

# Processing Time Related to Patient Attitude in a Family Practice Residency Model Office

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This paper presents a time-motion study of patient processing in the Ball Memorial Family Practice Residency Model Office during a one-month time period. Time intervals including patient waiting time and patient processing time, ie, length of patient time spent in attendance by various health-care office personnel, were calculated. An assessment intended to reveal patients' attitudes in the context of their visits was performed. Correlation statistical analysis of the time-motion and attitude studies indicates that relatively negative patient attitudes are related to the length of time that the patient spends waiting for the doctor, the length of patient waiting time in the office, and the total time that the patient spends in the office.

The Model Office is an essential component of any approved Family Practice Residency Program.<sup>1</sup> The purposes of the Model Office are to provide primary medical care on a fee-for-service basis for families who have chosen to become part of the program and to serve as an educational experience in the training of family practice residents. The Ball Memorial Family Practice Residency Program requires approximately the following distribution of total training time to be spent seeing patients in the Model Office: first year residents, 10 percent; second year residents, 45 percent; and third year residents, 80 percent. A question frequently asked by the residents is whether or not the Model Office simulates that of a pri-

vate family physician particularly in regard to efficient utilization of physician and patient time.

This study was designed to assess utilization of the Model Office and family practice personnel as a function of time from the patients' viewpoint. Major areas of study include the following: (1) the extent to which patients fail to keep appointments or are late for their scheduled appointments; (2) the magnitude of patient processing and waiting time intervals during their visits; (3) an assessment of patients' attitudes regarding their office visits; (4) an investigation as to whether patient attitude is related to various waiting and processing time intervals; and (5) a comparison with similar studies conducted in both teaching and office settings.

The data may serve as a basis for making changes in the appointment system and/or Model Office organization in order to maximize physician time without prolonging patients' visits or producing negative patient attitudes.

A review of scientific literature reveals very little reporting of organized studies of patient processing. Anecdotal material appears to favor the appointment system and efficient utilization of patient as well as physician time.<sup>2,3,4</sup> A comparative study of pediatric private and university clinics has been reported.<sup>5</sup> A detailed time-motion study based on chief complaints has been utilized in making major changes in organization and personnel in a private family practice.<sup>6</sup> Patient processing in a large medical school-affiliated medical clinic has also been described.<sup>7</sup> An estimate of "cost of waiting time" per patient has been described in a large outpatient clinic.<sup>8</sup>

## Description of Model Office Organization

The Family Practice Model includes approximately 6,000 square feet on the first floor of a three-story building separate from the hospital. Located in Wing A are six general purpose examination rooms, one pediatric examination room, and one consultation room. In Wing B are five general purpose examination rooms, one pediatric examination room, and one minor surgery and casting room. The average examination room is 10 x 15 feet. The nurses' station and laboratory are centrally located between the two wings.

Patient flow through the model is diagrammed in Figure 1. Flow is generally one-way through major personnel contacts except for an occasional

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patient who after seeing the doctor has some laboratory test generated in the Model laboratory and then sees the doctor a second time for discussion of the results prior to leaving the office.

Family Practice Model Office personnel consist of the following: two receptionists, one registered nurse, two licensed practical nurses, four to five senior nursing students, one laboratory technician, and four or five family practice residents during a morning or afternoon block of assigned office-hour time. Residents are scheduled for a block of office-hour time such that residents in different levels of training will be seeing patients during the same block of time. There are five third year residents, four second year residents, and three first year residents. Each resident has his/her own group of assigned families which are followed during the three-year residency.

Practically all patients (approximately 98 percent) are scheduled by appointment with their assigned doctor. The amount of time scheduled per patient depends upon the nature of the visit, eg, office call, 15 minutes; complete history and physical examination, 30 to 45 minutes; and counseling session, 30 to 60 minutes. Each resident is assigned a nurse and two examination rooms during his/her office-hour time.

## Methods

A 5 x 8 inch card was used for data collection. It consisted of instructions to the patient, an area for stamping times at major patient-personnel encounter points (Figure 2), and a form for attitude assessment on the reverse side of the card (Figure 3).

Data were collected for all scheduled patient visits from February 28, 1974, through March 29, 1974. Data from February 28 and March 1 were regarded as a trial run to familiarize the personnel with the method of data collection and are not included in any of the statistical information. The data analyzed were obtained during four full, five-day work weeks from March 4 through March 29, 1974.

Automatic electric time clocks, synchronized and accurate to the nearest minute, were located in three strategic positions in the office Model and used by family practice personnel.

Each scheduled patient was given a

data collection card with his/her appointment time and arrival time stamped by the receptionist. Thereafter the patient presented this card to the family practice personnel encountered during the visit. Each of the personnel stamped the time of encounter or disencounter with the patient. At the conclusion of the visit the receptionist stamped the time and checked for completeness of response to the attitude study. There was no attempt to link specific patients or family practice personnel with particular data cards returned. Cards which contained incomplete time recordings were excluded from the analysis.

Early in the collection of data it was apparent that many patients were unable to perform the attitude assessment. Occasionally verbal instructions were offered by personnel but at no time was the assessment performed by anyone other than the patient, with the exception of parents' filling it out for children brought by them to the office. Several patients were unable to read or interpret the instructions. Many patients found parts of the attitude study confusing or did not respond to particular statements. For these reasons the family practice personnel were polled concerning which statements of the ten listed were judged to be most direct and to which a person of average intelligence could unequivocally respond. Based on this poll, only statements 1, 2, 7, 8, and 9 were used in establishing attitude scores. Those who did not respond to these specific statements were not included in the attitude study but were included in the time-motion study.

All time intervals and scores on attitude assessment for each patient were coded on keypunched computer cards. The derived descriptive statistics were calculated on an IBM 360, Model 50 computer.

Table 1 contains general statistical information concerning the magnitude of the patient population and the actual numbers of cases analyzed in the study. The figure of 890 patients processed during a four-week period is representative of the average monthly patient load for the Family Practice Model Office at Ball Memorial Hospital. Of that number, 12 patients did not return cards and are therefore uncountable. Of the total cards returned, 198 were unusable for the

time-motion study because of incompleteness, eg, not stamped for time of leaving the office, and 438 had incomplete attitude studies as defined above. Of all patients processed, 76 percent returned data usable for the time-motion study and 49 percent were usable for the time-motion correlation with attitude. Sixty-one percent of the patients who returned completed time cards arrived early or exactly on time for their appointments and 37 percent arrived late.

## Results

Statistical information concerning time intervals for patient flow through the Model Office are recorded in Table 2. Total processing time consists of time intervals during which the patient was being attended to by personnel, ie, nurse processing plus doctor processing plus laboratory technician processing. Total waiting time consists of waiting for nurse plus waiting for doctor plus waiting for laboratory technician plus waiting to sign out of office. Included under waiting for laboratory technician and processing by laboratory technician is one patient who was sent for x-rays and returned to the office and a few patients who obtained electrocardiograms in the office which are generally done by a nurse. A factor intended to relate processing and waiting times for each patient is obtained by

$$\frac{\text{total processing time}}{\text{total waiting time}}$$

for each patient.

It is noted that the average patient spent approximately equal amounts of time in waiting and processing. The average total time in the Model Office is 55.5 minutes including all types of visits, eg, office call, counseling, minor surgery.

Approximately 13 percent of the patients passed through all major points of personnel-patient encounter. The average patient passing through all major encounters in the office may have his/her time distributed as in Figure 4. In this figure total time consists of the sum of the individual time intervals as listed in Table 2. The average total time obtained in this way is 68 minutes and differs from the actual average total time for the entire population of 55.5 minutes by 12.5 minutes because relatively few of the



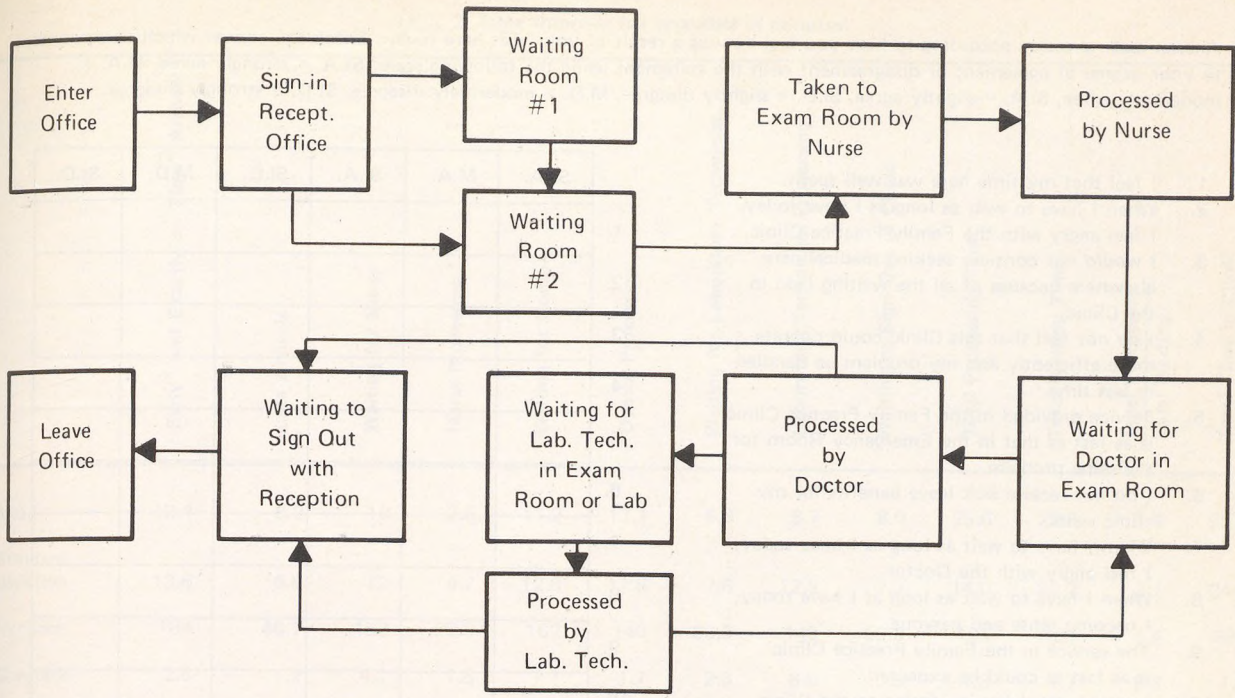


Figure 1. Patient Flow through Model Office

- \_\_\_\_\_ Appointment Time
- \_\_\_\_\_ Arrival Time
- \_\_\_\_\_ First Seen by Nurse
- \_\_\_\_\_ Nurse Finished
- \_\_\_\_\_ First Seen by Doctor
- \_\_\_\_\_ Doctor Finished
- \_\_\_\_\_ First Seen by Laboratory Technician
- \_\_\_\_\_ Finished with Lab
- \_\_\_\_\_ Signed Out of Clinic

PLEASE ANSWER ALL QUESTIONS  
 AFTER YOUR VISIT AT THE CLINIC IS  
 COMPLETED, PLEASE ANSWER THE QUESTIONS  
 ON THE BACK OF THIS CARD.

Dear Family Practice Patient:

The purpose of this sheet is to gather information concerning the amount of time you spend waiting in the Family Practice Clinic and attitudes related to your waiting. Through this evaluation we hope to improve our efficiency in seeing you so that your time spent here may be a more pleasant experience.

Please present this sheet to each member of the Family Practice Team (receptionist, Gay or Sharon; Nurse, Betty, Sarah, Gen, or Student Nurse; Lab. Assistant, Vickie; and your Doctor) at the time they acknowledge your presence and they will record the time.

Upon completing your visit to the Clinic, please answer the questions below and return this sheet to the receptionist.

Thank you.

Dennis L. Allen, MD  
 Family Practice Resident

Figure 2. Front of Data Collection Card — Institutions and Time-Motion Study



Answer each question according to how you feel *now* as a result of your visit here *today*. Check the answer which corresponds to your degree of agreement or disagreement with the statement using the following scale: St.A. = strongly agree, M.A. = moderately agree, Sl.A. = slightly agree, Sl.D. = slightly disagree, M.D. = moderately disagree, St.D. = strongly disagree.

1. I feel that my time here was well spent.
2. When I have to wait as long as I have today, I feel angry with the Family Practice Clinic.
3. I *would not* consider seeking medical care elsewhere because of all the waiting I do in the Clinic.
4. I *do not* feel that this Clinic could operate more efficiently and my problem be handled in less time.
5. Service provided in the Family Practice Clinic is as fast as that in the Emergency Room for the same problem.
6. I do not receive sick leave benefits for my clinic visits.
7. When I have to wait as long as I have today, I feel angry with the Doctor.
8. When I have to wait as long as I have today, I become tense and nervous.
9. The service in the Family Practice Clinic is as fast as could be expected.
10. I would not delay in coming to the Clinic just because of a delay in waiting to see the Doctor.

	St.A.	M.A.	Sl.A.	Sl.D.	M.D.	St.D.
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

PLEASE ANSWER ALL QUESTIONS.

Figure 3. Back of Data Collection Card - Attitude Survey

Table 1. Patient Population

Total patients scheduled	1,065
Total patients failing to keep appointment	175 (16%)*
Total patients processed	890
Total time cards returned	878
Total cards usable for time-motion study (of cards returned)	680 (76%)†
Total cards usable for time-motion correlation with attitude (of cards returned)	440 (49%)†
Total early or exactly on time arrivals	410 (61%)
Total late arrivals	252 (37%)
Total no appointment specified	18 (2%)
*percent of total patients scheduled	
†percent of total patients processed	

entire population were actually processed by the laboratory technician.

The attitude assessment is obtained from responses to statements 1, 2, 7, 8, and 9, all of which required a response in order to be correlated with the time-motion data for a specific patient. The responses are scored on a one to six scale with one corresponding to the most negative and six the most positive response. The scores for each of the five statements are averaged for each patient to produce a score reflecting a relatively positive or negative attitude. Descriptive statistics for the attitude study are in Table 3.

Pearson correlation coefficients relating the individual time intervals and average attitude score for each patient are determined. The coefficients and their respective values based on a two-tailed T test of significance are listed in Table 4.

Three time intervals are correlated significantly with attitude at the 95 percent or greater confidence limits. These correlations may be interpreted as follows: (1) the longer a patient spends in waiting for the doctor, the more negative is his/her attitude re-

garding the visit; (2) the longer a person spends in waiting (rather than in processing) in the office, the more negative is his/her attitude; and (3) the longer a patient spends in the office overall, the more negative is his/her attitude.

### Discussion

The average total visit time in the Model Office of 55.5 minutes favorably compares with times reported from other outpatient teaching models. Wegenke et al reported an average total visit time of 54.4 minutes in a university-based model pediatric teaching clinic. Described also in the same paper are two private pediatric practices with average total visit times of 27.5 and 45.4 minutes. They calculated total processing time which total waiting time resulted in 2:1 for the university-based model and 1:1 and 1:2 for the private practices (cf Table 2, this study 1.4:1). The systems used for scheduling patients in each office setting were not described.<sup>5</sup>

In a large university-affiliated medi-



Table 2. Time Intervals (all recorded in minutes)

	Early <sup>1</sup> and Exactly on Time <sup>2</sup> Arrivals	Late Arrivals	Waiting for Nurse	Nurse Processing	Waiting for Doctor	Doctor Processing	Waiting for Laboratory Technician	Laboratory Technician Processing	Waiting to Sign Out of Clinic	Total Processing Time	Total Waiting Time	Total Processing Total Waiting	Total Time in Clinic
Mean	13.4	8.2	10	7.5	11.2	17.1	5.8	8.7	8.0	25.6	29.8	1.4	55.5
Standard deviation	13.6	6.8	12	4.7	12.8	11.8	7.8	12.2	7.7	14.0	20.2	2.1	24.2
Variance	184	46.7	153	22.3	162	140	60.9	148	59.3	195	409	4.4	588
Skewness	2.6	1.2	4.1	1.8	1.7	1.7	2.5	6.5	2.8	1.8	1.7	9.3	1.4
Minimum	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	0.08	13
Maximum	101	32.0	148	34.0	78.0	74.0	42.0	109	54.0	132.0	182	38.0	210
Number of patients	392 <sup>1</sup> , 18 <sup>2</sup>	252	679	679	675	675	89	89	680	680	680	680	680
Percent of total patients processed	61	37	99.8	99.8	99.2	99.2	13	13	100	100	100	100	100

cal clinic involving 103 physicians-in-training and processing 60 to 80 patients per half-day session, the average total visit time was 149 minutes with more than half of that time spent waiting.<sup>7</sup> Another study performed in an outpatient department of a general hospital reported a mean waiting time of 126 minutes and a total mean time per visit of 226 minutes. In the same report a monetary value was determined for waiting time per patient based on the state per capita income (\$3,523) which resulted in \$4.79 per new patient visit and \$8.18 per return visit. In this facility patients were seen on a first-come, first-served basis. It was also noted that there was a 52 percent rate of missed appointments.<sup>8</sup>

Review of the literature reveals no report of patient attitude assessment as related to an office visit experience or related to time of waiting and

processing in particular. Perhaps the most revealing part of this study is the relatively high level of patient satisfaction with the office visits. Certainly more factors than time intervals of waiting and processing are involved in patient attitude. Other factors would be quite difficult to separate individually for study. The significant correlation of relatively negative attitudes with longer waiting times for the physician, total waiting time, and total visit time shown in this study indicates that these times do have an impact on patient attitude. However, based on the results of the graded attitude assessment used in this study, a negative deviation from the mean (five on a scale of six) could still be regarded as a generally positive attitude regardless of waiting time intervals.

The large number of patients failing to keep appointments or arriving late

Descriptive Statistic	Score of Scale of 1 to 6*
Mean	5.2
Standard deviation	1.0
Variance	1.0
Skewness	-1.2
Minimum	2.4
Maximum	6.0
Number	440

\* 6 = most positive response  
1 = most negative response



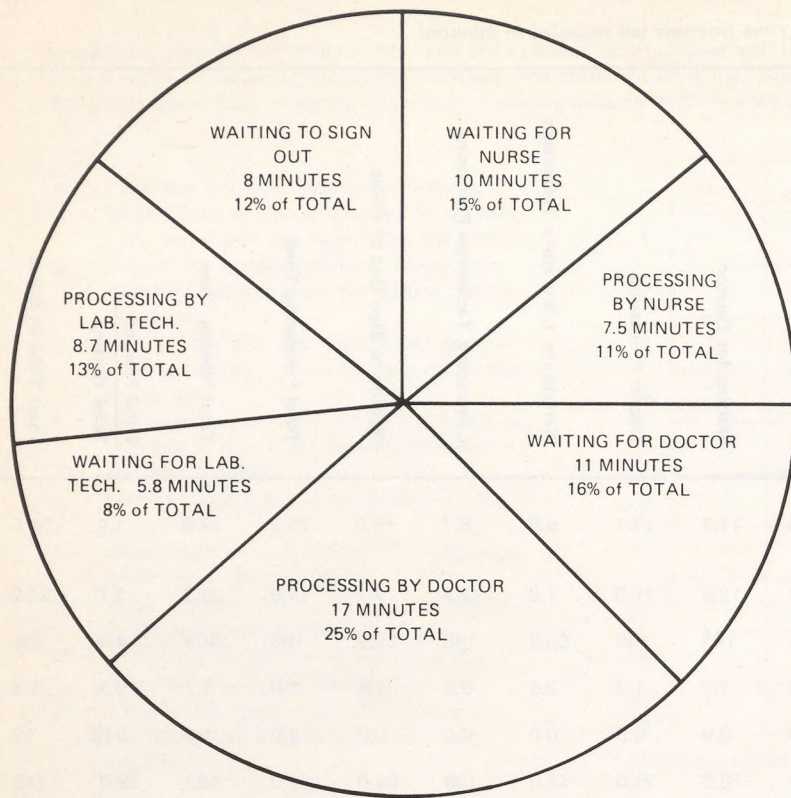


Figure 4. Distribution of Patient Time During an Average Office Visit, Total = 68 Minutes.

Table 4. Correlation of Time Intervals and Attitude

	Pearson Correlation Coefficients	Cases	Significance
Waiting for nurse	-0.0452	440	0.172 (NS)
Processing by nurse	0.0064	440	0.446 (NS)
Waiting for doctor	-0.1592	439	0.001 (S)*
Processing by doctor	-0.0247	439	0.303 (NS)
Waiting for laboratory technician	0.2034	57	0.065 (NS)
Processing by laboratory technician	-0.0782	57	0.281 (NS)
Waiting to sign out of clinic	0.0402	440	0.200 (NS)
Total processing time	-0.0209	440	0.331 (NS)
Total waiting time	-0.1002	440	0.018 (S)*
Total time in clinic	-0.0988	440	0.019 (S)*
Processing/waiting	0.0122	440	0.399 (NS)

\*A negative correlation coefficient implies that a longer time interval correlates with a more negative response.

must certainly affect efficient processing, both from the patient's and physician's viewpoint, but exactly to what extent was not studied. Perhaps this could best be studied by improving the two variables and repeating the study for conclusions.

Comparison of this Family Practice Model Office with other teaching model offices indicates that it processes patients as efficiently and in some instances more efficiently than others. Comparison with private office visits reveals longer times for the average patient visit to the Model Office. This difference is inevitable in a teaching Model which involves 12 physicians with varying experience and levels of training, limited personnel, and a rather cumbersome physical layout. This apparently does not adversely affect patient attitude in this Model Office but may have an effect on patients' selection of the Family Practice Model Office as their source of medical care. This possibility was not studied. The average patient attitude regarding his/her visit in the Model Office is highly positive though it is not certain whether this is because of efficient processing or the many other factors involved in outpatient care. However, as expected, longer waiting time is related to negative patient attitude and any changes in office organization designed to increase efficient use of physician time should not result in inefficient use of patient time.

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