

## CHAPTER IV

### RESEARCH FINDINGS AND DISCUSSION

The findings of this study are presented in two parts: the results of patient satisfaction questionnaire, and the results of hospital staff and leader interviews.

#### PATIENT SATISFACTION QUESTIONNAIRE RESULTS

##### *Description of Patient Sample*

A total sample of 710 out-patients was analyzed in the study. The subjects' demographic findings are presented in Table 4.1.

Table 4.1

#### Number and Percentages of Demographic Data

	Number	Percentage
<b>Sex</b>		
Male	343	47.7
Female	353	49.1
No response	14	3.2
<b>Age</b>		
15-24	187	26.3
25-34	181	25.5
35-44	122	17.2
45-54	113	15.9
55 and over	93	13.1
No response	14	2.0
<b>Marital Status</b>		
Married	493	69.4
Single	180	25.4
Divorced	16	2.3
No response	21	2.9

**Number and Percentages of Demographic Data  
(continued)**

	Number	Percentage
<b>Education</b>		
Primary	72	10.1
Middle	318	44.8
High	271	38.2
No response	49	6.9
<b>Occupation</b>		
Professional	360	50.7
Worker	160	22.5
Farmer	54	7.6
Business	14	2.0
Education	83	11.7
Other	16	2.3
No response	23	3.2
<b>Economic Status</b>		
< 100 Yun	41	5.7
101-150 Yun	178	25.1
151-200 Yun	207	29.2
> 200 Yun	206	29.0
No response	78	11.0

N = 710

Having described the personal characteristics of each sample, we then looked at the outpatient's experiences in attending the hospital. In asking the patients how they got to the hospital, we found that the majority of patients made their own way either by bicycle or bus (Table 4.2) and most of them (88.7 per cent) spent more than half an hour on the way to the OPD (Table 4.3).

Table 4.2

How Patient Got to Hospital		
Transportation	No.	%
Bicycle	326	46.4
Bus	228	32.4
Train	16	2.3
Foot	128	18.2
Other	5	0.7
Total	703	100.0

Table 4.3

Time Taken to Get to Hospital		
Time(m)	No.	%
< 10	79	11.3
11-30	228	32.5
31-60	188	26.8
> 61	206	29.4
Total	701	100.0

Patients had to make varied arrangements to attend the hospital (Table 4.4), and the majority of the arrangements of patients were for working. Table 4.5 shows that almost half of the subjects were accompanied by others to the hospital, and Table 4.6 reveals that 72 per cent of the sample were follow-up patients.

Table 4.4

## Patient Arrangements for Attending Hospital

Arrangements	NO.	%
Work	379	58.3
School	88	13.5
Baby Sitting	102	15.7
Loss of Earning	16	2.5
Other	65	10.0
TOTAL	650	100.0

Table 4.5

## Proportion of Patients Attending Hospital Alone or Accompanied by Others

	NO.	%
Alone	352	50.5
Accompanied	345	49.5
TOTAL	697	100.0

Table 4.6

## The Number of New and Follow-up Patient

	No.	%
New	197	28
Follow-up	508	72
Total	705	100

Information was collected on those who attended the out-patient department at any time during the previous three-month period. From Table 4.7, only 26 per cent of patients had in fact made one visit to hospital in period; a further 74 per cent had made more than two visits. The remaining, more than 20 per cent of patient, had averaged at least one visit every two weeks over the three-month period.

Table 4.7

**Number of Visits Patients Made to Hospital in a Three Month Period**

No. of Visits	No.	%
1	180	26
2	208	30
3	159	23
4-6	103	15
7 and over	42	6
Total	692	100

***The Patient Waiting Time at OPD***

The average waiting time of out-patients was 148 minutes. This ranged from 30 minutes to 4 hours. A total of 491 respondents (69 %) waited at the OPD for 2 hours or longer (Table 4.8). Table 4.9 contains the patient service category utilization at different departments. The average patient visited the OPD for a total 190 minutes. Direct contact with service providers occurred during 43 minutes of the typical patient's visit. Thus, overall efficiency in the OPD was only 22 percent as 78

percent of the patient's total visit time was waiting time. The length of the time were outstanding in Medical and Radiological Departments.

Table 4.8

Waiting Time at OPD		
Duration	No.	%
30m	42	5.9
31-60m	75	10.6
61-90m	102	14.4
91-120m	125	17.6
121-150m	193	27.2
151-180m	112	15.8
181-210m	19	2.7
211-240m	42	5.9
Total	710	100.0

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Table 4.9

## Patient Service Category Utilization

Patients Service Category	Patients Using Service(%)	Mean Service Time(m)	Mean Waiting Time(m)	Ratio of Service Time/ Total Time(%)*
Registration	99.0	3.20	12.21	20.77
Medical Dept.	98.6	10.36	52.36	16.51
Lab. Service	41.7	9.68	20.90	31.65
Radiological Service	23.0	13.41	42.27	24.08
Pharmacy	89.3	6.03	19.50	30.92
Overall	100.0	42.68	147.54	21.58

\* Service efficiency was calculated as follows:

$$\frac{\text{Average Service Time} \times 100 \%}{\text{Average Service Time} + \text{Average Waiting Time}}$$

It is indicated that almost all of the service categories had relatively low efficiency ratings. The Medical Department service however, was more significant than others. It should become the focus of additional analysis.

Figure 4.1 shows the average waiting time for the week (Monday to Saturday). Figure 4.2 presents the average total hours of patient waiting time over the day. Monday and Friday show the longest and shortest patient waiting time, respectively, and the waiting time for patient arrivals during 9-10 and 10-11 were longer than other hours.

Figure 4.1

Average Waiting Time for the Week

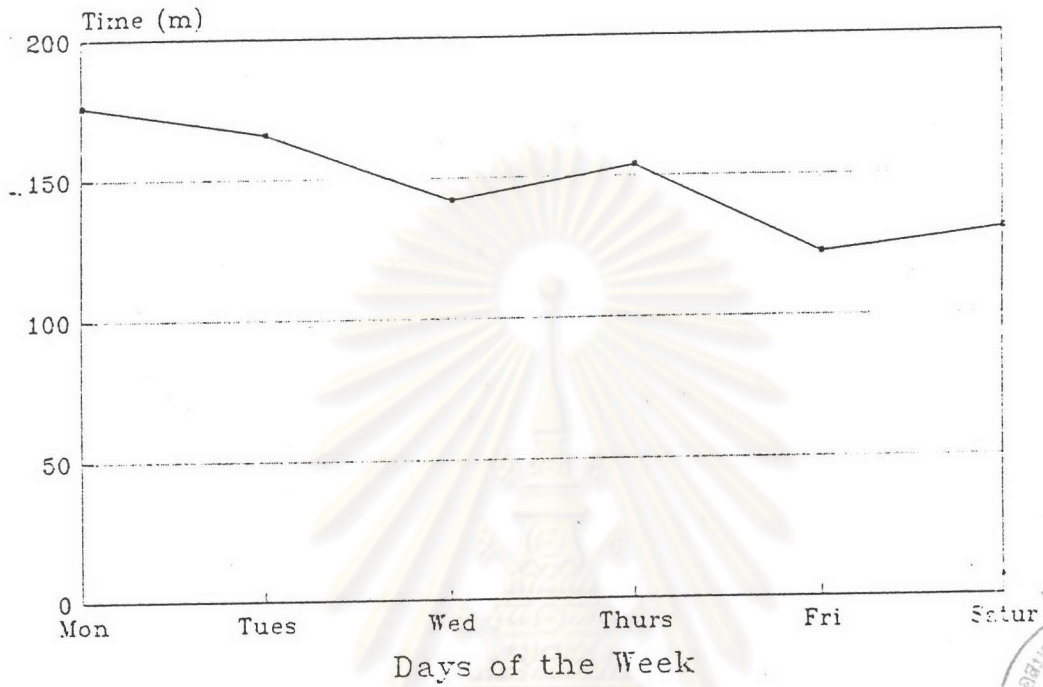
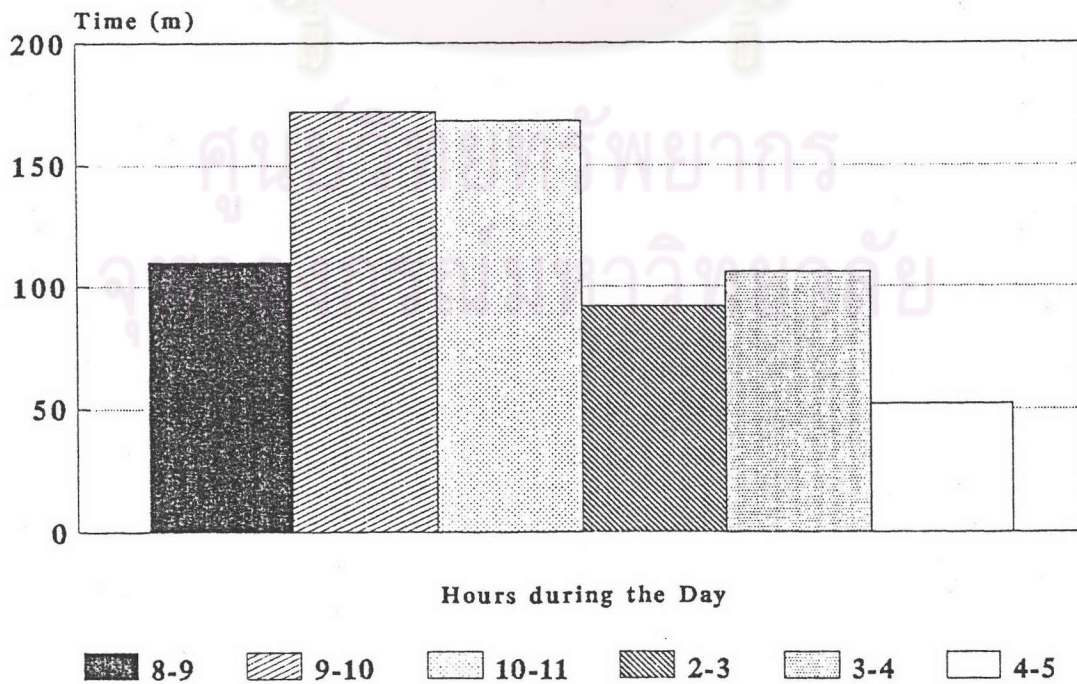


Figure 4.2

Average Total Hours Waiting Time over the Day





The patients were identified as either new patients or follow-up patients. Regarding length of waiting, the new patients and follow-up patients were general seen for more than 10 minutes in the clinic, while follow-up patients were usually seen for less (Table 4.10).

Table 4.10

**The Length of Wait and Consultation for  
New and Follow-up Patients**

Patient	Waiting(m)	Consultation(m)
New	149.7	15.3
Follow-up	147.5	8.1

Table 4.11

**How Long Patient Expected to Wait at OPD**

Time	NO.	%
about 0.5 hr.	21	3.0
about 1 hr.	395	56.4
about 2 hr.	221	31.6
about 3 hr.	53	7.7
TOTAL	690	100.0

Patient's expected time for the OPD was only 90 minutes (Table 4.11). As can be seen from Table 4.12, the proportion of dissatisfied patients increased in direct proportion to the length of wait. There was a substantial increase in the proportion regarding the wait as

unreasonable, for those who waited two hours or longer.

Table 4.12

**Proportion of Patients Who Felt the OPD  
Waiting Times Were Unreasonable**

Waiting Time	Patients' Opinions of Length of Wait			
	Unreasonable		Not Unreasonable	
	No.	%	No.	%
about 30 m	7	2.9	15	3.6
about 1 hr	21	8.6	97	23.7
about 1.5 hr	23	9.5	124	29.8
about 2 hr.	56	22.4	75	18.3
about 2.5 hr.	36	14.4	48	11.5
about 3 hr.	50	23.6	35	8.4
over 3 hr.	41	16.4	15	3.6
<b>Total</b>	<b>243</b>	<b>100.0</b>	<b>409</b>	<b>100.0</b>

***Relationship Between Patient and Medical Staff***

Table 4.13 shows that 41 per cent of the respondents stated that they felt dissatisfied with the medical staff they had met at the OPD (responses of 4 or 5) and 30.7 per cent thought that the medical staff were considerate, nice and helpful (responses of 1 or 2). Table 4.14 presents the means and standard deviations for the attitude scales measured in each of the study samples.

Table 4.13

Patient Attitudes to the Medical Staff					
Staff	Responses (%)				
	5	4	3	2	1
Doctors	4.5	29.9	25.2	35.9	4.5
Nurses	3.3	20.9	32.0	43.4	5.9
Lab.	5.8	29.6	24.8	30.4	3.7
Radi.	3.5	23.0	26.7	37.0	4.6
Phar.	4.2	28.8	30.3	36.6	3.4
Total	4.2	26.5	27.8	36.6	4.4

Table 4.14

Mean and Standard Deviations for Patients'  
Attitudes to Hospital Services

Sub-scale Scores	Sub-scale						
	GS	WT	DR	NU	RA	LT	PH
mean	2.921	2.916	3.113	2.896	2.916	2.935	3.004
SD	0.479	0.433	0.383	0.463	0.465	0.437	0.453
N	710	710	710	710	710	710	710

P < .01

GS = General Satisfaction  
 WT = Waiting Time  
 DR = Doctor  
 NU = Nurse  
 RA = Radiologist  
 LT = Lab. Technician  
 Ph = Pharmacist

Step-wise multiple regression was performed to assess the relative importance of each independent variable in determining patient general satisfaction with service. The association among the measures of satisfaction are show in Table 4.15. Statistically significant differences did exist between some variables and others. All correlation coefficients were positive and significant ( $P < .01$  or  $P < .05$ ). The strongest correlations among the measures of satisfaction were found between patient general satisfaction and satisfaction with waiting time and between satisfaction with nursing service. Therefore, waiting time and nursing service were the most important determinants in the evaluation of patient general satisfaction.

Table 4.15

**Multiple Regression of All Predictor Variables  
Influencing Patient General Satisfaction with Services**

Step	Variables	Multiple R	R <sup>2</sup>	R <sup>2</sup> Change	P
1	WT	.42885	.18392	.18392	.0000
2	Nu	.50391	.25393	.07001	.0000
3	Dr	.52935	.28021	.02628	.0000
4	Ra	.54409	.29604	.01583	.0014
5	Ph	.54844	.30479	.00884	.0009
6	Edu	.55416	.31205	.00726	.0248
7	Occu	.55782	.31844	.00639	.0291

Table 4.16

## Patient Opinions about the Services

	No.	%
Very Satisfied	110	16.0
Satisfied	353	51.0
Not Sure	40	5.8
Dissatisfied	129	18.6
Very dissatisfied	60	8.6
Total	693	100.0

Surprisingly, the patients in the sample expressed a high degree of overall satisfaction with the hospital services (Table 4.16). On the analysis of the survey results, an average of over 67 percent of patients declare themselves satisfied with the total services provided, and 61 percent of patients considered their wait in the department not unreasonable. We recognized that patients have low expectations of the service and strong feelings of gratitude. We hope to raise these expectation in the future. On the other hand, we have to be concerned that the medical staff might have provided "improved services" to the patients during the period of data collection. It might affect the patient opinions of the hospital services.

#### MEDICAL STAFF AND LEADER INTERVIEW RESULTS

Most of interviewed medical staff and hospital leaders were not hesitant to talk. Several problems were consistently mentioned by them. Almost all of them considered that the long waiting time and patient

dissatisfaction with the service existed at the OPD. However, foremost issues were concerns about the hospital's personnel, finance, information systems, and its strategies and autonomy as a university hospital. The perceptions of interviewees were documented and interpreted by the researcher. Overall, the interview results reflected the key ideas of the interviewees correctly.

### *The Factors Which May Affect Patient Satisfaction with Service*

The factors which may affect patient satisfaction with services in this study were identified from the assessment of the strategic issues facing the hospital. It was apparent that most of the factors were identified from the environment assessment. A number of models were used, for example, SWOT analysis which looked at the strengths, weaknesses, opportunities and threats of the hospital. Assessing the internal environment means to identify internal strengths and weaknesses from the three main categories: input (resources), process (present strategy), and output (performance). PEST analysis considered political, economic, social and technological factors in the external environment that have a major impact on the functioning of the hospital.

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External environment factors affecting patient satisfaction with service in the hospital is summarized below:

#### External Environment Assessment

Factors	Findings	
	Opportunities	Threats
Political	- A promotion of national health policy involved in the hospital	- Lack of decision-making power - Personnel system
Economic		- Lack of budget
Social	- Good image - Cost awareness	- Number of population - Illness trends
Technology	- Advances in medical technology - Medical research - Implementation of technology	- Lack of computerisation

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Internal environment factors affecting patient satisfaction with service in the hospital is summarized below:

<b>Internal Environment Assessment</b>		
Factors	Findings	
	Strengths	Weaknesses
Resources (Input) Staff	- High quality health personnel	- Lack of medical staff - Over clinical workload - Few opportunities for special training - Lack of motivation and reward
Economic	- Cost awareness	- Finance allocation
Information		- Inadequate 'MIS'
Present Strategies (Process) Overall		- No development strategy
Performance (Output)		- Lack of meaningful measures of outcome

### *The Strategic Issues for Improving Patient Waiting Time and Satisfaction with Service*

The findings of this study indicated that the inherent variability in out-patient waiting time and satisfaction with services creates a challenge for hospital managers trying to identify strategic issues. From 1981 to 1990 in this hospital, the number of out-patient visits per year



increased approximately 18 per cent. More importantly, however, the staff capability became more diversified. Staff had disproportionately increased in number to serve the rapidly-expanding out-patient population and to perform additional research and teaching activities. From this study, we found that the longest waiting time occurred for out-patients was for a seeing doctor. So the focus of our strategies should be on how to improve the waiting time and satisfaction with services at the medical department. Consequently, the waiting time should be improved at other departments, and the whole visiting time at the OPD and the satisfaction with service should improve as well. On the other hand, we have to consider the strategic issues to satisfy the three stakeholders: patients, staff and the hospital. In the study, rather than increase the hospital resource base, a balanced set of relevant, low-cost strategies were proposed to improve performance. These strategies involved changing internal operations to maintain or increase the level of production with fewer resources. They also introduced a number of initiatives in new areas which were designed to solve problems that had concerned the hospital in the past but had not always been given first priority concerning in waiting time and satisfaction with service. These addressed from two perspectives. One approach focused on smoothing patient demand for services. The second approach applied managerial control by matching the supply of services to the existing pattern of demand.

The demand and supply framework associated with a set of strategic issues for improving patient waiting time and satisfaction with service is illustrated in Figure 4.3.

Figure 4.3

## The Strategic Issues



## Demand-Smoothing Strategies

Smoothing the demand for services involves redirecting patient arrivals to coincide with the organization's planned processing.

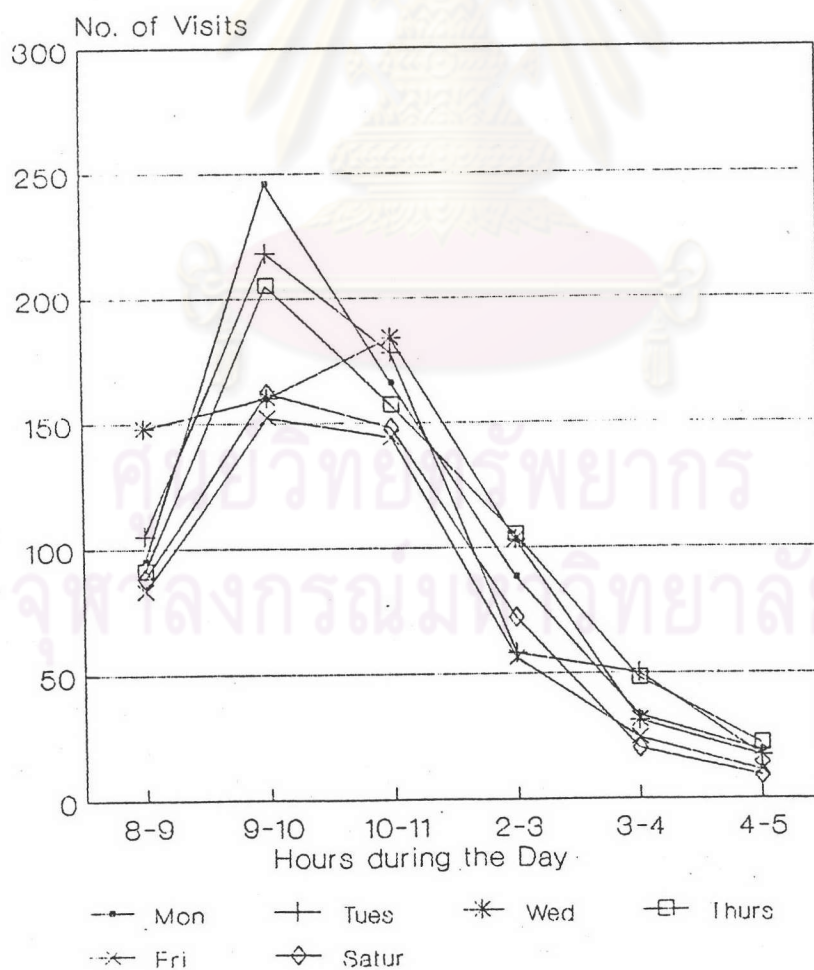
1. Scheduling system for appointment patients and forecasting system for walk-in patients

A scheduling system for appointment patients to regulate the arrival of known patients through an appointment system is commonly used strategy. Forecasting unscheduled demands for service through a time series analysis of walk-in patients' arrival dates and times can improve

the effectiveness of any appointment system by making the arrival rate more uniform. Because of the rapid growth of the outpatient clinic and a lack of adequate support, the appointment system became the focus of attention in this hospital. From the historical data it was estimated that there were, on the average, 680 physician visits per day and 4,080 per week at the medical department. Figure 4.4 shows these peak-load situations at the department during the week when data was collected in this study.

Figure 4.4

Patient Arrival Distribution at Medical Dept.  
Day of Week / Time of Day



The largest number of arrivals occurred on Monday, with Tuesday a close second. The smallest numbers occurred on Friday. The heaviest patient service during the day occurred at 9-11am. The situation was worsened by the fact that the heaviest patient load occurred during the lunch hours when these three areas (radiology, laboratory and pharmacy) are often short of personnel (Figure 4.2). Consequently, those who arrived at the OPD during 9-11am had to spend a longer time at the hospital. One possible solution for this situation is to offer more or other patient services on Friday, or afternoon in order to make use of the existing resources namely available ancillary staff members. For example, patients who arrived with simple needs could be served by employing a "shortest processing time" rule. Another effective strategy could be to assign such demand to times and days when congestion is not a concern, such as Friday or Saturday afternoons.

On the other hand, if we have an appointment system for the patients, it could benefit the follow-up patients very much. Most of those who came to this hospital were follow-up patients. If we can cut down the waiting time for follow-up patients then the whole waiting time at the OPD would be shortened.

Adjusting the number of scheduled appointments by time-of-day and day-of-week could reflect the number of anticipated walk-in patients. Implementing an appointment scheduling system that reflects this distribution of patient demand would help reduce patient congestion for both appointment patients and walk-in patients.

## 2. Health Program Coordination

The strategy of health program coordination aims to decrease the number of patients added to this hospital by promoting primary care in general practice or cooperating with local hospitals, and so on.

Illustrative classification of different types of health systems would be useful. Comparatively speaking, a large number of patients attend to teaching hospitals even though the patients could have been treated in the district level health system. From our survey, the percentage of follow-up patients attending this hospital was very high (72%). We should have well-coordinated hospital and community care, so that we can balance patient flow to avoid overloading clinic units in university hospitals. We should develop a strategy which would lead to reductions in waiting time, which would reduce the number of patients added to the university hospital as well. Managers need to harness good ideas coming from general practice and primary care teams for the solution of waiting time problem. More local services can reduce or eliminate the need for patients to attend teaching hospital for diagnosis and/or treatment, and reduce the rate of referral from primary to secondary care. Therefore, more changes will take place in primary care arena with regard to waiting time. We must address the need for the development of more effective communication between the university hospital and primary care practice staff. This development should include hospital professionals working with the primary care team to train and educate the staff to improve general practice. Further developments should, however, also include an evaluation system to measure the quality of treatment and benefits in local hospitals.

On the other hand, although the primary focus in a clinical setting is to respond to the patient problems, managers should not overlook opportunities to offer additional services to patients or those who accompany them. These services might include health education or instruction in home-care routines for the patients' families, or wellness promotions designed to use hospital services at different health care levels which occupying waiting patients. Informing patients in person, by videotape, or in writing could increase motivation and provide necessary

information. The focus of promotion should be on helping patients to get the most out of their experiences, which also contributes most to the hospital. Such education can have additional advantages in promoting satisfaction, too.

### 3. Differential Pricing

Another strategy used to smooth demand is differential pricing. Price incentives that decrease charges for services rendered during periods of low utilization can help access latent demand, as well as redistribute peak demand. The administration of school physicians is an example of services that could be discounted when provide at an off-peak time. Competitive pricing for certain services delivered at selected time periods during the day or the week helps reduce patient congestion and convert idle clinic capacity to productive use.

## Supply-Matching Strategies

### 1. Staff Scheduling

The most common strategy for adjusting service supply to accommodate existing demand is effective staff scheduling. Having an adequate number of staff available at all times can greatly improve productivity and lower operation costs. This practice is, of course, dependent upon an ability to anticipate demand and obtain the services of qualified personnel. For the out-patient department, available patient service resources do appear to impede performance. The supply of resources is not perfectly matched with the demand for services (Table 4.17).



Table 4.17

Patient Visits:Medical Staff Ratios			
Departments	Visits	Staff	Ratio
Medicine	700	12	1: 60
Laboratory	300	6	1: 50
Radiology	120	6	1: 20
Pharmacy	640	4	1:160

This is a clear indication of an overcrowded list and the solution may be to try to reduce the number of patients per clinic or to hold additional clinics in the peak-load situation (Seamus M. and Jone M., 1991). Staggered work shift hours can be an effective means for matching staffing needs to forecasted variations in service demand. It can provide knowledgeable staff to "float" from other clinics within the facility during times of heavy patient service demand. In the other words, a redistribution of medical staff time within the out-patient department would result in greater effectiveness of medical staff, and a subsequent reduction in patient waiting time and an increase in patient satisfaction with services.

## 2. The Use of Paraprofessional Staff

Another strategy designed to improve physician productivity is the use of more allied health professionals. It can be assumed that they could be responsible for the routine aspects of care at lower cost than if the same services were provided by a physician.

In this study, physicians were asked to estimate the time they spent in various activities for the day. Most of them mentioned that too

much time was spent in activities which should be done by physician's assistants, or nurses aides, such as measuring blood pressure, waiting for patients' suggestions, and so on. Paraprofessional staff could be used to see primary care ambulatory patients. As clinical size increases, there seems to be a reduction in physicians. An increase in paraprofessional staff may improve patient waiting time and satisfaction with services, as well as help match fluctuating service demand with the available service capacity.

### 3. Patient Participation

A final supply-side strategy involves participation on the health care consumer's part. Identifying and assigning tasks that the patient is capable of performing allows provider personnel to use their specialized skills more fully while providing a constructive diversion for the waiting patient. Such tasks as completing patient history forms and conveying laboratory samples and patient records illustrate this strategy. Probably the most frequently cited benefit of patient participation is its contribution to patient satisfaction. Other service industries have demonstrated how customer behavior promotes satisfaction. Having something to do while waiting for services both makes the wait seem shorter and promotes the sense that services has already begun. Patients who participate in addressing their own needs report higher satisfaction (Wallace C. 1986). Patient involvement in the completion of diagnostic or therapeutic tasks related to service delivery often can release providers to fulfill their other specialized responsibilities.