 6 to 10 minutes, 11 to 15 minutes, 16 to 30 minutes, and more than 30 minutes;
- Time in the exam room, categorized into the same 5 groups;
- Combined time, with the cut points doubled from those used for the 2 individual times;
- Gender;
- Age, grouped into 5 categories: 18 years and younger, 19-29 years, 30-39 years, 40-49 years, and 50 years and older;
- A binary variable denoting first visits;
- A binary variable for self-filling.

To further study the effects of the waiting times and other explanatory factors on the ordinal satisfaction scores, and to assess the relationships using a model specification which allowed the slope vector to vary for each of the categories considered, we fitted 4 separate equations with a binary response variable. For discussion purposes, however, we report the results of the univariate logistic regression for 1 equation only—the probability that the satisfaction score given equals 5. Since the score of 5 was the median for each study question, we can more easily assess quality of care by treating the satisfaction score as a binary variable with scores of 5 mapped into a value of 1, and the lesser satisfaction scores treated as zeroes.

We expanded our univariate study of the relationships by considering multiple explanatory variables in the logistic regression setting. When choosing adequately fitting models, we included either the combined waiting time or both the exam and waiting room times. However, when including the combined time only in the set of explanatory factors, we did not want to lose the relevant information contained in the distinction between waiting and exam room portions. Hence, we added a new explanatory variable that measured the percentage of time the patient spent waiting in the waiting room. Finally, we also considered interactions between waiting times, age, whether it was the first visit, and self-filling indicators. We used a backwards elimination approach in our stepwise multiple regression models to select the final regression models.

Table 1. Survey Questions, With Their Corresponding "Question ID" Regarding Satisfaction With the Care Received During an Outpatient Visit

Question ID	Question Description
cp1	Friendliness/courtesy of the care provider
cp2	Explanations the care provider gave you about your problem or condition
cp3	Concern your care provider showed for your questions or worries
cp4	Care provider's efforts to include you in decisions about your treatment
cp5	Information your care provider gave you about medications (if any)
cp6	Instructions your care provider gave you about follow-up care (if any)
cp7	Degree to which care provider talked with you using words you could understand
cp8	Amount of time the care provider spent with you
cp9	Your confidence in the care provider
cp10	Likelihood of recommending your care provider to others
n1	Friendliness/courtesy of the nurse/assistant
o3	Care received during your visit
o4	Likelihood of recommending practice

RESULTS

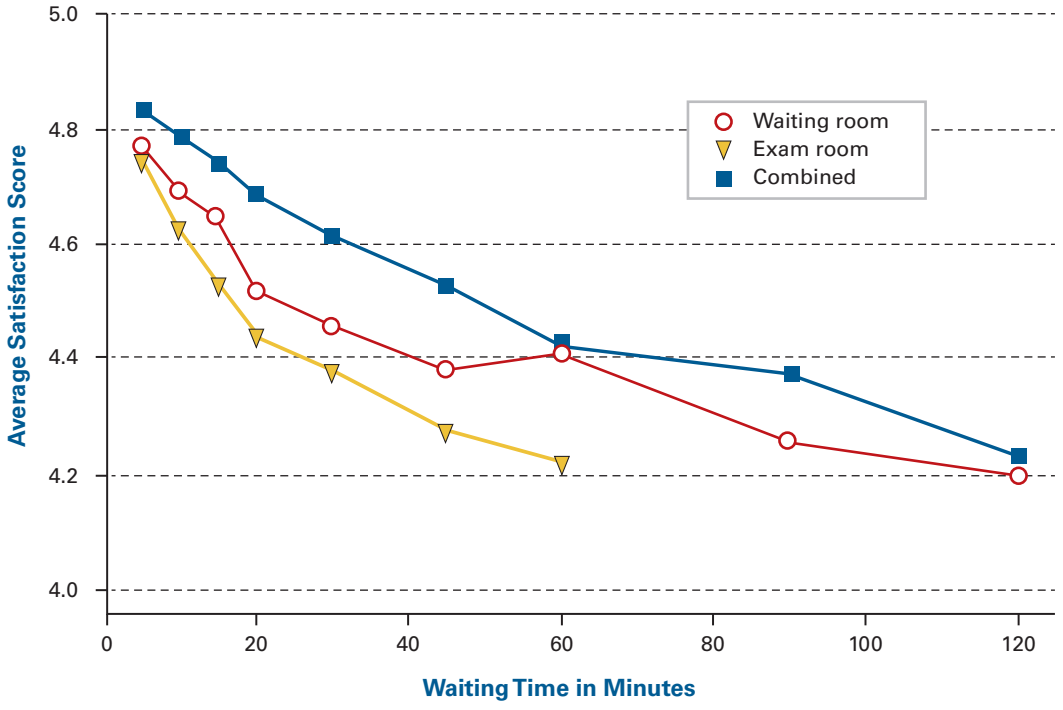
Summary Statistics and Graphical Assessment

The summary statistics in Table 2 provide insight into the distribution of the waiting time variables and selected demographic characteristics. The waiting times exhibit extreme positive skew. For example, 1 respondent reported a wait of 1415 minutes (23.6 hours) in the waiting room and exam room before being seen—clearly a statistical outlier that exemplifies the positive direction of the skew. Hence, when analyzing the effects of waiting times on satisfaction scores, we truncated the waiting room times at 120 minutes and exam room waiting times at 60 minutes. On average, respondents waited about 23 minutes in the waiting room and 15 minutes in the exam room.

Table 2. Summary Statistics for Key Study Variables and Demographic Information

Variable	Valid Responses	Min	Max	Mean	Median	Standard Deviation
Waiting Time Questions						
Waiting time: waiting room (minutes)	10,715	0	900	22.80	15	43.13
Waiting time: exam room (minutes)	10,700	0	802	15.39	10	35.84
Total waiting time (minutes)	10,492	0	1415	37.99	25	61.05
Demographic Questions						
Age (y)	11,352	0	98	47.40	53	23.03
Binary Demographic Questions	**Valid Responses**	**%**	**n**			
First visit (yes)	10,991	25	2749			
Gender (male)	11,349	38	4310			
Self-filling (yes)	11,352	70	7958			

Figure 1. The Relationships Between Waiting Times and Average Satisfaction Scores Across All 13 Study Questions



Data was mapped for time spent in the waiting room and time spent in the exam room, as well as the combined waiting time.

Before performing quantitative analyses, we examined the relationships between the satisfaction scores and explanatory variables graphically. Figure 1 helps assess the sensitivity—the size of the decrease in satisfaction scores associated with an increase in the waiting time—of satisfaction scores to waiting times for all questions jointly: we found that satisfaction scores are more sensitive to exam room waiting times than they are to waiting room wait times.

Figure 2 shows the relationship between the patient's age and the recorded satisfaction score. The satisfaction scores for pediatric patients tended to be higher than the scores of adolescents and young adults, though satisfaction decreased from age 10 until 20 years, and was relatively flat through the mid-30s. After approximately age 37 years, the satisfaction scores increased noticeably with age.

Satisfaction scores do not exhibit a notable relationship with gender, as we found a combined average score of 4.608 and 4.614 for women and men, respectively. However, the respondents receiving care for the first time at a particular provider (4.534 average combined score) are less satisfied than their counterparts who have previously received care there (4.637 average combined score).

Chi-Square Tests of Association

In our association tests, we found strong evidence against the null hypotheses of no association—strongly indicating a relationship or association between the satisfaction scores and both the individual and combined waiting times, as well as the first visit, and age "explanatory" variables. The self-filling indicator variable was found to have a significant association with performance scores for all but 4 questions.

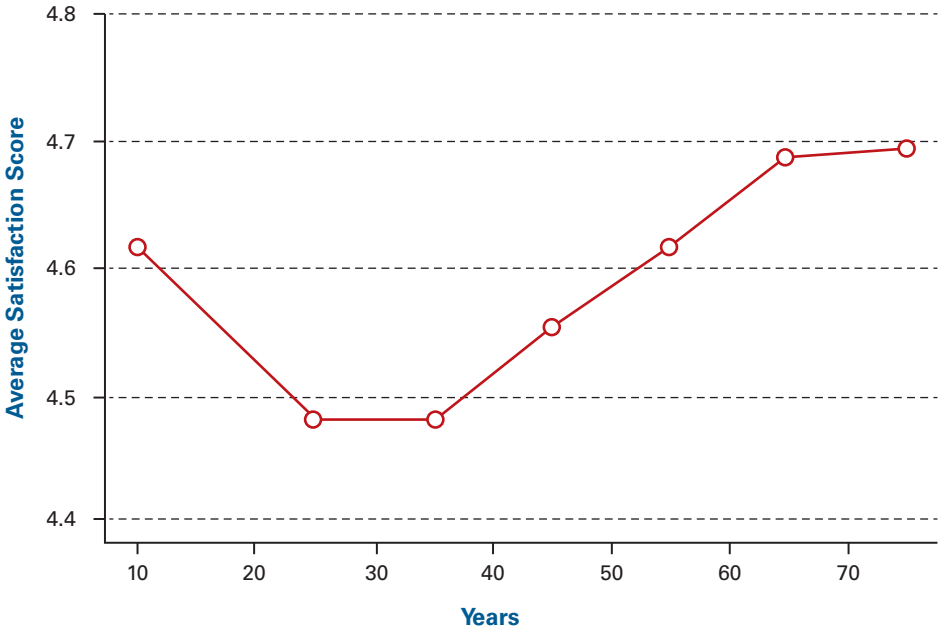
While the χ^2 tests were useful for assessing which of the studied explanatory factors were associated with performance scores, they were not designed to produce directional results (positive or negative association) or quantitative results (eg, the reduction in satisfaction scores for each additional minute the respondent waited).

Univariate Logistic Regressions

For each question and explanatory variable combination, we fitted a logistic regression model to predict the logit of the *probability that the respondent gave a score of 5* (p_5) for a particular explanatory variable. Table 3 interprets model coefficients from our univariate logistic regression study for all explanatory variables but gender.

In summary, Table 3 shows that:

Figure 2. The Relationship Between Age and Average Satisfaction Scores Across All 13 Study Questions



- Waiting 10 minutes in the waiting room decreased p_5 less than waiting 10 minutes in the exam room.
- The effects of age were positive and significant for almost all questions. More specifically, older patients tended to assess the care received more favorably with the increase between 0.5 and 2.9 percent for each additional 10 years in age.
- Patients visiting a care provider the first time were less likely to evaluate the care received with the highest score. In general, a care provider had about a 5% lower probability of receiving a score of 5 from a new patient than from a returning patient. Interestingly, first-time patients differed substantially from their peers who were not first-time patients in their assessment for questions cp9 (confidence in care provider) and cp10 (likelihood of recommending the care provider).

When survey respondents were patients themselves (ie, they were self-filling the questionnaire), they tended to evaluate the care received more favorably compared with respondents who were not the individuals receiving the care.

Multivariate Logistic Regressions

We have fitted multivariate logistic regression models in which the probability of receiving the highest satisfaction score (p_5) was predicted by a number of explanatory factors for each of the studied questions. The following variables were used and general results obtained for the models:

- Combined waiting time was considered instead of exam and waiting room times separately, so that a single model could be fitted for each question. The combined waiting time variable had a statistically significant negative effect on p_5.
- To account for the differences in the effects on satisfaction by exam and waiting room time, we included a "percent in waiting room" variable, which was calculated as a proportion of time spent in the waiting room. Consistent with our findings in the univariate models, the variable had a significant positive effect on satisfaction, implying that patients preferred to wait in the waiting room.
- First visit had a negative effect on p_5 for the majority of questions.
- Age and self-filling indicator were considered jointly, as their interaction factor was statistically significant. This is mostly due to the fact that pediatric patient surveys were filled out by the parents or guardians and the satisfaction scores supplied by them were much higher than those received from patients in their 20s and 30s.

We performed a multivariate regression model to interpret the waiting time effects on satisfaction scores for the same hypothetical person for likelihood of recommending practice. Waiting a combined time of 10 minutes results in about a 77% chance of receiving the highest satisfaction score. As the time of waiting is increased, the chance of obtaining the highest score decreased with the combined waiting times of 20 minutes, 40 minutes, and 60 minutes resulting

Table 3. Results of the Univariate Logistic Regression Models for the Binary Response Variable of Receiving a Score of 5

ID	Question Text	p5 after Waiting 10 Minutes in Waiting Room	p5 after Waiting 10 Minutes in Exam Room	p5 after Waiting 10 Minutes (combined time)	Age (increase in p5 for every 10 years)	Increase in p5 if Not First Visit	Increase in p5 if Self-Filling
cp1	Friendliness/courtesy of the care provider	0.802	0.773	0.863	0.011	0.060	0.034
cp2	Explanations the care provider gave you about your problem or condition	0.763	0.735	0.826	0.011	0.058	0.029
cp3	Concern your care provider showed for your questions or worries	0.764	0.735	0.829	0.009	0.055	0.032
cp4	Care provider's efforts to include you in decisions about your treatment	0.716	0.687	0.784	0.006	0.056	0.028
cp5	Information your care provider gave you about medications (if any)	0.704	0.677	0.770	0.007	0.072	
cp6	Instructions your care provider gave you about follow-up care (if any)	0.701	0.672	0.771	0.005	0.063	0.010
cp7	Degree to which care provider talked with you using words you could understand	0.760	0.731	0.825	0.005	0.062	0.033
cp8	Amount of time the care provider spent with you	0.666	0.631	0.748		0.030	
cp9	Your confidence in the care provider	0.766	0.737	0.828	0.012	0.071	0.034
cp10	Likelihood of recommending your care provider to others	0.775	0.746	0.839	0.013	0.067	0.034
n1	Friendliness/courtesy of the nurse/assistant	0.684	0.651	0.759	0.029	0.045	0.038
o3	Care received during your visit	0.690	0.649	0.784	0.026	0.035	0.030
o4	Likelihood of recommending practice	0.724	0.690	0.804	0.026	0.048	0.038

"p5" denotes the probability of receiving a score of 5—only the effects of those variables with coefficients that are significant at the .05 significance level are reported, with the insignificant relationships grayed out and left blank.

in a decrease in the likelihood of recommending the practice to 69%, 59%, and 53% respectively.

DISCUSSION

Our study further confirms the strong relationship between patient wait times and patient satisfaction, yet the results go beyond this well-understood notion to provide actionable findings for clinicians and healthcare managers. Our results, while supportive of our hypothesis, were especially interesting with regard to the impact of wait times on perceived quality of care received from the clinician as opposed to simply "satisfaction" with the experience. Analyzing the relationship between wait times and patient evaluation of care provided—including "confidence in the care provider"—revealed significant declines in scores across all measures tested (Table 3). Thus, we are led to believe that wait times are not just a component of patient satisfaction, but an important component of quality care. In a new healthcare economy, minimizing wait times must be taken seriously in order to compete, manage costs, and retain clientele.

While the studies conducted by other researchers[7-9] focused on total waiting times, we add to this body of literature: we evaluated the sensitivity of waiting times with respect to time spent in the waiting room, time spent in the exam room, and combined waiting time as separate data sets. Common to all studies is the negative impact that longer waiting times have on patient satisfaction; however our study also demonstrated that satisfaction scores are more sensitive to exam room waiting time than to time spent in the designated waiting room. Reasons for dissatisfaction with the exam room wait have not been examined fully, but we can surmise several explanations, including lack of material to engage the patient, an expectation of quicker service, and less comfortable surroundings. Our results demonstrate that in the realistic event that clinics fall behind schedule, it is better to allow patients to wait outside in the waiting room rather than to quickly place them in an exam room.

Our study also revealed a significant difference between new and returning patients, as the former gave significantly lower scores across all metrics. But, correspondingly, Leddy et al found that first-time patients waited significantly longer than follow-up patients.[9] Our results support this finding, as first-visit patients waited an average of 23.1 minutes versus an average of 19.6 minutes for repeat patients. Furthermore, we found that a patient's age also impacted satisfaction scores, as elderly patients gave higher physician scores than nonelderly patients,[11] and the spread in satisfaction scores between elderly and nonelderly patients actually increased as wait times increase.

Numerous case studies have shown methods to increase patient flow, reduce wait times, and augment satisfaction scores.[10,12,13] Appointment schedule, physician tardiness, and patient complexity can all heavily impact wait times,[14] but solutions do exist to improve patient throughput.

Patient waiting times alone significantly impact all measured aspects of ambulatory patient experiences, including quality of care, as compiled in the Press Ganey survey responses. We know that exam room waiting times have a more pronounced negative effect on satisfaction scores than does time spent in the waiting room, and we know that first-time patients are particularly sensitive to longer wait times. Most importantly, however, we have shown that longer wait times can actually diminish patients' perception of a physician's capabilities, and decrease the stated confidence in care provided.

Our study does have some limitations that could be addressed with further research. We cannot differentiate between the effects of the explanatory factors and the actual quality of care, and we are unable to address the impact of actual time spent with the physician. As mentioned above, 14% of responses came from repeat patient visits: additional granularity on the reasons behind repeat visits, and, whether a correlation between the frequency of visits, severity of illness, and high satisfaction exists, was not available. While these factors somewhat limit the study, the Press Ganey surveys are currently used for evaluation of satisfaction both within the inpatient and outpatient settings and can give directional guidance about the performance of individual clinics.

While it has always been a goal of healthcare systems to provide quality care as efficiently as possible, this study further emphasizes the need to minimize wait times in order to retain first-time patients, increase referrals, maintain costs, and compete in an expanding, consumer-driven marketplace. As understanding of instructions or treatment directions, perceived quality of care, and confidence in the provider decrease, it could follow that the number of complaints, unnecessary tests, and even threats of malpractice suits could increase, and we encourage study of potential relationships between these cost drivers and patient satisfaction scores. Furthermore, with the growing number of "retail" healthcare providers, and the changing relationship between patient and provider, quality of care, specifically, will become an ever-increasing factor in the competition for clients.[1] This study can provide intelligence to healthcare providers on how to prioritize a patient's time, and the need to raise patient perceptions and win in a new marketplace.

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REFERENCES

1. PricewaterhouseCooper's Health Research Institute. Healthcast 2010. PriceWaterhouseCoopers website. www.pwc.com/hri. Accessed August 18, 2010.

2. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century.* Washington, DC: National Academies Press; 2001.

3. Centers for Medicare & Medicaid Services. CAHPS Hospital Survey. http://www.hcahpsonline.org. Accessed August 15, 2010.

4. Press Ganey Associates, Inc. http://www.pressganey.com. Accessed August 15, 2010.

5. Trout A, Magnusson AR, Hedges JR. Patient satisfaction investigations and the emergency department: what does the literature say? *Acad Emerg Med.* 2000;7(6):695-709.

6. Howard M, Agarwal G, Hilts L. Patient satisfaction with access in two interprofessional academic family medicine clinics. *Fam Pract.* 2009;26(5):407-412.

7. Dansky KH, Miles J. Patient satisfaction with ambulatory healthcare services: waiting time and filling time. *Hosp Health Serv Adm.* 1997;42(2):165-177.

8. Camacho F, Anderson R, Safrit A, Jones AS, Hoffmann P. The relationship between patient's perceived waiting time and office-based practice satisfaction. *M C Med J.* 2006;67(6):409-413.

9. Leddy KM, Kaldenberg DO, Becker BW. Timeliness in ambulatory care treatment: an examination of patient satisfaction and wait times in medical practices and outpatient test and treatment facilities. *J Ambul Care Manage.* 2003;26(2):138-149.

10. Preyde M, Crawford K, Mullins L. Patients' satisfaction and wait times at Guelph General Hospital Emergency Department before and after implementation of a process improvement project. *CJEM.* 2012;14(3):157-168.

11. Kong MC, Camacho FT, Feldman SR, Anderson RT, Balkrishnan R. Correlates of patient satisfaction with physician visit: differences between elderly and nonelderly survey respondents. *Health Qual Life Outcomes.* 2007;24(5):62.

12. Chand S, Moskowitz H, Norris JB, Shade S, and Willis DR. Improving patient flow at an outpatient clinic: study of sources of variability and improvement factors. *Health Care Manag Sci.* 2009;12(3):325-340.

13. Shortening waiting times: six principles for improved access. Institute for Healthcare Improvement website. http://www.ihi.org/resources/Pages/ImprovementStories/ShorteningWaitingTimesSixPrinciplesforImprovedAccess.aspx. Updated July 22, 2011.

14. Groome LJ, Mayeaux EJ Jr. Decreasing extremes in patient waiting time. *Qual Manag Health Care.* 2010;19(2):117-128. ■

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