Reducing Wait Times in a Hospital Pharmacy to Promote Customer Service

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REDUCING WAIT TIMES IN A HOSPITAL PHARMACY TO PROMOTE CUSTOMER SERVICE

by

Julie M. Slowiak

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
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Julie M. Slowiak
The quality of service received by a customer affects their satisfaction with the organization. To increase the probability that customers will return to an organization, it is critical that customers are satisfied with the organization’s services. The amount of time customers spend waiting in line can affect their satisfaction with an organization’s services (Gail & Lucey, 1997). This study examined the effects of a single intervention versus a combined intervention package to reduce wait times in a hospital’s outpatient pharmacy. Customer satisfaction ratings were collected to determine the effect of a reduction in wait time on customer service satisfaction with wait time. An ABCB within-subjects design was used to assess both wait time and customers’ levels of satisfaction with their wait time, where A = Baseline (no feedback and no goal setting), B = Customer Satisfaction Feedback, and C = Customer Satisfaction Feedback, Wait Time Feedback, and Goal Setting for Wait Time Reduction. Results show small to moderate reductions in wait time during intervention phases. Reduction in wait time had little effect on customers’ levels of satisfaction with wait time. Limitations and suggestions for future research are discussed, focusing on highly-variable environments.
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Introduction

Customer service is an essential element in any organization; it has become a top priority within the health care industry (DiBenedetto, Lewis, & Conroy, 1999). While many people do not consider customer service when they think about a medical facility, quality of customer service has become just as important as quality of patient care. Competition among a vast array of health care providers has been a key factor in increasing the importance of customer service (Eisenberg, 1997). Medical facilities recognize that customers, both internal (e.g., employees and physicians) and external (e.g., patients, their families, organizational purchasers), are able to choose among competing providers (Dwore, 1993).

The quality of service received by customers affects their satisfaction with the organization. To increase the probability that customers will return to an organization, it is critical that customers are satisfied with the organization’s services. This, in turn, decreases the possibility that those customers will seek similar services elsewhere (Rosselli, Moss, & Luecke, 1989). Retaining existing customers has the potential to save hospitals time and money by reducing costs associated with advertising, personnel, setting up new patient accounts and explaining hospital procedures and treatment guidelines. Furthermore, the costs associated with attracting new customers are about five times greater than maintaining current ones (Mittal & Lassar, 1998; Spechler, 1989; Uller, 1989). Thus, customer service can affect an organization’s bottom line.

The amount of time customers spend waiting in line can affect their satisfaction with an organization’s services (Gail & Lucey, 1997). “When waiting lines form, a small increase in service times for each customer magnifies into a significant increase in
waiting time for the customer at the end of the line” (Evangelist, Godwin, Johnson, Conzola, Kizer, Young-Helu, & Metters, 2002, p. 91). For the customer at the end of the line, the long waiting time negatively affects his or her satisfaction and decreases the likelihood that he or she will return to the organization in the future. Furthermore, Maggard (1981) proposed that customer dissatisfaction can result in a loss of long-term profits due to decreased customer retention, fewer repeat visits, and conveyance of dissatisfaction with the organization to others. Therefore, the importance of reducing wait times is evident and should be considered when superior customer service is a major goal of an organization.

Customer service has been targeted for performance improvement through the use of some combination of feedback, goal setting, performance contingent rewards, and task clarification (Austin, Olson, & Wellsley, 2001; Brown & Sulzer-Azaroff, 1994; Crowell, Anderson, Abel, & Sergio, 1988; Eikenhout & Austin, 2005; Lafleur & Hyten, 1995; Slowiak, Madden, & Mathews, 2005; Wilson, Boni, & Hogg, 1997). Each of these procedures has been widely used in performance improvement interventions and has been found to be successful in behavior change. Reviews of the effectiveness of performance feedback (e.g., Alvero, Bucklin, & Austin, 2001; Balcazar, Hopkins, & Suarez, 1985/1986) support three conclusions: (a) feedback does not consistently improve performance, (b) the combination of feedback with other procedures tends to result in more reliable effects than when feedback is used alone, and (c) more information regarding the function of feedback is needed. Applications and reviews of the effectiveness of goal setting (e.g., Fellner & Sulzer-Azaroff, 1984; Wilk & Redmon, 1990) are also prominent in the literature.
Wilson et al. (1997) implemented a task clarification workshop for police officers to increase knowledge of courteous behaviors (e.g., promptness, voice tone, smiling, greeting, etc.) and found increases in these behaviors ranging from 7% to 28%. Wilson and colleagues further evaluated the effects of praise and corrective feedback in addition to task clarification. Praise and feedback provided by supervisors failed to produce major improvement in performance; however, courteous behaviors increased by approximately 13% when praise and corrective feedback were delivered by individuals unaffiliated with the organization. The researchers suggested this may have been due to the fact that the outside observers were free of other work demands and were able to provide regular, immediate, and specific feedback.

In a related study of 26 hotel banquet employees, LaFleur and Hyten (1995) implemented a multi-component intervention package including task clarification (training, job aids, and checklists), graphic feedback, goal setting, and performance contingent monetary rewards to improve the accuracy and timeliness of hotel function setups. The quality of staff performance was defined as accuracy plus timeliness of setups; it increased from about 70% to almost 100% when the treatment package was in place. High customer satisfaction ratings prior to the intervention left little room for improvement; however, high ratings were maintained and may have slightly increased during the intervention.

The banking industry has also benefited from applications of organizational behavior management (OBM). Crowell et al. (1988) used task clarification, feedback, and social praise to improve customer service provided by bank tellers. Eleven categories of verbal behavior were used to define customer service (e.g., time to service, greeting,
using the customer's name, voice tone, closing, etc.). The three intervention components were implemented individually. Following the introduction of task clarification, the overall quality of customer service improved by 12% over baseline. The feedback component consisted of a publicly posted chart for each bank teller along with verbal feedback given by the manager. Once implemented, feedback produced an additional 6% increase in customer service. Finally, the third intervention procedure, social praise, produced another 7% increase in the overall quality of customer service.

Similarly, Brown & Sulzer-Azaroff (1994) examined the relationship between customer satisfaction and bank teller service friendliness. To assess this relationship, Brown and Sulzer-Azaroff developed a customer satisfaction data collection system in which customers placed a poker chip into one of five labeled slots (e.g., extremely satisfied, somewhat satisfied) in a survey box to indicate how satisfied they were with the service they had received from the bank teller. Service friendliness data were collected by recording the bank tellers' rates of greeting, smiling, and looking at their customers during the first three seconds of the interaction. The researchers also evaluated the effect of feedback on the three target behaviors. Results illustrated that the implementation of feedback increased rates of greeting, smiling and looking. In addition, 520 of the 525 pokers chips that were dispersed to customers were returned. This high response rate (99%) from customers demonstrated the effectiveness of the researchers' data collection system. Furthermore, results indicated a correlation of .50 (p < .05) between customer satisfaction and the presence of greetings initiated by the bank tellers.

Austin et al. (2001) implemented a treatment package consisting of self-monitoring, task clarification and public posting to improve the performance of customer
service representatives at an insurance agency. Austin and colleagues targeted two customer service behaviors: (1) the percent of transactions during which the customer’s name was used, and (2) the percent of transactions during which tellers suggested additional services available to customers. The intervention produced an average of 51% improvement over baseline in the use of customer names and an average of 56% improvement over baseline in suggesting additional services.

Feedback, goal setting, and reinforcement were used to improve five customer service behaviors of 115 employees of a large department store (Eikenhout & Austin, 2005). Eikenhout and Austin used the Performance Diagnostic Checklist to determine components to be included in their intervention. The effects of feedback versus a package intervention (feedback, goal setting, and reinforcement) were assessed using an ABAC multiple baseline design across three employee groups. All five customer service behaviors increased in frequency during both intervention phases in comparison to baseline and return to baseline phases.

Only two known applications of OBM in the medical industry have been reported that specifically targeted customer service. Slowiak et al. (2005) evaluated the effects of a combined intervention package (i.e., task clarification, goal setting, feedback, and contingent incentives) on the telephone customer service of appointment coordinators in a medical clinic. They targeted three customer service behaviors: (1) using a standard greeting, (2) speaking in an appropriate tone of voice, and (3) using a standard closing. Implementation of an ABAB design resulted in overall performance increases for the three target behaviors by all participants during both intervention phases.
Patient waiting times were targeted in the second application of OBM in a medical setting. Nielsen (2004) improved patient satisfaction within a rural hospital’s emergency department (ED) by increasing nurse-patient communication with respect to waiting times. Triage nurses walked through the waiting room every half hour and explained any reasons for delays or extended wait times. Prior to this intervention, only 44% of ED patients rated their service as “excellent” or “very good.” In the month following the implementation of half-hour walk-throughs, these ratings doubled to 88%.

The literature reviewed above suggests that multi-component interventions are effective in a variety of settings and for an array of behaviors related to customer service. However, very few studies have been carried out within the medical industry – an industry in which high levels of customer service are often expected and desired. The present study was conducted in the outpatient pharmacy of a hospital in which long wait times had been reportedly long according to customer testimonials. In fact, the pharmacy had even lost customers due to dissatisfaction with wait times. Even management at the hospital perceived customer satisfaction with wait time to be relatively low. However, although the pharmacy had subjective information to suggest that wait times were long, objective data had not been collected with regard to wait time or customers’ level of satisfaction with wait time. Additionally, management at the hospital sought to reduce customer wait time in order to better serve its customers and increase customer satisfaction with its services.

Therefore, the objective of this study was to examine the effects of a single intervention versus a combined intervention package to reduce wait times in a hospital’s outpatient pharmacy. Customer satisfaction ratings were also collected to determine the
effect of a reduction in wait time on customer service satisfaction with wait time. The single intervention provided participants with feedback related to levels of customer satisfaction with wait times, whereas the combined intervention included customer satisfaction feedback, wait time feedback, and goal setting. We expected that the combined intervention would produce the greatest reduction in wait times because (1) participants received more direct feedback related to their performance (i.e., wait time feedback), and (2) participants were able to use a teamwork approach to improve their prescription filling process.
Method

Participants

Ten employees (7 females, 3 males) of the Outpatient Pharmacy within a large hospital in southwest Michigan participated in this study. Four of the 10 were pharmacists and six were pharmacy technicians. Participants' ages ranged from 20 to 56 years. The pharmacists had been employed with the hospital for approximately four years or less; pharmacy technicians' experience ranged from about seven months to 29 years. Eight participants worked full-time and two pharmacy technicians worked part-time; all worked eight-hour shifts between the hours of 6:00 a.m. and 6:00 p.m. At this particular pharmacy, the job roles of the pharmacists and pharmacy technicians were essentially the same. The only major difference was that the pharmacist was ultimately responsible for the final product (including any medication information provided to customers). Every other job task (e.g., insurance processing, prescription entry, ordering stock, customer communication, cashiering, sweeping the floors, etc.) could be completed by either a pharmacist or a technician. The pharmacy could not be open without a pharmacist on duty.

At the time of this study, employee performance was reviewed on an annual basis. Performance issues requiring immediate attention were handled in between annual performance reviews. Feedback on timely service and customer satisfaction with service had never been objectively collected. The Outpatient Pharmacy Manager perceived that a reasonable level of "wait time" would be approximately 20 minutes; however, data had not been collected to determine whether this level of wait time would satisfy or be acceptable to their customers. Prior to this study, there were no contingencies in place to
promote competent overall performance. Annual raises were given at the time of the employees’ performance reviews. However, employees did participate in a gainsharing program, in which each department set a goal related to a particular service they provide (e.g., Outpatient Surgery Prescriptions); if the goal was met each quarter, gainsharing profits were disbursed.

Management had introduced this study as a Performance Improvement (PI) project for the employees in the Outpatient Pharmacy. As with other PI projects that the employees had been involved in, participation was required for evaluation purposes. The same mandatory participation applied to this study; however, employees were informed of their participation prior to the start of the study, and data collected during the study did not include any identifying information. Management (i.e., Vice President, Executive Director, Pharmacy Director and Outpatient Pharmacy Manager) were asked to provide a site approval letter, allowing for recruitment and data collection, along with permission to use data for publication and presentation purposes. This study was approved by both the site’s Institutional Review Board (Appendix A) and Western Michigan University’s Human Subjects Institutional Review Board (Appendix B).

Setting

The study site was a 343-bed hospital that provided both inpatient and outpatient medical services. The Outpatient Pharmacy is housed on the first floor of the hospital and shares physical space with the hospital’s gift shop. The pharmacy’s hours of operation are Monday through Friday from 7:30 a.m. to 5:30 p.m. The pharmacy consists of an employee work area and a customer waiting area, which are divided by a wall with two windows. Customers bring their new or refill prescriptions to the “Drop Off” window and
receive their filled prescriptions at the “Pick Up” window. The basic elements of the employee work area include: (1) shelves and refrigerators containing prescription medications, (2) a wall of drawers identified by an alphabetic letter for sorting filled prescriptions by customers’ last names, (3) a long counter (approximately 10 feet long) located between the two windows where prescriptions are filled, (4) a cash register near the “Pick Up” window, and (5) computer stations used to enter and access patient information.

Apparatus and Materials

Customer service card. Customer service cards were used to collect wait time data. These cards (Appendix C) were the size of an index card (approximately 4 x 6 inches) and included a header to identify the cards as related to this study (i.e., Bronson Hospital Outpatient Pharmacy Customer Service). Below the header was space to fill in the number of prescriptions dropped off, to check the type of prescription(s) dropped off (i.e., “new,” “refill,” or “both”), and to stamp the date and time each prescription was dropped off and picked up.

Time stamp machines. Two identical time stamp machines were used to stamp the time on a Customer Service Card as a prescription(s) was dropped off and picked up by a customer who was going to stay in the waiting area until his or her prescription(s) was filled. One was located near the “Drop Off” window and the other near the “Pick Up” window; the employee working at each of these windows was responsible for using the time stamp machine. These digital time stamp machines looked like a clock and stamped the current date, time and a message (e.g., “in”) when they were pressed and held down onto a piece of paper. The “in” and “out” messages were preset onto each time stamp
machine. The “in” message was preset on the time stamp machine used at the “Drop Off” window, whereas the “out” message was preset on the one used at the “Pick Up” window.

*Customer satisfaction survey box and tokens.* A customer satisfaction survey box was located near the “Pick Up” window in the customer waiting area, yet out of the line of sight of pharmacy employees. Similar to Brown and Sulzer-Azaroff (1994), this survey box was used to collect data on customers’ satisfaction with the amount of time they waited to have their prescription filled. The survey box contained dividers to form five smaller boxes within it. Each smaller box had a slot labeled “extremely satisfied,” “very satisfied,” “satisfied,” “somewhat satisfied,” or “unsatisfied.” There also was a sign placed next to the box asking customers to place their token (i.e., poker chip) in the slot that described the level of their satisfaction with the amount of time they waited to have their prescription(s) filled.

*Data collection forms.* The experimenter completed the Wait Time Data Collection Form (Appendix D) each day. This form provided space to record the Customer Service Card ID, the number of prescriptions dropped off by a waiting customer, the type of prescription(s) dropped off, the time the prescription(s) was dropped off, the time it was picked up, and the wait time for each customer (time elapsed between drop off and pick up). Spaces for the date and session number were also included on this form.

A Customer Satisfaction Form (Appendix E) was also completed each day. This form provided space to record the number of tokens deposited into each category of the customer satisfaction survey box on each day of one week (Monday – Friday). Spaces for
the dates and session numbers were also included, along with an area to calculate totals and response rates for each day.

A Reliability Data Collection Form (Appendix F) was completed to assess whether participants engaged in behaviors required for collecting accurate measures of wait time and customer satisfaction with wait time. This form provided space to record behaviors of employees working at both the “Drop Off” and “Pick Up” windows (see Procedural integrity within sections titled Wait Time and Customer Satisfaction). Spaces for the date, time, and session number were also included.

**Dependent Variable 1 – Wait Time**

*Response definition.* Wait time was defined as the amount of time elapsed between the times that a prescription(s) was dropped off and picked up by customers remaining in the waiting area (i.e., waiting customers). Wait times were calculated for each customer using the data collection form, and the average wait time per day was computed as the total amount of time customers spent waiting for their prescriptions to be filled divided by the total number of customers.

*Recording procedures.* Data were collected daily on all prescriptions that were dropped off by waiting customers. When a customer brought a new or refill prescription to the “Drop Off” window, the participant working at the “Drop Off” window asked each customer if he or she was going to stay in the waiting area until his or her prescription(s) was filled. If the customer stated he or she would wait for the prescription(s), the participant used the time stamp machine to stamp the current time on a Customer Service Card, gave the card to the customer, and asked the customer to give the card to cashier when he or she picked up his or her prescription(s).
When a prescription(s) for a waiting customer was filled and ready to be picked up, the customer’s name was called, and the customer proceeded to the “Pick Up” window. The participant working at the cash register (i.e., “Pick Up” window) stamped the current time onto the Customer Service Card when the customer presented his or her card as the customer picked up the filled prescription(s).

At the end of each day, the experimenter collected all of the Customer Service Cards that were time stamped. These cards were kept in a box near the “Pick Up” window. The “drop off” and “pick up” times indicated on the stamped cards were transferred to the Wait Time Data Collection Form. Individual wait times for each customer were calculated, along with the day’s overall average wait time per customer. The average wait times were graphed daily in order for the experimenter to observe trends over time.

*Procedural integrity.* At the beginning of each week, the experimenter verified that the time stamp machines were accurate (i.e., both machines were synchronized and the correct time, date, and message was displayed). In addition, observations were conducted randomly throughout the duration of the study to ensure that participants (i.e., employees) were (1) asking customers if they were going to wait for their prescription(s) to be filled, (2) using the time stamp machine to stamp a Customer Service Card and then giving the stamped card to the customer when he or she dropped off his or her prescription(s), and (3) using the time stamp machine to stamp a Customer Service Card when it was presented by a waiting customer as that customer picked up his or her prescription(s).
Using the Reliability Data Collection Form, the experimenter and, when available, the Outpatient Pharmacy Manager directly observed employees at the “Drop Off” and recorded whether three behaviors occurred or did not occur: (1) the employee asked the customer if he or she is going wait, (2) the employee stamped a Customer Service Card for waiting customers before the customer left the “Drop Off” window, and (3) the employee gave a stamped Customer Service Card to waiting customers before the customer leaves the “Drop Off” window. In addition, employees at the “Pick Up” window were directly observed to record whether or not the employee stamped a Customer Service Card presented by waiting customers before the customer left the “Pick Up” window.

Percent agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplying that number by 100. An agreement was scored when both observers identified that the aforementioned behaviors either occurred or did not occur. A disagreement was scored when there was any discrepancy between the observations of the experimenter and the second observer.

**Dependent Variable 2 - Customer Satisfaction**

*Response definition.* Customers’ satisfaction with wait time was measured by counting the number of tokens in each satisfaction slot of the survey box. The employee at the “Drop Off” window (i.e., receiving the prescription(s) that needed to be filled) gave customers a token and asked them to participate in the survey by depositing their token in the appropriate slot in the survey box located near the “Pick Up” window after they had received their filled prescription. The employee at the “Pick Up” window also prompted
the customer to place his or her token in the survey box before the customer left the pharmacy.

*Recording procedures.* Customer satisfaction with wait times was collected daily. Each morning, the experimenter provided participants with a container of 100 tokens that was placed near the “Drop Off” window for participants to give to customers. At the end of each day, the experimenter counted and recorded on the Customer Satisfaction Form the number of tokens deposited in each category (extremely satisfied, very satisfied, etc.). The total number of tokens in the survey box was divided by the total number of tokens given out to determine the customer response rate for that day. The daily average level of customer satisfaction with wait times was graphed daily and compared with the graph of daily average wait times to observe for a relationship between wait time and customer satisfaction. The percentage of tokens in each satisfaction category was also graphed each day.

*Procedural integrity.* Procedures were in place to verify that employees were handing out the tokens to those customers who indicated they would remain in the waiting area to pick up their prescription(s). Using the same observations as previously discussed (see section titled *Wait Time*) and the same Reliability Data Collection Form, the experimenter and Outpatient Pharmacy Manager observed and recorded whether (1) tokens were being dispensed to waiting customers before the customer left the “Drop Off” window and (2) the employee working at the “Pick Up” window reminded the waiting customer to participate in the survey. Percent agreement was calculated by dividing the number of agreements by the total number of agreements and disagreements and multiplying that number by 100. For observations at the “Drop Off” window, an
agreement was scored when both observers identified that the participant gave or did not give a token to a waiting customer when he or she dropped off the prescription to be filled. For observations at the “Pick Up” window, an agreement was scored when both observers identified that the participant reminded or did not remind the waiting customer to participate in the survey. A disagreement was scored when there was any discrepancy between the observations of the experimenter and the manager.

Social Validity

The social importance of both customer wait times and customer satisfaction has been identified and examined previously in the literature review. To further examine the social validity of wait times in this study, customer satisfaction with wait times (as described above) was assessed. The relationship between these two variables was analyzed to determine whether customer satisfaction would increase if wait times were reduced.

General Procedures

Wait time and customer satisfaction data were collected daily (Monday-Friday) between the hours of 7:30a.m. and 5:30p.m. Data were collected on the performance of participants as a group and not as individuals. The process for filling prescriptions required that all participants engage in some part of the process (i.e., one individual participant was not responsible for the entire process by him or herself). Participants were oriented to the study during their monthly Outpatient Pharmacy staff meeting. Prior to the study’s start date, all participants were shown and trained to use the time stamp machines to collect wait time data and to dispense tokens to customers to collect customer satisfaction data. Training was done in the participants’ work environment using
modeling and role-play techniques. The experimenter showed participants how to use all of the apparatus and materials necessary to collect the wait time and customer satisfaction data (i.e., time stamp machines, customer service cards, tokens). In addition, participants practiced using these materials while the experimenter role-played the part of a customer. Training took approximately 30 minutes. Formal data collection commenced once all employees had been trained.

Levels of the Independent Variable Phase Conditions

Baseline (A). During baseline, data were collected on wait times and customer satisfaction using the procedures described above. Programmed consequences (feedback and goals) were not provided by management or the researcher during this phase. It is possible that participants came in contact with natural contingencies, such as positive reinforcement from customers whose wait times were short or negative feedback from those whose wait times were long.

Customer satisfaction feedback (B). Customer satisfaction data were transferred from the Customer Satisfaction Form into a spreadsheet program (i.e., Microsoft Excel) and were graphed to show the daily percentage of tokens in each satisfaction category. Graphical feedback was shared with participants daily by emailing a copy of the graph with the previous day’s data (Figure 1) to each participant’s work email account, along with posting a copy of the graph in a highly visible location in the participants’ work area (i.e., communication board).

Customer satisfaction feedback, wait time feedback, and goal setting for wait time reduction (C). Feedback on customer satisfaction was provided to participants as described in Phase B. In addition, wait time data were transferred from the Wait Time
Data Collection Form into Microsoft Excel, and data were graphed to show average daily wait times and trends over time. Wait time feedback was provided to participants using the same procedures for providing feedback on customer satisfaction.

Figure 1. Customer satisfaction feedback graph posted during phases B and C.

Finally, weekly goals were set for wait time reduction using a participative approach to encourage teamwork among participants. The Outpatient Pharmacy Manager met with participants at the beginning of each week to facilitate goal setting and ensure that goals were reasonably set such that they are not too easy or difficult to attain. The manager used the participants' previous wait time data when determining the goals for wait time. The initial weekly wait time goal was to be set within four minutes above or below the lowest average weekly wait time attained. Once the goal was attained, then a new, higher goal (i.e., lower weekly wait time) was set for the following week. A goal
line appeared on the wait time feedback graph so that participants could compare their performance to the goal (Figure 2).

![Average Daily Wait Time Graph](image)

Figure 2. Average daily wait time feedback graph posted during phase C.

**Integrity of the Independent Variable**

To ensure that participants received and looked at the customer satisfaction and wait time feedback emailed to them, the researcher used an option in the email program that sent the researcher a notification email when documents had been opened and viewed by recipients. To ensure that participants viewed posted feedback graphs, participants were required to sign their initials on the posted graph. To ensure that appropriate goals were set each week, the researcher conversed with the Outpatient Pharmacy Manager prior to each goal-setting meeting and was present at most meetings.
to help facilitate the goal setting process and to keep a record of all goals set by the
group.

*Experimental Design*

A within-subject reversal design was used to assess both wait times and
customers' levels of satisfaction with their wait times. Participants were exposed to the
no feedback/no goal setting, feedback, and feedback with goal setting conditions in an
ABCB sequence, where A = Baseline (no feedback and no goal setting), B = Customer
Satisfaction Feedback, and C = Customer Satisfaction Feedback, Wait Time Feedback,
and Goal Setting for Wait Time Reduction. Data were collected and phase changes
occurred only when performance was judged to be stable upon visual inspection. The
initial stability criterion was set such that performance could vary 10% above or below
the average performance in a given phase during the last five observations of that phase.
After baseline data were collected for 24 sessions, it was apparent that the initial stability
criterion was unrealistic and would have to be abandoned if the study were to be
completed in the available time. Consequently, each Customer Satisfaction Feedback (B)
phase was terminated arbitrarily after 15 days if the stability criterion was not met. The
combined intervention phase, C, was terminated after two consecutive weeks of not
having met the weekly wait time goal of 16 minutes.

A final Follow-Up (FU) phase was added at the request of management.
Approximately one month after the study ended, follow-up data were collected on a
weekly basis for six weeks. The day of the week on which data were collected,
Wednesday, remained the same because it was judged to be the most stable of all
weekdays throughout the entire duration of the study. Conditions during Follow-Up were the same as the initial Baseline phase.
Results

*Wait Time*

Figure 3 shows the average daily wait time for each session during all study phases, including the six-week follow-up phase. During baseline, the average daily wait time ranged from 14 to 31 minutes with a mean of 21.00 (SD = 4.75). The average weekly wait time ranged from 19 to 23 minutes. During the single intervention phase, employees received feedback regarding customers' satisfaction with their wait times. The average daily wait time ranged from 13 to 23 minutes with a mean of 18.53 (SD = 2.88). The average weekly wait time during this phase ranged from 17 to 21 minutes. The second intervention phase included a combined intervention package consisting of customer satisfaction feedback, average daily wait time feedback, and goal setting. During this phase, the average daily wait time ranged from 12 to 24 minutes with a mean of 17.79 (SD = 2.73). The average weekly wait time during this phase ranged from 16 to 21 minutes. The fourth phase of the project was a reversal to the single intervention phase, and the average daily wait time ranged from 14 to 27 minutes with a mean of 20.87 (SD = 3.76). The average weekly wait time during this phase ranged from 19 to 22 minutes. During the six-week follow-up phase, daily wait times ranged from 17 to 27 minutes with a mean of 22.50 (SD = 3.94).

*Customer Satisfaction with Wait Time*

Figure 4 shows the average daily level of customer satisfaction with wait time for each session during all study phases, including the follow-up phase. Customer satisfaction was rated on a scale of 1 to 5, where 1 = unsatisfied, 2 = somewhat satisfied,
Figure 3. Average daily wait time for all study phases and follow-up sessions.

Figure 4. Customer satisfaction with wait time during all study phases and follow-up sessions.
3 = satisfied, 4 = very satisfied, and 5 = extremely satisfied. During baseline, the level of customer satisfaction ranged from 2.67 to 4.45 with a mean of 3.80 (SD = .42). During the single intervention phase, the average level of customer satisfaction ranged from 3.69 to 4.41 with a mean of 3.91 (SD = .20). The level of customer satisfaction with wait time ranged from 3.40 to 4.29 with a mean of 3.90 (SD = .22) during the second, combined intervention phase. During the reversal to the single intervention phase, the average daily level of customer satisfaction ranged from 3.33 to 4.29 with a mean of 3.75 (SD = .29). During the six-week follow-up phase, the level of customer satisfaction with wait time ranged from 2.70 to 3.94 with a mean of 3.25 (SD = .54). The overall average rating was 3.72 on the scale of 1 to 5. This rating illustrates that customers' satisfaction was near the 'very satisfied' rating.

**Relationship between Wait Time and Customer Satisfaction**

A visual analysis of daily average wait times and daily satisfaction ratings showed a substantial, negative relationship between customer satisfaction with wait times and the actual wait times. As wait times increased, customer satisfaction ratings decreased; as wait times decreased, customer satisfaction ratings increased. A Pearson product-moment correlation coefficient computed between wait time and customer satisfaction quantified the visual impression; \( r = -0.57, p < .05 \).

**Procedural Integrity of Dependent Variables**

As described earlier, observations were conducted randomly throughout the duration of the study to assess whether participants engaged in behaviors required for the collection of accurate measures of wait time and customer satisfaction with wait time. Four hundred seventy-one customer interactions were observed between the “Drop Off”
and “Pick Up” windows, of which 379 were waiting customers. The Outpatient Pharmacy Manager’s schedule did not allow her to act as a second observer as much as initially anticipated. Therefore, interobserver reliability was computed on 8% of the total number of waiting customer interactions observed. However, there was 100% agreement between the observations made by the experimenter and the Outpatient Pharmacy Manager.

Six behaviors were observed: (1) asking the customer if he or she was going wait, (2) stamping the Customer Service Card at the “Drop Off” window, (3) giving the stamped card to the customer, (4) dispensing tokens to waiting customers, (5) stamping the Customer Service Card at “Pick Up” window, and (6) reminding the waiting customer to participate in the survey. These behaviors occurred during 97.3%, 97.3%, 97.3%, 96.8%, 100%, and 88% of the total observed interactions, respectively.
Discussion

The present study was an attempt to reduce wait times and increase customer satisfaction with wait times in an Outpatient Pharmacy setting. As stated earlier, the Outpatient Pharmacy Manager perceived that a reasonable “wait time” would be approximately 20 minutes. The results of the present study demonstrate that the average daily wait time was 21 minutes during the baseline condition. However, in response to customer testimonials of dissatisfaction with wait times and the variability in wait time data, interventions were implemented to assess the effects of a reduction in wait times on customers’ satisfaction and to reduce the variation in day-to-day average wait times.

This study demonstrates that both the single and combined interventions produced reductions in the amount of time customers waited for their prescriptions to be filled. In addition, the variation in average daily wait times decreased during intervention phases, reducing both the maximum daily average number of minutes waited and the range of daily average minutes waited. Related to this, the minimum daily average wait time also decreased below the baseline minimum during both intervention phases, with the lowest daily average wait time occurring during the combined intervention phase. An increase in the average daily wait time was observed during the reversal to the single intervention phase. Interestingly, data during this phase more closely resembled those that were observed during the initial baseline phase. The highest average wait time for any phase was detected during the follow-up period.

Customer satisfaction with wait time remained fairly steady on average throughout the entire duration of the project, improving only slightly during both intervention phases. As mentioned earlier, prior to the start of the present study,
management's perception was that customer satisfaction with wait times was relatively low. However, the findings of this study illustrate that during the study, only 5% (N=115) of waiting customers who participated in the survey (N=2,434) were unsatisfied with their wait time. Therefore, 95% of these customers were at least somewhat satisfied with the amount of time they waited; more specifically, 64% of waiting customers reported they were either 'very satisfied' or 'extremely satisfied' with their wait time. The highest percentage of unsatisfied customers during any phase (10%) was detected during the follow-up period.

The pharmacy in which this study was conducted processes a high volume of prescriptions each day, filling an average of approximately 370 prescriptions per day. Thus, there are many variables that may account for the variability in any individual customer's wait time, which ultimately affects the daily average wait times. These variables include, but are not limited to: number of prescriptions being processed at any given time, number of waiting customers, complexity of prescriptions, number of prescriptions dropped off by individual customers, insurance problems, and incorrectly written/processed/filled prescriptions. Data on the number of prescriptions processed each day were available, and a statistical analysis of these data revealed a positive relationship between the number of prescriptions processed per day and the actual wait times; r = 0.44, p < .05. Thus, as the number of prescriptions processed daily increased, so did the customer wait times.

The aforementioned variables appeared to affect levels of customer satisfaction; that is, the data reveal a pattern in which the number of 'unsatisfied' customers was associated with the number of long wait times on any given day. The most common
reasons for longer wait times during this study included insurance problems, prescription problems, and failure to mark prescriptions for waiting customers as “Priority” orders.

A weakness of the present study is that a consistent downward trend in average wait times was not seen during the combined intervention phase (C). Although wait time reduction goals were determined and set by the team of employees, this teamwork approach does not appear to be very effective. The experimenter observed that some employees were willing to try the new ideas decided upon by the team while others were not. Some of the goals included increasing communication among employees (e.g., letting pharmacists know when “priority” prescriptions needed to be checked) and making small changes to the current prescription-filling process (e.g., marking only those prescriptions for waiting customers as “priority”). One reason for the observed lack of adherence to goals may be that goal setting without reinforcement or other performance management contingencies may not be effective in changing performance.

The teamwork approach was used in conjunction with the organization’s culture; however, a standardized filling process may have been more effective in reducing wait times by streamlining some of the procedures. At the time of this study, different employees were observed to perform the same task (e.g., processing a prescription) using a variety of methods. This may be due to improper training of procedures or the lack of effective consequences to perform tasks in the desired manner. It should be noted that many of the employees were previously employed in other pharmacy settings performing tasks similar to those of their current position; perhaps some of their current, undesirable performance had transferred from their previous employment to their current positions.
Enforcement of effective performance management contingencies may be one solution to extinguish these undesirable behaviors and train new, desirable behaviors.

In addition, a standardized process may make individual employees accountable for their work, instead of the team being accountable as a whole. If each employee was responsible for a particular part of the prescription-filling process, along with other pharmacy tasks (e.g., ordering, stocking, etc.), individual performance and contributions to the process could be objectively measured and evaluated. At the time of this study, employees (as a team) were accountable for all parts of the prescription-filling process, making it hard to determine who was responsible for the tasks that needed to be completed. Observation of everyday workflow revealed that employees generally worked on one part of the process at a time (e.g., processing, filling, checking, etc.); however, employees would sometimes leave their ‘workstation’ to cover for another employee at times that were both appropriate (e.g., employee went on break) and inappropriate (e.g., employee was not at their workstation when they should have been).

Another weakness of the present study may be the subjectivity of the second dependent variable – customer satisfaction with wait time. Although waiting customers were told to place their token in the survey box according to their level of satisfaction with their wait time, we cannot be sure that customers’ responses were really based on satisfaction with their wait time or if they based their response on general customer service overall. In addition, customer satisfaction is a subjective variable by nature. Two customers may not agree on the level of satisfaction they feel toward the same exact wait time. For example, a wait time of 20 minutes might be very satisfying to one customer, while another customer might find 20 minutes to be unsatisfactory.
The study appears to have several strengths. First, the duration of data collection
was 89 days, allowing for at least 15 days of data collection per phase (not including
follow-up). In an analysis of 881 studies published in JABA between the years of 1968
and 1977, the most frequent number of observations during the initial baseline phase was
between three and four. Subsequent phases tended to include even few observations than
this (Huitema, 1985; Huitema, 1986). Therefore, even though the ABCB experimental
design used in the present study posed some limitations, we feel confident in our findings
due to the longevity of data collection. Furthermore, the follow-up phase allowed for the
additional analysis of a second ‘baseline’ condition.

A second strength of the present study is that measurement systems for assessing
wait time and customer satisfaction were developed, both of which did not previously
exist within this setting. These measurement methods were designed such that they would
be easy to implement and could be used in the future if desired. Although employees
reported that giving out the Customer Service Cards and tokens was cumbersome at first,
they stated that these procedures became more manageable and habitual as time went by.
Management had mentioned they may, in the future, use one or both of these
measurement systems to occasionally assess wait time and satisfaction and compare
obtained results to the findings of this study.

Finally, the customer response rate for level of satisfaction with wait time was
very high (95%). This result is similar to Brown and Sulzer-Azaroff (1994), further
demonstrating the effectiveness of this type of data collection method. The response
effort of dropping a token into a survey box is much less than having to fill out a
customer satisfaction survey questionnaire. Even higher response rates may have been
seen if all customers had been reminded at the “Pick Up” window to participate in the survey.

The results of the current study are generally consistent with those of previous OBM and customer service related research. Feedback was found to be an effective intervention alone; however, when combined with goal setting, the combination of both produced greater reductions in wait time. This supports previous reviews of feedback (Balcazar et al., 1985/1986) and goal setting (Fellner & Sulzer-Azaroff, 1984), along with customer service studies employing multi-component interventions (e.g., Eikenhout & Austin, 2005; Slowiak et al., 2005). Furthermore, during the combined intervention, participants were given more direct and informative feedback related to their performance (i.e., wait time feedback). The graphic feedback during this phase allowed employees to compare the current day’s average wait time with wait times for all previous days in that phase. Reviews of the effectiveness of performance feedback suggest that feedback which allows the comparison of previous and current group performance produces more consistent and desirable effects (e.g., Alvero et al., 2001; Balcazar et al.).

The findings of the present study are likely to generalize to other similar pharmacy settings, such as those which process a higher volume of prescriptions on a daily basis. In addition, we would expect comparable results in any customer service setting where many different variables might affect a customer’s wait time with an order he or she has placed. For example, a fast-paced restaurant may struggle with a high volume of customers and may run into problems preparing an order or entering an order incorrectly. Similarly, results may generalize to any busy setting in which customers
stand in lines for prolonged periods of time (e.g., customer service counters and airports). One would expect that reducing wait times in any of those settings would increase customer satisfaction with wait times and customer service overall.

Few OBM applications targeted at increasing customer service behaviors have also evaluated the effects of these interventions on customer satisfaction (e.g., Brown & Sulzer-Azaroff, 1994; LaFleur & Hyten, 1995). Future research should continue to examine whether efforts to increase customer service behaviors impact customer satisfaction and customer behavior. Similarly, a more objective measure of customer satisfaction with services provided may result in valuable and more useful information for the researcher. This information may help to pinpoint specific customer service behaviors which are important to an organization’s customers. In addition, more research is needed in highly variable, applied settings to aid in our understanding of how we can gain tighter experimental control in such settings. Research in such settings is necessary for the future of applied studies, as the most successful organizations are those which are constantly changing and adapting to their external environment, which includes demanding customers with high expectations.
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Appendix A

Bronson Methodist Hospital IRB and Site Approval Letters
To Whom It May Concern:

Julie Slowiak has developed and proposed the project entitled "Reducing Wait Times in a Hospital Pharmacy to Promote Customer Service," and we have approved this project to be carried out in the Outpatient Pharmacy at Bronson Methodist Hospital in Kalamazoo, Michigan pending approval from both Western Michigan University's Human Subjects Institutional Review Board (HSIRB) and Bronson's HSIRB.

We support the project protocol and have had the opportunity to ask questions and give suggestions. We are aware of the participant requirements to recruit Outpatient Pharmacy employees for participation in this research study. Additionally, we approve the use of any data collected by Julie Slowiak for future analysis, publication, and presentation purposes. Bronson Methodist Hospital requires shared access to the results of data collection in this study. Bronson also requires acknowledgment as a participating facility in any publication or oral presentation.

If you have any further questions, please contact Holly Wagner, Outpatient Pharmacy Manager, at 269-341-6990.

Sincerely,

Holly Wagner  
Outpatient Pharmacy Manager

Jacqueline Wahl  
Executive Director

Katie Harrelson  
Vice President
Bronson Methodist Hospital Institutional Review Board (IRB) has approved the above referenced protocol through Expedited Review and determined the continuing review interval for this study to be set at:

- 1 month
- 2 months
- 3 months
- 6 months
- X 12 months

**A Protocol Continuing Review will be required before this date to continue this study.**

Research must be conducted according to the protocol version approved. The clinical investigator is required to receive approval from the IRB before initiating any changes in the approved protocol or its related informed consent (if applicable) during the period for which it was approved. Adverse events must be reported promptly to the IRB. Each study participant should receive a copy of the informed consent document (if appropriate). Records must be retained for a minimum of three years.

CHAIRMAN'S COMMENTS:

Assurance: FWA00002688

James W. Carter, MD, FACP
Chair, Expedited Review Committee
Bronson Methodist Hospital
Institutional Review Board

Date: 6/14/05
Appendix B

Western Michigan University HSIRB Approval Letter
Date: June 9, 2005

To: Bradley Huitema, Principal Investigator
   Julie Slowiak, Student Investigator for thesis

From: Mary Lagerwey, Ph.D., Chair

Re: HSIRB Project Number: 05-05-15

This letter will serve as confirmation that your research project entitled "Reducing Wait Times in a Hospital Pharmacy to Promote Customer Services" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may only conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: June 9, 2006
Appendix C

Customer Service Card
BRONSON HOSPITAL
OUTPATIENT PHARMACY
CUSTOMER SERVICE

# of Prescriptions Dropped Off __________

☐ New  ☐ Refill  ☐ Both

Time Dropped Off:

Time Picked Up:
Appendix D

Wait Time Data Collection Form
# WAIT TIME DATA COLLECTION FORM

Date: ____________________  Session #: __________

<table>
<thead>
<tr>
<th>Card ID#</th>
<th># Dropped Off</th>
<th>Type Dropped Off (1=New, 2=Refill, 3=Both)</th>
<th>Time Dropped Off</th>
<th>Time Picked Up</th>
<th>Wait Time (minutes) (Time Picked Up – Dropped Off)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

**Total Wait Time (minutes)**: [Blank]

Average Wait Time = Total Wait Time / Number of Cards Collected (Customers) = [Blank]
Appendix E

Customer Satisfaction Form
CUSTOMER SATISFACTION FORM

Dates: ____________________  Session #’s _____________

<table>
<thead>
<tr>
<th>RATING</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsatisfied (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat Satisfied (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfied (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Satisfied (4)</td>
<td></td>
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<tr>
<td>Extremely Satisfied (5)</td>
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<td></td>
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</tr>
</tbody>
</table>

TOTAL # TOKENS IN SURVEY BOX

TOTAL # TOKENS GIVEN OUT
(500 – remaining tokens)

RESPONSE RATE
(# in survey box / # given out)
Appendix F

Reliability Data Collection Form
### RELIABILITY DATA COLLECTION FORM

Date: ____________________  Time: ______________  Session # __________

Primary Observer: Julie Slowiak, Experimenter  Secondary Observer: ___________

### DROP-OFF WINDOW

<table>
<thead>
<tr>
<th>Observation</th>
<th>Asked Customer if He/She was Going to Wait</th>
<th>Stamped Card Before the Customer Left the Window</th>
<th>Gave Card to Customer Before the Customer Left the Window</th>
<th>Gave Token to Customer Before the Customer Left the Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>2</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>3</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>4</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>5</td>
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<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
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<tr>
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<td>Y  N</td>
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<tr>
<td>10</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
</tbody>
</table>

### PICK-UP WINDOW

<table>
<thead>
<tr>
<th>Observation</th>
<th>Stamped Card Before the Customer Left the Window</th>
<th>Reminded the Customer to Participate in the Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>2</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>3</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>4</td>
<td>Y  N</td>
<td>Y  N</td>
</tr>
<tr>
<td>5</td>
<td>Y  N</td>
<td>Y  N</td>
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<tr>
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<td>Y  N</td>
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<td>Y  N</td>
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