

The Ecology of the Patient Visit

Physical Attractiveness, Waiting Times, and Perceived Quality of Care

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Abstract: This study examined the relationship between the attractiveness of the physical environment of healthcare facilities and patient perceptions of quality, service, and waiting time through systematic observations and patient satisfaction surveys at 7 outpatient practices at Weill Cornell Medical Center. Findings indicate positive correlations between more attractive environments and higher levels of perceived quality, satisfaction, staff interaction, and reduction of patient anxiety. The comparison of actual observed time and patients' perception of time showed that patients tend to overestimate shorter waiting times and underestimate longer waiting times in both the waiting area and the examination room. Further examinations of the way outpatient-practice environments impact patient and staff perceptions and how those perceptions impact behavior and medical outcomes are suggested. **Key words:** *ambulatory, design, facilities, quality, patient perceptions, waiting times*

NEW CHALLENGES ranging from advancing technology to increasing costs are changing the face of healthcare and forcing healthcare organizations to shift their focus and change the way they operate. One major change has been in the ratio of inpatient to outpatient visits. Since the 1950s, the yearly total of outpatient procedures has risen. In 1975, there were 190 million outpatient visits. In 1995, there were 425 million, and in 2004, 575 million (American Hospital Association, 2006; Pressler, 1993). As more ambulatory facilities are constructed to meet the increasing demand of outpatient procedures, healthcare organizations have begun to realize the importance of attracting people to their facility.

Many of these people are older. The shifting demographics of the patient population are having, and will continue to have, a major impact on the way that healthcare is delivered as well as consumed. Currently, 27% of

Americans (approximately 80 million people) are older than 50. In 20 years, approximately 35% of the US population will be older than 50 (Department of Health & Human Services, 2006; Pressler, 1993). The baby boom generation utilizes healthcare in different ways than previous generations. This "prosumer society" (Carpman et al., 1986) has higher service expectations in all areas of their lives, including healthcare. As a result of these developments, healthcare organizations are finding themselves under more competitive pressure from emerging "specialty" practices that have surfaced as a result of increased patient demand (Iglehart, 2005). Hospitals and healthcare practices that previously controlled their localized market share are now facing competition from new hospitals and practices, thus forcing them to reevaluate their own practice to retain a competitive advantage (Cuellar & Gertler, 2005).

PATIENT-CENTERED CARE

Over the last 20 years, a major focus of the rethinking of healthcare systems has been on "patient-centered care" (Carpman et al., 1986; Malkin, 1992; Marberry, 2006), that is,

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shifting the focus of healthcare to the needs of the patient, including using design to create more patient-friendly facilities. In 2001, the Institute of Medicine included patient-centered care as 1 of 6 specific aims for improvements that are needed for healthcare to bridge the quality chasm that exists in today's healthcare system, along with safety, effectiveness, timeliness, efficiency, and equity (Institute of Medicine, 2001).

The physical environment of healthcare facilities

In response to changes in medical practice and consumer expectations, in 2004 the United States spent more than \$16 billion for hospital construction (Babwin, 2002; Ulrich et al., 2004). In 2006, healthcare construction projects worth more than \$39 billion broke ground; the total projected costs of healthcare facilities in the design phase in 2006 was almost \$75 billion (Romano, 2006). A significant proportion of this construction is for ambulatory facilities. This marks a major shift in focus from acute inpatient hospital care to an increasing range of outpatient services (Nesmith, 1995). With the shift to increased outpatient and ambulatory practices, the types of patient-outcome measures affected by the facility design have also shifted.

Measures such as the average length of stay (in *days*), which make sense when the focus is on inpatient care, make little sense in the context of outpatient services. In ambulatory facilities, time measured in minutes and hours becomes more relevant; so, too, does the consideration of the patient's perceptions of quality and satisfaction. Stern et al., (2003) argue that as healthcare organizations strive to satisfy their customers in a competitive marketplace more attention is paid to how patients perceive their physical surroundings and how that experience affects their view of the healthcare they receive.

Quality of care and the physical environment

Arneil and Devlin (2002) found that the design of outpatient waiting-room environments influenced patients' perceived quality

of care. More attractive waiting areas were associated with higher perceived quality of care. While this is one of the few studies to have looked at the design of waiting rooms on patients' perceptions of care, the subjects were not actually patients or physically in the environments themselves. Instead, subjects used photographic images of the waiting-room environment to make their judgments. The study reported here seeks to test whether the relationship between physical attractiveness of ambulatory-waiting environments and perceived quality of care holds up when actual patients rate their quality of care in the ambulatory waiting areas where they are being treated.

Staff-patient interaction

While Arneil and Devlin found a relationship between physical attractiveness and perceived quality of care, Powers and Bendall-Lyon (2003) showed that patients' evaluation of their overall healthcare experience included interpersonal relations and interactions with staff, including their responsiveness, courtesy, competence, and communication. The performance and attitude of healthcare staff can, in turn, be influenced by the physical environment in which they work (Bitner, 1992; Davis, 1984). Becker and Poe (1980) found positive effects on the mood and morale of medical staff after several small design modifications, such as repainting hallways, adding wall murals, and rearranging furniture, were made to their workspaces. A 1956 study by Maslow and Mintz found that subjects perceived people more positively in beautiful rooms than in ugly rooms (Maslow & Mintz, 1956). As Arneil and Devlin note, "many aspects of the perceived quality of care that seem to be observable by the patient are not only positive interactions between the staff and patient, but between the patient and environment as well" (Arneil & Devlin, 2002, p. 346).

Waiting times

A key factor that consistently emerges in patient satisfaction studies is waiting times, both

in the registration process and to see a physician (Press Ganey Associates, 2005). Using patient self-reported or staff-recorded waiting times, Miceli and Wolosin (2004) found that longer waiting times were negatively correlated with overall satisfaction. However, Miceli and Wolosin found that good communication and a strong relationship between patient and caregiver reduced these negative effects.

The most frustrating element of waiting can be that there is generally no control over how long the wait will be for a particular service. When in the overall visit waiting occurs also affects patient satisfaction with the overall visit. Waiting in a surgical unit has been categorized into 3 separate phases: preprocess; in-process; and postprocess (Dube-Rioux et al., 1989). In the context of an ambulatory waiting room, *preprocess* is from the time of arrival to when the patient is taken back into the examination area. *Inprocess* is the time between entering and leaving the examination area. *Postprocess* is the remaining time it takes after leaving the examination area for the patient to complete all necessary paperwork and exit the facility.

Studies have shown that perceived and actual waiting times also differ. In an extensive study of the influence of waiting on the perception of service quality in nuclear medicine, De Man et al. (2005) found that perceived total waiting time was significantly lower than the objective waiting time, the perceived pre-process waiting time was significantly lower than the actual waiting time, and the perceived waiting time inprocess was higher than the actual time. Providing information about the reasons for delay significantly reduced the difference between the perceived time and actual time.

Additional research has examined the relationship between the perceived waiting time and actual waiting time, how patients spend their time waiting, and service satisfaction. In a study of an urgent care department, Dansky and Miles (1997) found that total time spent waiting for the clinician was the most significant predictor of patient satisfaction. Informing patients how long their wait would

be and being occupied during the wait were also significant predictors of patient satisfaction. On average, patients spent 55 minutes in the waiting area before entering the treatment room, 17 minutes in the treatment room before a clinician entered, and 107 minutes overall in the facility (Dansky & Miles, 1997). The longest waiting time was the total time spent waiting to see the clinician. This time significantly predicted satisfaction with clinicians, the urgent care department, and overall satisfaction.

ENVIRONMENTAL DISTRACTIONS

Few people look forward to waiting. Depending on the nature and circumstances of the wait, the 3 phases of waiting (preprocess, inprocess, and postprocess) can result in 2 basic psychological and physiological responses: uncertainty, including annoyance, irritability, and stress; and anger (Taylor, 1994). To reduce these responses, health facilities typically provide some form of distraction, most often television and/or magazines, in the waiting space. Less often, distractions include things such as indoor and outdoor views, patient-education resources, and refreshments. Such distractions, as well as giving people a choice of what they can do when they wait, have been shown to help reduce stress and anxiety (Hosking & Haggard, 1999).

Despite the fact that waiting is a fundamental fact of hospital visits, and that both the length and experience of waiting can influence patients' and visitors' perceived quality of care, little research has examined how the physical attractiveness of the settings in which waiting occurs influences perceived waiting times. The research carried out so far has involved nonpatients and photographs (Arneil & Devlin, 2002) rather than actual patients in the healthcare setting, and virtually all of the research on patient-centered care to date has focused on inpatient rather than outpatient facilities and services, although outpatient visits have increased enormously over the past 2 decades. This study examined the relationships between the attractiveness of the physical setting and actual and perceived

waiting times, quality of care, anxiety, and staff-patient interaction for patients in an outpatient facility.

METHODS

Research design and site selection

The target research sites were 6 clinical outpatient practices located in 6 facilities within the Weill Cornell Medical Center/New York-Presbyterian Hospital in New York City. The facilities varied significantly in physical attractiveness overall, as well as within each of the 3 types of medical practices examined: gynecology, dermatology, and gastroenterology. The 3 less physically attractive practices were selected because of existing plans to move those practices into a new ambulatory care building currently under construction by Weill Cornell. This created the potential for future research comparing patient and staff experience between the new and existing facilities. Separate locations within the same healthcare system were chosen in an attempt to hold the differences in staff quality, patient populations, and organizational culture constant as much as possible in any large, complex medical system.

Site descriptions

All practices are part of the Weill Cornell Medical College, New York Presbyterian Hospital system. Three of the practices, the Jay Monahan Center for Gastrointestinal Health and 2 practices within the Iris Cantor Women's Health Center, were located in independent facilities within a few blocks of the main hospital complex, where the remaining 3 practices were located.

Jay Monahan Center for Gastrointestinal Health

The Jay Monahan Center for Gastrointestinal Health opened in 2004 and was the newest of the practices studied. Its design was intended to create a "spa aesthetic." The practice contains colorful contemporary furnishings and artwork and uses many sustainable finishes and materials.

Iris Cantor Women's Health Center

The Iris Cantor Center for Women's Health opened in 2002. The 10th-floor gastroenterology and dermatology practices and the 11th-floor gynecology practice had similar physical environments, which included pastel colors, artwork by contemporary female artists, and modern furniture.

The remaining 3 practices included in the study were located in the Weill Cornell Medical College, New York Presbyterian Hospital complex, built in 1932.

J130 gynecology practice

This practice's decor was characterized by dark woods, classical furniture, and residential-style ambient lighting.

Gastroenterology practice

This practice's decor was characterized by neutral-colored walls, brightly colored synthetic furnishings, and bright lighting.

Dermatology practice

This practice's design was characterized by neutral cream-colored walls, furnishings with synthetic materials, and minimal decoration.

Physical environment ranking

Rankings of the physical attractiveness of the 6 facilities were completed by 6 Cornell University graduate students in non-design-related majors. The panel compared all of the practices on the basis of multiple photographic images with no knowledge of the type of practice, staff, or hospital affiliation. Each student was shown 4 photos of each of the 6 locations. Photos showed the waiting room, examination room, and hallway of each practice. Panel members were asked to rank the environments from most attractive to least attractive. The results of their rankings were then assigned a number value of 1 through 6, with 6 being the most attractive environment and 1 being the least attractive. Results of all the subjects were then combined to create an environmental attractiveness score for each location. The theoretical maximum and minimum were 36 and 6, respectively, with the higher number reflecting a more attractive

environment. Actual rankings ranged from 34 to 9, with a high level of interrater reliability (Kendall's $W = 0.676$).

Data collection

Multimethod data collection included systematic observations and patient surveys. Observations occurred over a 13-week period. Over the duration of the study, 787 patients were observed across all practices in more than 370 hours of data collection. Of the total of 787 patients observed across all 7 practices, 70% were between the ages of 25 and 50 years, 80% were women, and 77% came alone. During the same period, 205 patient surveys were collected from the 7 practices.

Systematic observation procedure

The amount of time spent waiting and the range of activities patients engaged in while waiting were recorded Monday through Friday, observing both morning and afternoon sessions. Observations were conducted by 2 research assistants at a time, both of whom had synchronized watches and data collection sheets. One observer was located in the practice waiting area to observe the time at which patients entered the practice, the registration process, the activities engaged in while waiting, and the time until called back into the examination room by a staff member. This observer also noted demographic information including the patient's age, gender, and whether the patient had someone accompanying him or her on the visit. Intercoder reliability for these demographic variables was more than 90%.

The second research assistant was located in the examination-room hallway, where she was able to see the doorways of all examination rooms. She observed patients from the time they were brought in from the waiting area by a staff member till they left the examination room. The times at which the patient entered the examination room, a nurse or medical assistant entered and left the examination room, the doctor entered and left the examination room, and finally the patient left the examination room were recorded. Ob-

servers had no verbal or physical interaction with the patients.

All observations were recorded in time format (ie, 2:30 PM) on data collection sheets. The sheets of the 2 research assistants were then collected at the end of each observation session. Using the patient physical descriptions (eg, gender, age, etc) as identifiers, it was possible to link the observations of both observers to calculate time data for the entire patient visit.

Patient survey procedure

Every patient, on completing his or her visit to the clinic, was asked by a designated practice staff member whether he or she would be willing to fill out a survey for a study of patient satisfaction. Participation was voluntary and survey responses were anonymous. Questions were about the waiting area and examination room, interaction with staff, and overall perceptions of quality of care. Patients were given the choice of filling out the survey before they left the clinic or taking the survey home and then mailing it back to the Cornell researchers directly in a self-addressed and stamped envelope supplied to them. If they completed the survey before leaving the clinic, they folded the survey and put it in a sealed envelope and dropped it into a special survey drop box placed on the counter in the reception area. These surveys were collected weekly by the Cornell researchers.

Over the 15-week duration of the study, 205 surveys were collected from the 7 practices. Although staff were instructed to ask all patients to fill out a survey on the completion of their visit, on the basis of observations and talking with staff only about 50% of the patients were actually offered surveys. This figure and the average number of patients scheduled per day were used to calculate the approximate response rates for each location. While the response rates were low (8%-20%), a comparison of the observed patient population demographics with the demographics from the patient surveys indicated that the survey population was representative of the patient population visiting the practice over the course of the study.

Table 1. Averaged time findings for all locations

Observed times findings	Average	Standard deviation	Average percentage of total visit
Total time in clinic	1.03	0.34	100
Time spent with doctor	0.13	0.15	21
Time spent with all staff	0.17	0.15	27
Total wait time	0.48	0.31	76
Time in waiting area	0.23	0.47	37
Time in examination room	0.34	0.27	54
Time spent alone in examination room	0.18	0.23	29
Time in examination room till doctor entered	0.15	0.15	24

Quality and staff indexes

The final 4 questions on the patient survey were combined and averaged to create a quality-of-care index that reflected patients’ overall impression of their visit. The 4 questions were as follows: (1) The care I received here today was. . .; (2) The service I received here today was. . .; (3) Overall, my interactions with staff were. . .; and (4) Overall, my interactions with doctors were. . .

Similarly, an overall staff-interaction index was calculated by averaging patient responses from the following 4 survey questions: “I was treated with kindness and respect by the staff,” “The office staff were helpful during my visit today,” “The value of my time was respected by the office staff,” and “The office staff were friendly during my visit today.”

Data for both indices were analyzed in terms of the percentage of respondents who replied to survey questions with an “Excellent” response because research has shown that there is a significant difference in perception between respondents who respond with the highest possible rating and those who do not. Responses in the “top box” characterize patients who become intensely loyal customers, leading to greater market share and achievement of financial objectives (Marberry, 2006; Press Ganey Associates, 2006).

Actual versus perceived time

In addition to the times recorded by the research assistant in each location, patients’ per-

ception of how long they waited in the waiting area and in the examination room was assessed on the survey.

FINDINGS

Attractiveness of the physical environment

Independent rankings of the attractiveness of the physical environment ranged from 34 (*most attractive*) to 9 (*least attractive*). Patients in each practice were also asked questions about their perception of the pleasantness of the physical environment on their satisfaction surveys. The correlations were significant between the independent panel environmental ranking and “The waiting area was pleasant” ($r = 0.617, P < .01$) and “The examination room was pleasant” ($r = 0.528, P < .01$). There was also a positive correlation between those 2 patient-reported measures ($r = 0.456, P < .01$). These positive correlations indicate overall consistency between perceptions of the patients in the practices and independent observers.

Observed time findings

Table 1 shows the overall time findings for all patients observed in all locations.

The average percentage of total visit was determined by dividing that time category by 63 minutes, the average total time across all practices.

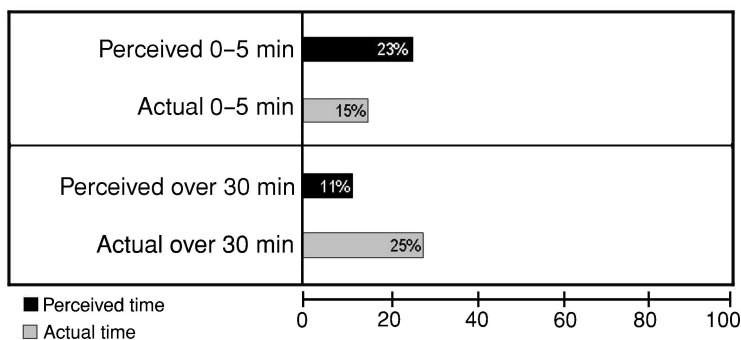


Figure 1. Actual time versus perceived time in waiting area, all locations.

Actual time versus perceived time

Results (Table 1) showed that patients spent approximately three quarters of their visit waiting, and almost a third of their visit waiting alone in the examination room. When actual and perceived times were compared, patients tended to overestimate shorter waiting times and underestimate longer waiting times. That is, more people said they waited 0 to 5 minutes, the shortest waiting time category on the survey, than were observed waiting that long; and more people were observed waiting for more than 30 minutes, the longest time category on the survey, than reported waited that long. This pattern was true for waiting times in both the waiting area and the examination room before the doctor entered (Figures 1 and 2). The same pattern held when comparing practice types, with the exception of the gastroenterology practices wait-

ing areas. Here, no relationship was found between the attractiveness of the environment and perceptions of waiting a short time. The lack of difference in the shorter time category may be due to the fact that, in comparison to the other practices, very few patients waited less than 5 minutes in either gastroenterology practice. No significant relationships were found between any of the observed time measures and patient perceptions or between actual time measures and rankings of attractiveness.

Overall, patients who responded that they waited less than 5 minutes had significantly higher perceptions of quality of care (18% higher for time in the waiting area and 26% for waiting time in examination room) and higher perceptions of the environment reducing their anxiety (23% in the waiting area and 38% in the examination room) than patients

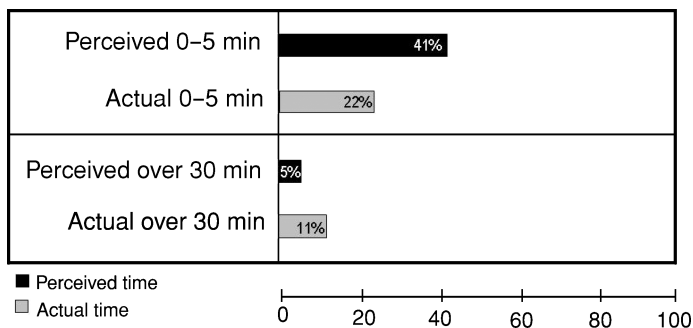


Figure 2. Actual time versus perceived time in examination room until doctor entered, all locations.

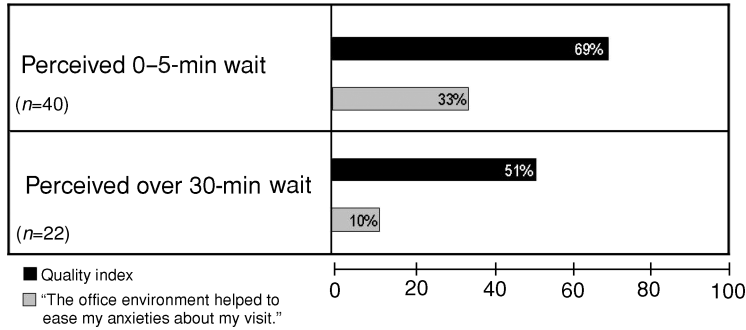


Figure 3. Perceived time in waiting area; quality-of-care index and anxiety relief, all locations.

who reported waiting more than 30 minutes in each of those locations (Figures 3 and 4).

Comparisons of patient perceptions of their length of wait in the waiting area and examination room to the quality-of-care and staff-interaction indices showed that patients' wait time in the examination room before the doctor entered more strongly correlated with their overall perceptions than their wait time in the waiting area (Table 2). The correlations are positive because of the initial coding of patient responses, in which shorter waiting times were higher numbers so that higher responses indicated a more positive experience throughout all data.

Patient perceptions of quality and anxiety

There were significant correlations between the overall patient-quality index and at-

tractiveness of the physical environment ($r = 0.335, P < .01$), and between relief of patient anxiety and the attractiveness of the environment ($r = 0.294, P < .01$).

Survey responses from the environments with the largest difference in attractiveness rankings were then compared. Patient perceptions of quality of care, anxiety, feeling cared for, and the likelihood of recommending the practice to others were, on average, twice as high in the most compared to those in the least attractive physical settings (Figure 5).

Because the amount of patient anxiety likely varies by practice type, analyses compared the levels of reported anxiety reduction related to environmental attractiveness for each practice type (Table 3). Results showed that within each of the 3 practice types examined (dermatology, gynecology, and gastroenterology), the more attractive physical

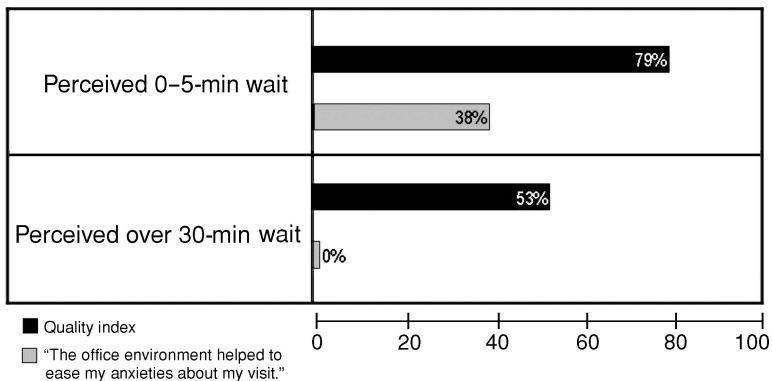


Figure 4. Perceived time in examination room until doctor entered; quality-of-care index and anxiety relief, all locations.

Table 2. Correlations of waiting time in waiting area and examination room before doctor entered with quality-of-care and staff-interaction indexes

Indexes	I had to wait too long before being called into the examination room	I had to wait too long in the examination room before being seen by the doctor
Quality-of-care index	0.199	0.345
Staff-interaction index	0.290	0.412

environment had a higher percentage of reported anxiety reduction.

The relationship between the physical environment, reduction of patient anxiety, and overall patient perception of quality was examined further using regression analysis (Table 4). Linear regression showed that the attractiveness of the physical environment was a significant predictor of the patient's perception of quality of care as well as the reduction of patient anxiety, controlling for practice type in both analyses.

Patient perceptions of staff interaction

Staff-interaction indices, by location, are shown in Figure 6, along with the ranking of attractiveness of each location. The staff-interaction index and the overall quality-of-care index were significantly correlated ($r = 0.504, P < .01$), as were the staff-interaction index and the attractiveness of the environment ($r = 0.352, P < .01$). There was no relationship between the patient-to-staff ratio of a practice and the patient's perception of staff interaction. Significant correlations were found between the staff-interaction index, quality-of-care index, and the attractiveness of the environment (Tables 5 and 6).

DISCUSSION

These findings are consistent with the results of Arneil and Devlin's (2002) study, which found that perceived quality of care was greater for rooms that contained nice furnishings, artwork, and lighting, and were warm in appearance than those that did not; and with the findings of DeMan et al. and Dansky and Miles, who found significant differences between perceived and actual waiting time and significant relationships between

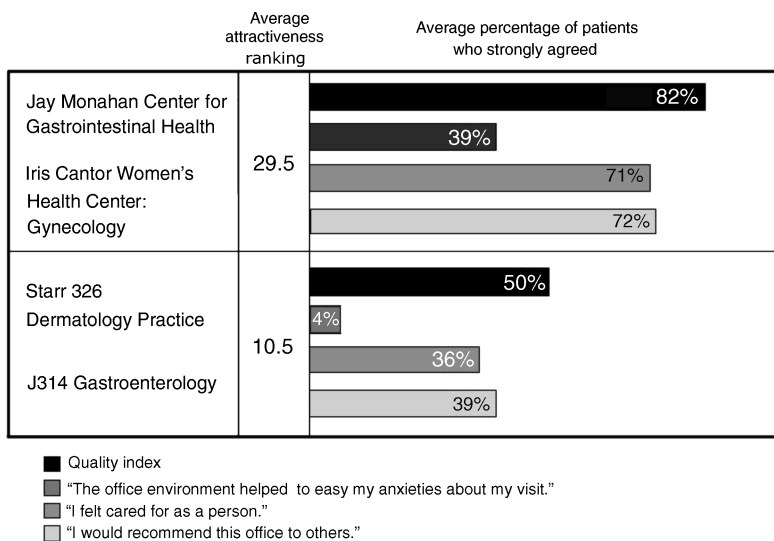


Figure 5. Patient perceptions of quality, anxiety, feeling cared for, and likelihood of recommendation; most- and least-attractive practices.

Table 3. Attractiveness of environment, anxiety relief, quality-of-care index and likelihood of recommendation by location and type of practice

	Attractiveness rating	Anxiety, %	Overall quality, %	Recommendation, %
Dermatology				
Iris Cantor, 10th-floor, Dermatology	25	22	70	55
Starr 326, Dermatology Practice	9	8	61	44
Gynecology				
Iris Cantor, Women's Health Center: Gynecology	25	24	78	63
J130 Obstetrics and Gynecology	21	14	84	64
Gastroenterology				
Jay Monahan Center for Gastrointestinal Health	34	54	86	81
Iris Cantor, 10th-floor, Gastroenterology	25	40	79	55
J314 Gastroenterology	12	0	40	34

perceived waiting times and satisfaction with the visit and quality of care (Dansky & Miles, 1997; De Man et al., 2005).

There are several possible explanations for the relationship of the attractiveness of the environment with the patient's perceived quality. As Arneil and Devlin (2002) stated, the most obvious explanation might be that when patients perceive that a physician or other staff have put effort and care into the waiting-room environment, they assume that same level of care and concern will be given to them as a patient in that facility. Research has also shown that patients tend to be overwhelmed with the technicality of their med-

ical visit, so in lieu of the things they cannot understand (such as procedures, terminology, and medical equipment), they rely more heavily on things that are familiar and cues they can interpret, such as their physical surroundings (Berry & Bendapudi, 2003).

This concept of using the physical environment as a way to communicate organizational values as well as creating a more positive experience for the patient is at the core of the patient-centered care movement advocated by organizations such as the Planetree Foundation, The Center for Health Design, and the Institute for Healthcare Improvement. The Planetree organization, for example,

Table 4. Regression of attractiveness of physical environment and quality-of-care index on reduction of patient anxiety, controlling for practice type

Predictor	R ²	ER ²	FER ²	df ₁	df ₂	Significance
Attractiveness of environment	0.13	0.04	9.02	1	186	.000
Quality-of-care index	0.48	0.15	36.14	1	181	.000
Attractiveness of environment, controlling for quality	0.49	0.01	1.29	1	180	NS

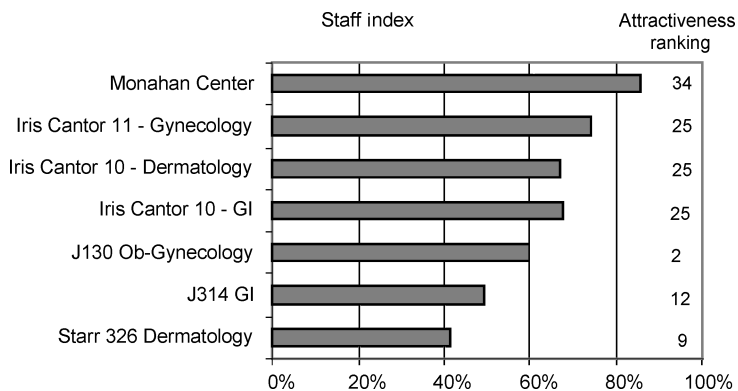


Figure 6. Staff-interaction index by location, with attractiveness ranking.

advocates the use of domestic-inspired aesthetics, art and warm home-like, noninstitutional designs that are familiar and welcoming and value patients over technology. Plane-tree design guidelines seek to achieve this experience by encouraging the use of wood and natural colors and materials (Schweitzer et al., 2004). Design recommendations such as these aim to utilize the environment as a way to inform the patient about the quality of care at that facility, as well as to reduce some of the anxiety that patients frequently associate with medical visits.

Environmental attractiveness and patient perceptions of staff interactions

The significant relationship between environmental attractiveness and patients' positive impressions of interactions with staff in-

teraction support previous findings that have found subjects to have more positive impressions of people while in more attractive environments (Maslow & Mintz, 1956). Although variation in actual staff behaviors in different environments is not discernable from this study, the strong relationship between the patient's impression of their interaction with staff and their overall impression of quality of care, supports previous research that communication and interpersonal relations with caregivers play a vital role in the patient's perceptions of their visit (Powers & Bendall-Lyon, 2003; Saultz, 2003).

Environmental attractiveness and perceived waiting times

While significant relationships were found between patient perceptions of time and

Table 5. Correlations of patient perceptions and attractiveness of the environment (all correlations significant at the $P < .01$ level)

Measure	Attractiveness ranking	Quality-of-care index	Staff index
Attractiveness ranking	1.00
Quality-of-care index	0.335	1.00	...
Staff index	0.352	0.504	1.00
The office environment helped to ease my anxieties about my visit	0.294	0.369	0.422
I would recommend this office to others	0.282	0.530	0.709
Overall, I felt cared for as a person during my visit	0.340	0.520	0.659
I was made to feel welcome during my visit	0.280	0.510	0.711

Table 6. Regression of attractiveness of physical environment and quality-of-care index on staff interaction index, controlling for practice type

Predictor	R^2	ΔR^2	$F\Delta R^2$	df_1	df_2	Significance
Attractiveness of environment	0.33	0.10	19.40	1	179	.000
Quality-of-care index	0.53	0.27	65.67	1	179	.000
Attractiveness of environment, controlling for quality	0.54	0.18	46.13	1	178	.000

outcome measures of overall quality of care and relief of anxiety, no significant relationships were found between observed time measures with either quality of care or anxiety responses. While previous studies have shown a relationship between waiting time and patient satisfaction (Dansky & Miles, 1997), the lack of a relationship between actual time and patient outcomes and the presence of a relationship between perceived time and quality of care in this study suggests that patient perceptions may play a more integral role in the formation of overall quality and satisfaction impressions than actual time spent. If perceived waiting time is more important than actual waiting time, as the findings in this study suggest, the further finding that the attractiveness of the physical environment influenced perceived waiting times highlights an important way in which the physical environment can influence patients' visit experience.

CONCLUSIONS

This study shows that the physical environment of healthcare facilities influences the patient's waiting experience and their perception of quality of care. There is no one aspect of the visit, or element of design, that conclusively defines the patient experience. Rather, it is a combination of both physical and social factors that influence both staff and patients. Given tight budgets and cost constraints in healthcare construction and renovation, it would be worthwhile to better understand what specific environmental factors and aesthetic details within the healthcare en-

vironment both staff and patients pay most attention to, and how those details impact staff behavior and patients' perceptions of their wait and overall quality of care.

Ulrich (2001) and others talk about the importance of positive distractions, but too often in waiting areas, these take the form of a television on the wall and a jumble of often-outdated magazines on a table. We found in this study that computers intended for patient use in 2 of the waiting areas studied were almost never used. Two factors seemed to account for this. On closer inspection, we discovered that the computers were in fact turned on, but the screens were set to black, with nothing showing. One row of computers was also at counter height, with bar stool-type seating. As a mini-experiment, we set the screen saver to show the desktop, and repositioned a row of desk height computers so they were visible from the reception area. In 1 hour, as many of the computers were used as in 10 weeks of observation. Health pamphlets were almost never read or taken by patients or visitors, despite being prominently located in the waiting area. Future research should explore how relatively small design features in the waiting-room environment, ranging from the provision of computers and internet access to the use of fish tanks, water features, and so on affect perceived waiting times. More attention also needs to be paid to the positioning of seating. Even in expensive and beautifully designed waiting areas, the arrangement of chairs often more resembles what might be found in a bus station than in, for example, a modern hotel lobby. Closely packed rows of chairs provide no personal

space for people sitting next to each other, and could be expected to increase stress and anxiety and perceived waiting time. Research on such details and their effects have the potential to enable healthcare organizations to make small, focused changes within their existing environments that can positively impact the perceived quality of care.

Current hospital design devotes considerable attention and resources to creating general waiting areas. Yet, we found that patients spent almost a third of their visit waiting in the examination room, typically alone and with nothing to do or occupy their attention. More attention needs to be devoted to understanding patients' journey through their entire healthcare visit. With a more thorough understanding of how space is actually used, we might pay more attention to areas such as examination rooms than to the more public and visible waiting areas that currently attract more interest and resources, but have potentially less impact on the patient experience.

Much of the focus on "patient-centered design" has been on creating more pleasant and comfortable environments for patients and their family. Our findings, which are con-

sistent with the research noted above, indicate that paying attention to and investing resources in the quality of the physical settings patients experience in obtaining healthcare are worthwhile. The significant relationship between patients' perception of their interaction with staff and patients' perception of overall quality of care underscores the importance of also understanding how the physical settings in which staff deliver care affects their attitude and behavior. "Patient-centered care" from this perspective must consider not only the patient's experience but also staff's. Given that staff inhabit the healthcare facility for significantly longer periods of time than do patients and their family and friends, and utilize it in different ways than the patients, better understanding the relationship between staff and their environment is critical. Future research should examine whether patients' more positive perceptions of staff in more physically attractive environments are related to the halo effect of the environment, much as Maslow and Mintz (1956) found 50 years ago, or are related to staff-behavior patterns with patients that are actually more positive in more physically attractive settings.

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