AN ANALYSIS OF THE MECHANIZED CENTRAL APPOINTMENT SYSTEM AT FITZSIMONS GENERAL HOSPITAL DENVER, COLORADO

A Problem Solving Thesis

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By

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INTRODUCTION

Health care delivery through the years has been focused on inpatient rather than outpatient care. In the last decade, this tradition has begun to change for several reasons--such as, improper utilization of personnel and facilities, and the high cost of inpatient care.

The changing concept for the proper delivery of health care is slanted away from an over-utilization of hospital beds; and shifted toward care and treatment of patients in outpatient facilities, or in some cases, such as that of the elderly patient, in the home. These methods enable the patient to care for himself or to receive care in his own environment.

This changing and more prominent role for outpatient facilities throughout this country has carried with it a tide of complaints concerning outpatient service. Perhaps the most widely aired complaint is one of long waiting lines. Many patients wait as long as an entire eight-hour work day to see a physician for five or ten minutes. Preceding this wait, the patient may have had a three to six month wait in order to secure an appointment.

With this increasing demand for outpatient care there must be emphasis placed on developing a more efficient and

effective system of outpatient service that responds to the needs of the patient. Perhaps a good starting place would be an investigation of the scheduling of resources and facilities. Methods must be devised whereby patients are scheduled in a way that is both beneficial to their care and allows the physician sufficient time to render his services in an optimum manner.

Hospital History and Setting

On October 13, 1918, Lieutenant Colonel William P. Harlow became the first hospital commander of a medical facility designated as United States Army Hospital No. 21. This medical facility contained forty-eight structures, some of which included a central infirmary for 300 bed patients, twelve two-story tuberculosis wards, one isolation ward, and administrative facilities. The total completion cost of the hospital was 1.3 million dollars. On July 1, 1920, the hospital was renamed Fitzsimons General Hospital in honor and memory of 1st Lieutenant William Thomas Fitzsimons of Burlington, Kansas, an Army physician who was killed as a result of enemy action in World War I.

Today, in sharp contrast with the past, the Fitzsimons General Hospital complex is dominated by a nine-floor main hospital building which is surrounded by over 200 outlying buildings and is encircled by the city of Denver, Colorado, a most prosperous and growing metropolitan area. Fitzsimons offers care and treatment in virtually all medical and surgical specialties. Fitzsimons is also designated as a

world-wide treatment center for the following specialty areas:

Medicine: General, Tuberculosis, Dermatology and Neurology.

Surgery: General, Orthopedic, Thoracic, Cardiac, Neurosurgery, Otolaryngology, Opthalmology, Plastic, Hand and Amputee.

Neuropsychiatry: Closed and Open Ward.

Radiology: Radioisotope, Deep X-ray and Radium.

A total of 1,730 beds are available for hospital patients and the average census is approximately 1,300. There is an average outpatient workload of 48,000 patient visits per month. The fiscal year budget is approximately 26 million dollars (including military and civilian payrolls). The hospital employs approximately 1,400 civilians and 1,200 military personnel. There are about 150 physicians and 216 registered nurses on the professional staff.

Fitzsimons General Hospital also has a secondary mission of conducting a medical education program. Fitzsimons is one of the Army's most important teaching hospitals. Over 100 physicians are currently receiving intern and residency training in several major specialties. (see Appendix A).

Conditions Prompting the Study

An increased workload, due to expansion, has resulted in undue stress on personnel and present equipment in the Central Appointment Section.

Statement of the Problem

The problem is to determine the most effective method of improving the mechanized Central Appointment System (CAS) at Fitzsimons General Hospital, Denver, Colorado.

Definition of Terms

Automatic call distribution system--Incoming telephone calls into a centralized appointment system which are automatically routed to the first available appointment clerk.

Block system--Groups of patients given appointments at the same time, usually at the beginning of a clinic session.

Centralized appointment system--Appointments for all clinics are made from one location.

Decentralized appointment system--Each clinic makes their own appointments.

Mechanized central appointment system--The utilization of data processing procedures to manipulate punch cards for utilization within the system and as by-products of the system.

Totally automated central appointment system--A completely computerized system of centralized appointments which, through teletypes, can essentially make, cancel, and print out appointment schedules very rapidly.

Review of the Literature

Virtually all current literature concerned with outpatient scheduling decries the long lines and even longer waiting periods which plague outpatient clinics. The block appointment system utilized in many clinics today has resulted in little concern for the patient's time, but has placed an emphasis on efficient use of the physician's time.

Scott and Volkart[1] reveal an interesting aspect of the influence among physicians in outpatient clinics. They state that physicians label patient scheduling as "just administrative paperwork." Physicians in clinics generally do not see all the patients scheduled for them nor do they routinely arrive on time for their clinics. This appears to be an overt display of disdain for any regulatory system which structures their practice of medicine. Perhaps what is needed first, then, is to prove the merits of a good scheduling system to the physicians who must work within the constraints of that system. The method which has been most successful thus far is placing a professional supervisor (who is well qualified, respected, and sometimes feared by his subordinates) in charge of the clinics. When a man of this caliber expounds on the merits of proper patient scheduling, less disdain for administration does not always result, but, this method has resulted in compliance by the physicians with the policies and procedures the supervisor has imposed.

What is needed is a system which will schedule patients close enough together to preclude wasting the clinician's time, but, on the other hand, spread out enough to preclude the waste of the patient's time. To obtain such a system is certainly the goal in scheduling patient appointments. What magnifies the problems in attaining this goal is an ever-increasing volume of patients entering outpatient facilities. In one decade (1960-1970) the number of admissions in the United States has risen from over 25 million to almost 31 million or a 22.8 per cent increase while the outpatient visits have soared from over 99 million to over 163 million or a 64.3 per cent increase.[2] These figures vividly reveal the shift from inpatient to outpatient care.

Medical facilities have begun to take positive steps toward meeting the challenges of scheduling outpatient appointments. Ohio State University has converted from a manual system of appointments to an automatic data processing system of scheduling patient appointments. This conversion has resulted in a low-cost, effective system which can be adapted to transmitting data electronically from one facility to another.[3]

The Group Health Cooperative at Puget Sound, a prepaid group practice with a membership of 112,000 was receiving telephone busy signals at the rate of 2,000 per week. This rate, of course was unacceptable, so plans were reviewed and approved for the installation of a new 15-position centralized

appointment system. This system contains an automatic call distribution system which allows calls to be distributed among the thirteen telephone appointment clerks on a first-come, first-served basis. This system has resulted in as little as eight busy signals a week and numerous other labor and cost-saving features.[4]

An even more sophisticated and much more expensive system was installed at Children's Hospital Medical Center in Boston. This hospital has a totally computerized outpatient scheduling system which was made possible by a United States Public Health Service grant of $668,621. With fantastic speed the computer is able to store all the up-to-date information an appointment clerk needs for scheduling. The use of twelve cathode ray tube terminals makes this information immediately available throughout the clinic building. All a clerk has to do is press a "command" button on the cathode ray tube unit, and within seconds the unit displays the open appointments by date and time. The clerk simply pushes the buttons indicating the date and time desired by the patient, and the appointment is made.[5]

The Peter Bent Brigham Hospital, also in Boston, found its manual system outdated and completely outmoded in meeting the demands of 55,000 patient visits per year. They totally computerized their system, using the computer services of Keydata Corporation, and this changeover has resulted in the elimination of many problems common to most appointment systems.

It must be stated, however, that the cost involved in installing such a system would presently be prohibitive in most medical facilities.[6]

It is obvious that there is a definite need to improve the patient appointment scheduling within hospitals. As in most problem-solving situations, the solution cannot be applied to the general state of affairs; but rather must be geared toward the particular area of study. One can, however, generally state that an effective appointment system should efficiently perform these functions enumerated by Bennett:[7] (1) controlling input; (2) controlling flow within the system; (3) providing over-all scheduling; (4) providing coordination; (5) providing communication; and (6) providing over-all information.

The main goal in designing such a system should simply be the optimum utilization of time for both the patient and the physician which results in more effective care and service to the patient.

Problem-Solving Methodology

Current literature was read and studied with the purpose of gleaning new and better ideas and methods for improvement of the present system.

The system as a whole (see Appendix B) was analyzed prior to evaluating the system components, and a Flow Chart was constructed (see Appendix C).

Interviews were conducted with administrators, physicians,

and patients in an attempt to ascertain if the central appointment system was responsive to their needs, and, if so, would it be responsive with expansion.

The author actually worked as a telephone appointment clerk in the central appointment system in order to gain a working knowledge of the system and to obtain an appreciation of the problems and tasks involved in scheduling appointments. This method provided daily communication with the appointment clerks which resulted in the gathering of the pertinent ground level information about the system.

Over 180 telephone calls were made into the central appointment system over an eight-day period. The purpose of these calls was to determine the waiting time involved, once connected into the system; and the number of times the lines were busy. These calls were initiated through on-post, off-post, and direct (in-hospital) lines.

Phone calls were monitored by the author, while working in the appointment system, to determine the number of patients waiting to be served and to tabulate the period of time involved in making appointments. The number of patients waiting to be served can be ascertained by the number of blinking light buttons on the phone panel.

Pertinent outpatient and central appointment system workload data was studied and recorded in order to portray a growth trend.

A personal visit was made to Denver General Hospital where a new computer system had just been installed. A briefing was conducted on the use of this highly sophisticated computer system in scheduling patient appointments.

Footnotes

[1]Richard W. Scott and Edmund H. Volkart, Medical Care (New York: John Wiley and Sons, Inc., 1966), pp. 432-436.

[2]"Hospital Statistics," Hospitals: Guide Issue, XLIV (August 1, 1970), 463.

[3]John H. Bergman and David L. Steffey, "Data Processing Improves Outpatient Management," Hospitals, XLIII (January 1, 1969), 49-51.

[4]Michael B. Mitchell, "Appointment Scheduling," Hospitals, XLIV (June 1, 1970), 58-59.

[5]Leonard W. Cronkhite, "Computer Brings Order to Clinic Scheduling System, "Hospitals, XLIII (April 16, 1969), 55-57.

[6]Andrew G. Jesseman and Kathryn Erat, "Automated Appointment System to Facilitate Medical-Care Management," Medical Care, VIII (May-June, 1970), 234-246.

[7]Addison C. Bennett, "Systems Approach to Improvement," Hospital Topics, XLVIII (June, 1970), 48-52.

CHAPTER II

DISCUSSION

Background and Development of the Present System

Outpatient clinic visits at Fitzsimons General Hospital have been increasing markedly each year since World War II, and as in civilian hospitals throughout the United States, this trend seems likely to continue.

In 1963 outpatient clinic visits were approximately 400,000. The need for a better system of scheduling appointments, compiling clinic statistics, and increasing the availability of outpatient records was recognized, and action was initiated to install a mechanized central appointment system.

Initially, personnel who had been working in the old block appointment system were resistant to the proposed change. As in any change which involves improvement through technology, there is a resistance which stems mainly from loss of job or control. However, strong leadership overcame this obstacle, and the central appointment system was officially begun in June, 1963. Soon after this initial breakthrough, ten other major clinics were phased into the system on a voluntary basis.

Since those early years of the system, clinic visits have

continued to increase (see Appendix D) along with the central appointment system expansion. Currently, there are approximately forty major and sub clinics scheduling appointments under the central appointment system (see Appendix E). During calendar year 1970 over 180,000 phone calls were received in the system. Of these, 96,361 were for appointments, and the remaining calls were patient requests for general information. In addition, over 808,000 appointment cards were punched for processing (see Appendix F).

Objectives of the System

The primary objective of the system is to maximize the utilization of available medical and administrative manpower. Medically, the system is concerned with scheduling patients with predetermined physicians; administratively, the system is concerned with consolidating similar clerical functions into a central appointment system in order to reduce the clerical duties in other clinics.

In addition to these primary objectives, the central appointment system is also used to facilitate the collection, reduction, and presentation of required statistical data and to assist in the control and distribution of medical records.

Current Procedures

The operating procedures of the current system are simple, and they are efficiently organized. First, the department chief of each clinic determines the capabilities of receiving

patients and lists by name each physician who will be available to receive patients at certain dates and times. This information is forwarded to the central appointment system on a "master sheet," the document which actually activates the appointment system procedures. Each clinic also decides the interval of time to be allotted to specific types of cases and how far in advance appointments can be made.

The information contained on the master sheet is then forwarded to the data processing branch along with the master cards. Data processing branch then produces prepunched appointment record cards for each physician by clinic. This card contains the appointment time, day, date, month, physician code number, and clinic code as seen in figure 1 on page 15.

After this process has been completed, the cards are returned to the central appointment section for filing in the rotary file where open appointments are stored. The period of time for this storage is as specified by each clinic chief. Normally, this period ranges from twenty-four hours to two months in advance. Within this rotary file, the open appointments are filed by clinic and by physician within the clinic.

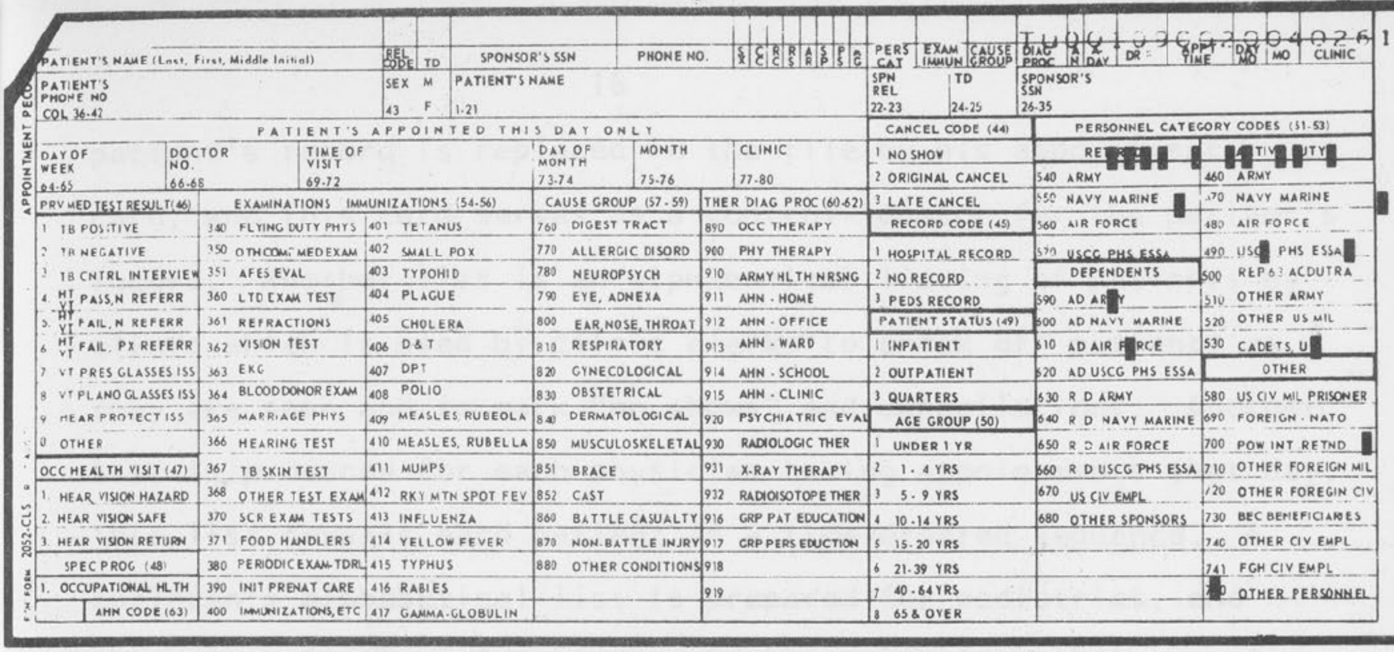
Virtually all appointments are made by telephone, either from the patient's home (on-post or off-post) or from any of three locations within the hospital: the lobby adjacent to the outpatient clinic, first floor east near the medical clinic, or the fifth floor near the orthopedic, surgical, and podiatry clinics.

When a call is placed into the system, it is received by a specially qualified telephone appointment clerk. The patient requests an appointment in a specific clinic. The clerk then pushes a botton to the left on his desk which activates the rotation wheel that holds the appointment cards (see Appendix G). When the specific clinic is located, the clerk asks the patient which doctor and date/time period is preferred. In most instances the patient is able to obtain an appointment with the physician he chooses, and at a date and time acceptable to him. Then the clerk encircles and writes on the appointment card the necessary information as seen in figure 2, page 15.

After the clerk completes these cards, they are placed in a small open file to the right side of the clerk's desk. These cards are then ready to be punched and are picked up by a key-punch operator at regular intervals during the day.

Now the card is coded by the key-punch operator, verified by another operator, and then filed in the closed appointment file. A sample of the completed appointment card is shown in figure 3, page 15.

Two days prior to the scheduled appointments, all applicable cards are forwarded to data processing where five lists are prepared. One list is terminal digit listing of patients which is sent to the central outpatient record section. Based on this list, all patient's records are pulled and forwarded to the appropriate clinic for the next day's appointments. The



PATIENT'S NAME (Last, First, Middle Initial) | REL CODE | TD | SPONSOR'S SSN | PHONE NO. | PERS CAT | EXAM IMMUN | CAUSE GROUP | DIAG PROC | DR | APPT TIME | DAY MO | MO | CLINIC

PATIENT'S PHONE NO COL 36-42 | SEX M F 43 | PATIENT'S NAME 1-21 | SPN REL 22-23 | TD 24-25 | SPONSOR'S SSN 26-35

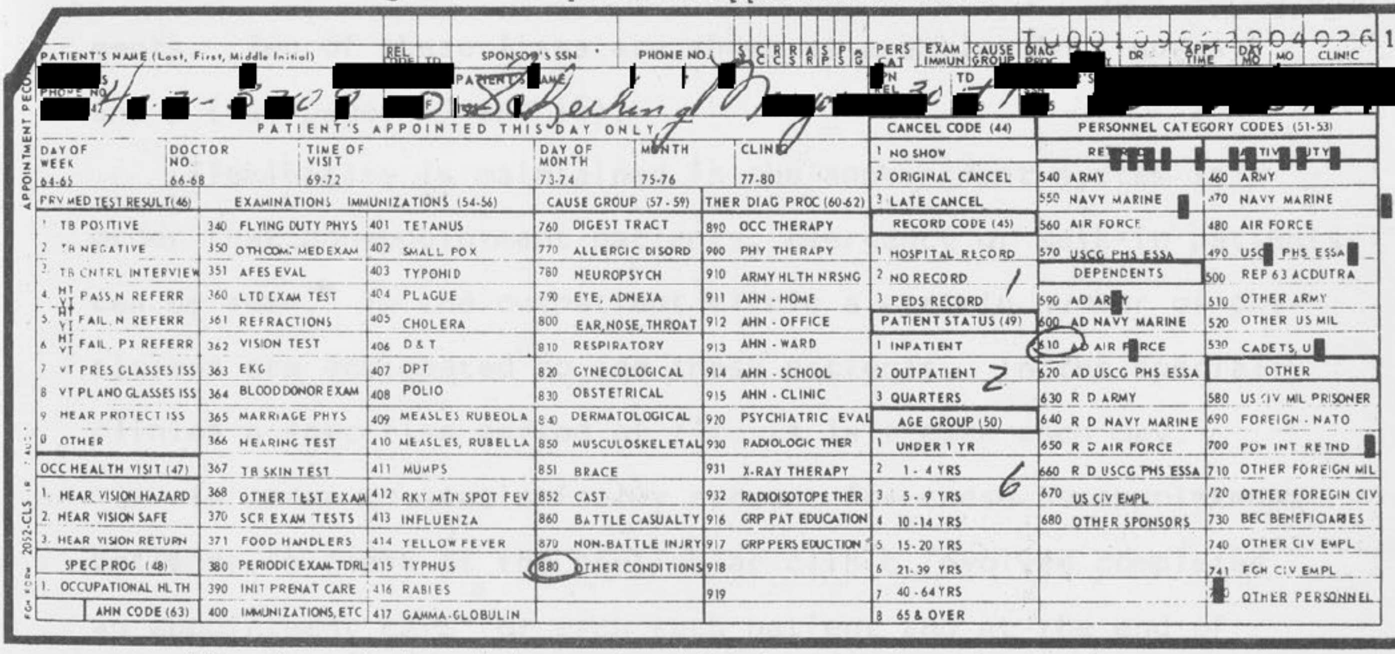
PATIENT'S APPOINTED THIS DAY ONLY

DAY OF WEEK 64-65 | DOCTOR NO. 66-68 | TIME OF VISIT 69-72 | DAY OF MONTH 73-74 | MONTH 75-76 | CLINIC 77-80

PRV MED TEST RESULT (46)	EXAMINATIONS	IMMUNIZATIONS (54-56)	CAUSE GROUP (57-59)	THER DIAG PROC (60-62)	CANCEL CODE (44)	PERSONNEL CATEGORY CODES (51-53)	
1 TB POSITIVE	340 FLYING DUTY PHYS	401 TETANUS	760 DIGEST TRACT	890 OCC THERAPY	1 NO SHOW	RETIRED	ACTIVE DUTY
2 TB NEGATIVE	350 OTH COM MED EXAM	402 SMALL POX	770 ALLERGIC DISORD	900 PHY THERAPY	2 ORIGINAL CANCEL	540 ARMY	460 ARMY
3 TB CNTRL INTERVIEW	351 AFES EVAL	403 TYPOHID	780 NEUROPSYCH	910 ARMY HLTH NRSNG	3 LATE CANCEL	550 NAVY MARINE	470 NAVY MARINE
4 HT VT PASS, N REFERR	360 LTD EXAM TEST	404 PLAGUE	790 EYE, ADNEXA	911 AHN - HOME	RECORD CODE (45)	560 AIR FORCE	480 AIR FORCE
5 HT VT FAIL, N REFERR	361 REFRACTIONS	405 CHOLERA	800 EAR, NOSE, THROAT	912 AHN - OFFICE	1 HOSPITAL RECORD	570 USCG PHS ESSA	490 USCG PHS ESSA
6 HT VT FAIL, PX REFERR	362 VISION TEST	406 D & T	810 RESPIRATORY	913 AHN - WARD	2 NO RECORD	DEPENDENTS	500 REP 63 ACDUTRA
7 VT PRES GLASSES ISS	363 EKG	407 DPT	820 GYNECOLOGICAL	914 AHN - SCHOOL	3 PEDS RECORD	590 AD ARMY	510 OTHER ARMY
8 VT PLANO GLASSES ISS	364 BLOOD DONOR EXAM	408 POLIO	830 OBSTETRICAL	915 AHN - CLINIC	PATIENT STATUS (49)	600 AD NAVY MARINE	520 OTHER US MIL
9 HEAR PROTECT ISS	365 MARRIAGE PHYS	409 MEASLES RUBEOLA	840 DERMATOLOGICAL	920 PSYCHIATRIC EVAL	1 INPATIENT	610 AD AIR FORCE	530 CADETS, U
0 OTHER	366 HEARING TEST	410 MEASLES, RUBELLA	850 MUSCULOSKELETAL	930 RADIOLOGIC THER	2 OUTPATIENT	620 AD USCG PHS ESSA	OTHER
OCC HEALTH VISIT (47)	367 TB SKIN TEST	411 MUMPS	851 BRACE	931 X-RAY THERAPY	3 QUARTERS	630 R D ARMY	580 US CIV MIL PRISONER
1 HEAR VISION HAZARD	368 OTHER TEST EXAM	412 RKY MTN SPOT FEV	852 CAST	932 RADIOISOTOPE THER	AGE GROUP (50)	640 R D NAVY MARINE	690 FOREIGN - NATO
2 HEAR VISION SAFE	370 SCR EXAM TESTS	413 INFLUENZA	860 BATTLE CASUALTY	916 GRP PAT EDUCATION	1 UNDER 1 YR	650 R D AIR FORCE	700 POW INT RETND
3 HEAR VISION RETURN	371 FOOD HANDLERS	414 YELLOW FEVER	870 NON-BATTLE INJRY	917 GRP PERS EDUCTION	2 1 - 4 YRS	660 R D USCG PHS ESSA	710 OTHER FOREIGN MIL
SPEC PROG (48)	380 PERIODIC EXAM-TDRL	415 TYPHUS	880 OTHER CONDITIONS	918	3 5 - 9 YRS	670 US CIV EMPL	720 OTHER FOREGIN CIV
1 OCCUPATIONAL HLTH	390 INIT PRENAT CARE	416 RABIES		919	4 10 - 14 YRS	680 OTHER SPONSORS	730 BEC BENEFICIARIES
AHN CODE (63)	400 IMMUNIZATIONS, ETC	417 GAMMA-GLOBULIN			5 15 - 20 YRS		740 OTHER CIV EMPL
					6 21 - 39 YRS		741 FGH CIV EMPL
					7 40 - 64 YRS		750 OTHER PERSONNEL
					8 65 & OVER		

FGH FORM 2052-CLS

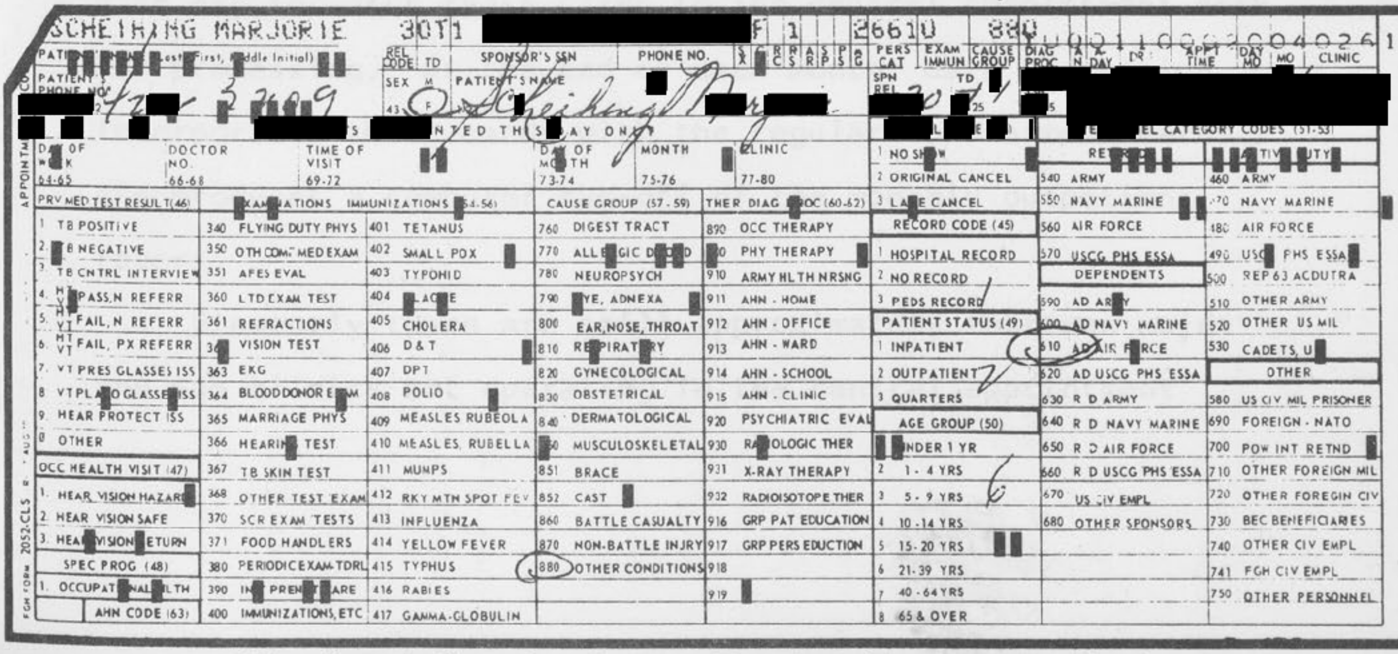
Fig. 1. --Prepunched Appointment Card



[redacted] 4 [redacted] 3209 [redacted] Scheiking Marj[redacted] 30 [redacted]

(Same printed card as Fig. 1, with handwritten entries: 1 beside NO RECORD; 610 AD AIR FORCE circled; 2 beside OUTPATIENT; 6 beside AGE GROUP; 880 OTHER CONDITIONS circled.)

Fig. 2. --Patient Information Added to the Card by the Clerk



SCHEIKING MARJORIE 30T1 [redacted] F 1 2661U 880

[redacted] 4 [redacted] 3209 [redacted] Scheiking Marj[redacted] 30 [redacted]

(Same card as Fig. 2, with key-punch holes.)

Fig. 3. --A Completed, Key-Punched Appointment Card

patient's record is replaced in the file by his appointment card, and this card serves as a control-locator for the patient's record. Another list is an alphabetical listing of patients by clinic which is used by clinic clerks to check off patients as they are seen and to mark "no shows" and cancellations. Another list is produced for each physician taking appointments that day. This list reveals each patient in a time-ordered sequence. A children's alphabetical list is prepared for pediatrics, and there is a listing of patients who have cancelled their appointments. Two of these lists are shown as examples in figures 4 and 5 (See pages 17 and 18).

Flexibility is maintained in the appointment system in order that nonappointment patients, emergency or walk-in patients, can be seen. In the outpatient clinic a certain number of physicians are designated to see these patients. In the specialty clinics a specified period of time is left open each day.

In order to statistically account for these nonappointment patients, a clerk at the particular clinic involved completes an appointment card for each such patient and at the end of each day forwards these cards to the central appointment desk for processing. At the end of each month, data processing incorporates these cards with the regular appointment cards and produces a computer run-off of the monthly outpatient report.

Presently there are still approximately fourteen major and sub clinics not operating in the central appointment

17 FEB 71 TERMINAL DIGIT LIST - HOSPITAL ABEC3-G PAGE 1

NAME	SEX	EX/IMM	CAUSE	DIAG	AGE	CLASS	TYPE	REC	PHONE	REL	DR.	TIME	CLINIC
NORTHCUT ELLIS	F		880		6	610	2	1	[redacted]0	30	005	1415	0041
HENDERSON RAYMOND	M		880		8	560	2	1	[redacted]7	20	003	1100	0041
COLKITT DONNA	F		880		7	640	2	1	[redacted]1	30	003	1300	0041
HEINTZ BLANCHE	F		880		7	650	2	1	[redacted]7	30	005	1015	0041
FUENTES GUILLERMINA	F	350	880		7	610	2	1	[redacted]4	50	005	1430	0041
RODGERS PAUL A	M		880		7	560	2	1	[redacted]7	20	003	945	0041
HODGES HELEN	F		880		7	640	2	1	[redacted]9	30	014	1330	0041
BLAIR GEORGE	M	350	880		7	540	2	1	[redacted]	20	003	1330	0041
WALKER REBA	F		820		5	610	2	1	[redacted]0	02	005	1400	0041
TACZY JOHN	M	350	880		7	540	2	1	[redacted]4	20	014	1530	0041
MYERS HENRY	M	350	880		7	560	2	1	[redacted]3	20	005	845	0041
PASSMORE ELIZABETH	F	350	880		7	640	2	1	[redacted]2	30	003	915	0041
BALLARD SHERYL	F	350	880		5	650	2	1	[redacted]0	02	014	915	0041
HACKER GLORIA	F		880		5	610	2	1	[redacted]4	30	003	1030	0041
MCBRIDE LAUREN	M	350	880		7	540	2	1	[redacted]1	20	003	1500	0041
KENYON LUCILLE	F	350	880		7	650	2	1	[redacted]1	30	003	1000	0041
WESTON PHYLLIS	F		880		6	630	2	1	[redacted]6	30	014	1415	0041
DUNCAN JERRY	M		880		7	560	2	1	[redacted]4	20	014	1445	0041
MORAN JOSEPH	M	350	880		5	550	2	1	[redacted]4	20	014	1500	0041
GONZALES MOLLY	F		880		7	650	2	1	[redacted]8	30	014	1345	0041
ZIMMERMAN RICHARD L	M		880		5	630	2	1	[redacted]9	04	003	1415	0041
HITE TERRI	F		820		5	590	2	1	[redacted]9	30	003	1545	0041
MARTIN JEROLD	M	350	880		7	560	2	1	[redacted]4	20	014	845	0041
NOONEY MARY	F		800		7	630	2	1	[redacted]6	30	005	1500	0041
VARGO LENORA	F		820		7	650	2	1	[redacted]2	30	003	1045	0041
SIMMONS HAROLD	M	350	880		7	560	2	1	[redacted]5	20	005	915	0041

Fig 4.--Terminal Digit List

19 FEB 71 ALPHABETIC APPOINTMENT LIST - HOSPITAL ABE03-D PAGE 1

NAME	SEX	EX/IMM	CAUSE DIAG	AGE	CLASS	TYPE	REC	PHONE	N	REL	DR.	TIME	CLINIC
ADAMS ISABELLE	F		880	6	610	2	1	[redacted]2	[redacted]1	[redacted]8 30	001	900	0261
ADAMS KATHY			830	6	590	2	1				002	900	0161
ALBANO JOA			830	6	610	2	1				002	820	0161
ALBRECHT CHARLES	M		880	7	480	2	2	[redacted]6	[redacted]1		001	900	0096
ALLEN SHARON	F		880	6	610	2	1	[redacted]4	[redacted]1	[redacted]9 30	050	1000	0095
ALLISON DAVID	M		840	6	480	2	2	[redacted]3	[redacted]1		010	1500	0071
ALLISON MARSIA	F		830	6	590	2	1			30	002	1010	0161
ANDERSON ELAINE	F		830	6	610	2	1		[redacted]1	30	002	1020	0161
ANSTETT MARY	F	361	790	5	650	2	1	[redacted]4	[redacted]1	[redacted]0 02	007	1500	0182
ARCHER JUDITH			830	6	610	2	1				002	930	0161
ARCHULETA MARY			830	6	590	2	1				002	1100	0161
ARRINGTON LILLIAN	F	350	880	7	650	2	1	[redacted]6	[redacted]1	[redacted]0 30	014	1045	0041
ASAY MARK	M		880	4	650	2	3	[redacted]3	[redacted]1	[redacted]4 01	001	1300	0281
BAILEY GLENNA	F		830	6	590	2	1		[redacted]1	30	002	940	0161
BAIN JANE A	F		830	5	590	2	1		[redacted]1	30	002	840	0161
BAINES JACQUE			830	6	610	2	1				002	1000	0161
BAKER MARK	M	361	790	4	630	2	3	[redacted]8	[redacted]1	[redacted]7 03	005	1030	0182
BAKER SHIRLEY	F	361	790	7	630	2	1	[redacted]8	[redacted]1	[redacted]7 30	005	1100	0182
BAKER STEPHEN	M	361	790	5	630	2	1	[redacted]8	[redacted]1	[redacted]7 01	005	1000	0182
BALLARD SHERYL	F	350	880	5	650	2	1	[redacted]0	[redacted]1	[redacted]9 02	014	915	0041
BARNES RALPH	M	350	880	7	490	2	1	[redacted]8	[redacted]1	[redacted]4	003	1400	0071
BARR CALEB JR	M		880	6	540	2	1	[redacted]3	[redacted]1	[redacted]9	008	1300	0091
BASSETT PEGGY	F		880	5	650	2	1	[redacted]1	[redacted]1	02	001	1530	0192
BATES DIANA	F		840	6	650	2	1	[redacted]8	[redacted]1	[redacted]3 30	003	920	0071
BATTLES JAMES	M		840	6	480	2	2	[redacted]8		[redacted]3	001	940	0071
BAYLOR LARRY	M		840	6	460	2	1	[redacted]	T1	[redacted]6	003	1100	0071

Fig. 5.--Alphabetical Appointment List

system. The main reason is the preference of the clinic chiefs to maintain a personal or clinic control over certain types of patients. These clinics generate their own appointment cards, but they do forward the cards to the central appointment desk for key punching. These cards are then returned to the clinic for filing until two days prior to appointments when they are forwarded to data processing. So all clinics are mechanized for statistical accounting purposes, and all receive the mechanized listings.

When each clinic has completed its appointments for the day, the "no shows" and cancellations are marked on the mechanized listing and forwarded to the central appointment desk for key punching on a control card. Those appointments are then removed from the files, and a mechanized list is run of patients who cancelled or failed to keep their appointments.

Errors and cancellations which occur at the central appointment desk are marked for duplication. The corrected appointment cards are then returned to the open appointment file.

Fitzsimons General Hospital was a leader in the development of the central appointment system. Many representatives from hospitals throughout the United States and Europe have traveled many miles to study this system in order to properly implement their own central appointment system. General correspondence and letters of appreciation are on file in the Central Appointment Section which attest to this fact.

Capabilities of the Present System

One of the most valid methods of determining the effectiveness of any system is to question the people who use it. With this purpose in mind, the author interviewed fifty patients (active duty and retired military and dependents) throughout the different clinics of the hospital. Interviews and discussions were also conducted with eighteen physicians, several nurses, administrative personnel, and the telephone appointment clerks.

All fifty patients questioned were extremely pleased with the fact that most of the time they were able to see the same physician, on a continuing basis, and at a date and time most convenient to them. However, forty-six of the patients complained, some very bitterly, concerning the number of times the lines into the system were busy and the long wait on the line once the appointment clerk had answered and asked them to "please hold". One woman stated that she had been trying for over a week to get an appointment, but the lines were always busy. Another patient commented that he doesn't bother calling anymore, but just goes directly to the telephone appointment office and requests his appointment personally. The author personally witnessed two ladies utilizing the phones adjacent to the outpatient clinic. One of the ladies waited approximately twenty-seven minutes before being served, and the other waited about thirty-five minutes. When questioned as to why they waited so long, they answered, "because

we knew you were timing the calls." They stated that they had had long waits several times in the past year. They also stated that they would not become nearly as disgruntled over such a long wait if chairs were available for them to use while waiting.

The physicians interviewed were generally pleased with the system. They did state, however, that they preferred to continue to schedule patients in need of more extensive treatment and follow-up care and leave the scheduling of the more routine patients for the central appointment system. They felt that this flexibility was a necessity for the proper care of all patients. As mentioned previously in this paper, this type of flexibility is a built-in feature of the present system. Physicians also stated that they had received numerous complaints from patients concerning the long waiting time in scheduling appointments.

The nurses and clinic administrative personnel questioned were generally pleased with the central appointment system and favored acceptance of the entire scheduling responsibilities by the system. In the areas where the system was doing the scheduling, the personnel claimed they were free to perform the more important aspects of their jobs. They also felt that the scheduling of appointments under the system was more effectively performed than when they did the scheduling themselves.

The telephone appointment clerks were well qualified and performed exceptionally well in their jobs. They thoroughly

enjoyed their work, but readily admitted that their service to the patient had declined with the tremendous increase in workload. They expressed a desire for more people and more adequate telephone equipment so they could increase their efficiency and service.

Waiting time experiments were conducted throughout an eight-day period. The results of these tests can be found in Appendixes H and I. These tests will be referred to again throughout the discussion.

There has been much discussion between the administrative and professional elements of the hospital concerning the prospects of pediatrics and obstetrics scheduling their appointments through the system. The Chief of the Department of Clinics and Community Health Care Services is of the opinion that these two services will be included and that the system must become prepared to accept the additional workload. Currently, pediatrics is scheduling an average of 3,704 appointments per month, and obstetrics is scheduling an average of 1,500 per month. The present appointment system could not now effectively respond to this increased workload.

The central appointment system at Fitzsimons General Hospital has been successful, since its inception, in meeting the objectives as set forth in the beginning of this chapter. However, time is again demanding a change in the system of scheduling patients. Clinic visits, appointments, and patient services, in general, are continuing to increase. The system

as a whole is structured well, but certain parts are weak. These parts must be replaced or strengthened, as the case may be, so that the system will be more responsive to the patient's needs.

Weaknesses of the System

Based upon a three-week study of the central appointment system, the author's opinion is that the major weaknesses of the system lie in the areas of policies and procedures, personnel, and equipment. These three areas are discussed in detail in the following pages.

Policies and procedures

In discussing procedures--the answering of the twelve lines coming into the system--with the telephone appointment clerks, the author learned that there were no priorities or answering patterns. There are three columns of buttons on the phone panel (see Appendix J). The two columns on the left light up when a patient is on the line and being served. When a patient is waiting on the line to be served, the light buttons blink. In-hospital lines, however, just stay lighted whether a patient is waiting for service or being served. The in-hospital lines are the first four buttons on the right of the panel. Extra long waits occur here because the lights don't blink when the patient is waiting and because no one has specific responsibility for these lines. In observing forty patients utilizing the in-hospital lines, the author

noticed that eleven of them left before being served and that the average waiting time was six minutes. Five of the patients waited over ten minutes before being served. When a specific clerk was assigned to these lines, the average waiting time for forty patients dropped to one and one-half minutes, and the longest wait was four minutes. If each clerk were assigned certain lines to answer, less confusion and faster service would result. With the present telephone equipment it is impossible to know which patient entered the system first.

Currently, the system closes during the noon lunch hour. If the clerks' lunch hours were staggered, another hour for scheduling appointments would be added to the day and perhaps calls would be spread out more. During a visit to Denver General Hospital, Denver, Colorado, the author learned that this technique was quite successfully used there.

Personnel

Currently, the authorized personnel within the central appointment system are as follows:

One--Supervisor (GS-6)

Five--Telephone Appointment Clerks (GS-4)

Two--Key-Punch Operators (GS-3)

One--Receptionist, Outpatient Clinic (GS-4)

Two--WAC Clerk Typists (Sp-4)
(Only one is currently assigned)

During the last manpower survey, which was concerned with the period from August 1968 through July 1969, the survey team

recommended that one more telephone clerk be authorized (see Appendix K). That additional person was never received, and since that time the work load (as revealed in Appendixes D and F) has markedly increased.

The system personnel are currently handling a maximum workload. During the twenty hours that the author spent in actually working with the appointment clerks, he found their endurance, patience, and tact to be phenomenal. They were exceptionally courteous and helpful in their dealings with the patients. But, the demands were obviously too great for five clerks to handle. They voluntarily skipped all break periods and left their desks infrequently for no more than a minute or two at a time. The total idle time in twenty hours was observed to be no more than forty minutes. The clerks averaged 1.8 minutes per call.

At the writer's request, five appointment clerks were utilized during the week of March 14, 1971, and six were used during the next week. The results of this test can be seen in Appendixes H and I. With one additional clerk there was a decrease in average waiting time and in the number of busy signals. There are, however, still a number of extra long waits which happen when the system is crowded and the clerks cannot know who entered the system first.

It should be pointed out that many times only four clerks were scheduling appointments because one clerk had to constantly keep the appointment cards up-to-date and filed. In order to

put a sixth person at the appointment desk, this filing had to be delayed and one of the key-punch operators relieved of her key punching duties for the day. All appointment clerks and key-punch operators are cross-trained.

Each appointment clerk is currently averaging eighty appointments and seventy-one requests for information per day. The manpower survey recommendations allowed for one appointment clerk per fifty daily appointments, and no consideration was given for information calls. Basing judgment on the preceding information, since there is no manpower yardstick for this type of activity, the writer believes that the central appointment system should be authorized eight appointment clerks or three over their present strength.

Doble, in writing about Walter Reed's central appointment system, states that five appointment clerks handle between 300 and 600 calls per day.[1] Fitzsimons is now receiving an average of 755 calls per day with the same number of clerks. The central appointment system supervisor at Denver General Hospital claims that her system schedules approximately 500 appointments per day with ten clerks.

During the week of March 14, 1971, the appointment clerks at Fitzsimons scheduled 1,999 appointments and responded to 1,668 patient information requests. This was an average of 734 calls per clerk for the week.

Equipment

The eight incoming telephone lines, five from off-post and three from on-post, are inadequate to handle the patient

load. The four in-hospital lines are adequate. The test results showed that out of 185 calls into the system, forty-five were busy, or just about one call in four resulted in a busy signal. Except for in-hospital lines, long waits were present even when clerks were assigned certain lines to answer (the in-hospital lines are a direct connection with no dialing necessary).

Presently each telephone line is receiving approximately sixty-five calls per day. If one line were added to the off-post lines and one to the on-post lines, the number of busy signals would be lessened. Even with the addition of telephone lines there will still be long waits by many patients since there is no way of determining which patient entered the system first.

Certainly, Fitzsimons is not alone with this type of problem. Greer Williams recently wrote of the scheduling problems in the Kaiser-Permanente System. Kaiser has complained that their switchboards are perpetually busy and that patients have been left waiting for as much as thirty minutes.[2] Other hospitals have suffered with this same scheduling problem. Some of these hospitals are the Childrens Hospital Medical Center, Boston;[3] Hennepin County General Hospital, Minneapolis;[4] and Denver General Hospital, Denver.

Similar to the situation so many of these other hospitals are facing today, Fitzsimons is attempting to perform

its scheduling of appointments with outmoded equipment and an insufficient number of personnel. It is impossible to efficiently and effectively respond to the scheduling of from 8,000 to 9,000 patients per month with a system that was designed to schedule between 5,000 and 6,000 patients.

The Chief, Department of Clinics and Community Health Care Services, and his staff are well aware of these problems. Currently being considered is the installation of an automatic call distribution (ACD) system which would be connected into the present telephonic equipment. This system would allow for incoming calls to be automatically routed to the first available appointment clerk. When the number of incoming calls exceeded the number of available attendents, the switching device within the system would automatically route the overflow calls to an automatic recording device which informs the caller that all lines are temporarily busy and that an appointment clerk will answer as soon as a line is available. These overflow calls would be automatically stacked in order of arrival on the line. As the lines became clear, the patients would be routed into the system in the order of their arrival on the waiting line. This equipment would allow for expansion and would include fourteen incoming lines--an increase of two over the present system. The addition of only one more clerk would be sufficient after the installation of this equipment.

Installation of the ACD system would provide patients with a first-come, first-served method of making appointments.

It is the author's opinion that this equipment would significantly reduce the busy signals and waiting time. The overall results would be a much better system of service to the patient. As referred to in the previous chapter, these results were experienced by other hospitals employing this system.

Footnotes

[1]Henry P. Doble, Jr., "Streamlining Walter Reed's Central Appointment System." Hospital Topics, XLII (October, 1964), 42.

[2]Greer Williams, "Kaiser," Modern Hospital, CXVI (February, 1971), 85.

[3]Leonard W. Cronkhite, "Computer Brings Order to Clinic Scheduling System," Hospitals, XLIII (April 16, 1969), 55-57.

[4]Eduardo L. Villegas, "Outpatient Appointment System Saves Time for Patients and Doctors," Hospitals, XLI (April 16, 1967), 52-102.

CHAPTER III

CONCLUSION

Conclusions

Fitzsimons General Hospital has a definite need to strengthen the central appointment system in order to adequately serve current and future patient demands. The existing personnel strength and outmoded equipment are barely able to perform the daily functions of the section.

The staff at Fitzsimons General Hospital has recognized the need for change and the fact that technological advancement in new equipment must be utilized in order to cope with the growing demands for outpatient services.

Recommendations

It is recommended that:

1. An automatic call distribution system (ACD) be installed into the present system.

2. Three more appointment clerks be employed.

3. Prior to the installation of the ACD system, patterns for answering calls should be set for appointment clerks.

4. Chairs should be provided for the patients next to the central appointment system phones adjacent to the outpatient clinic.

5. The appointment system should remain open during the noon hour.

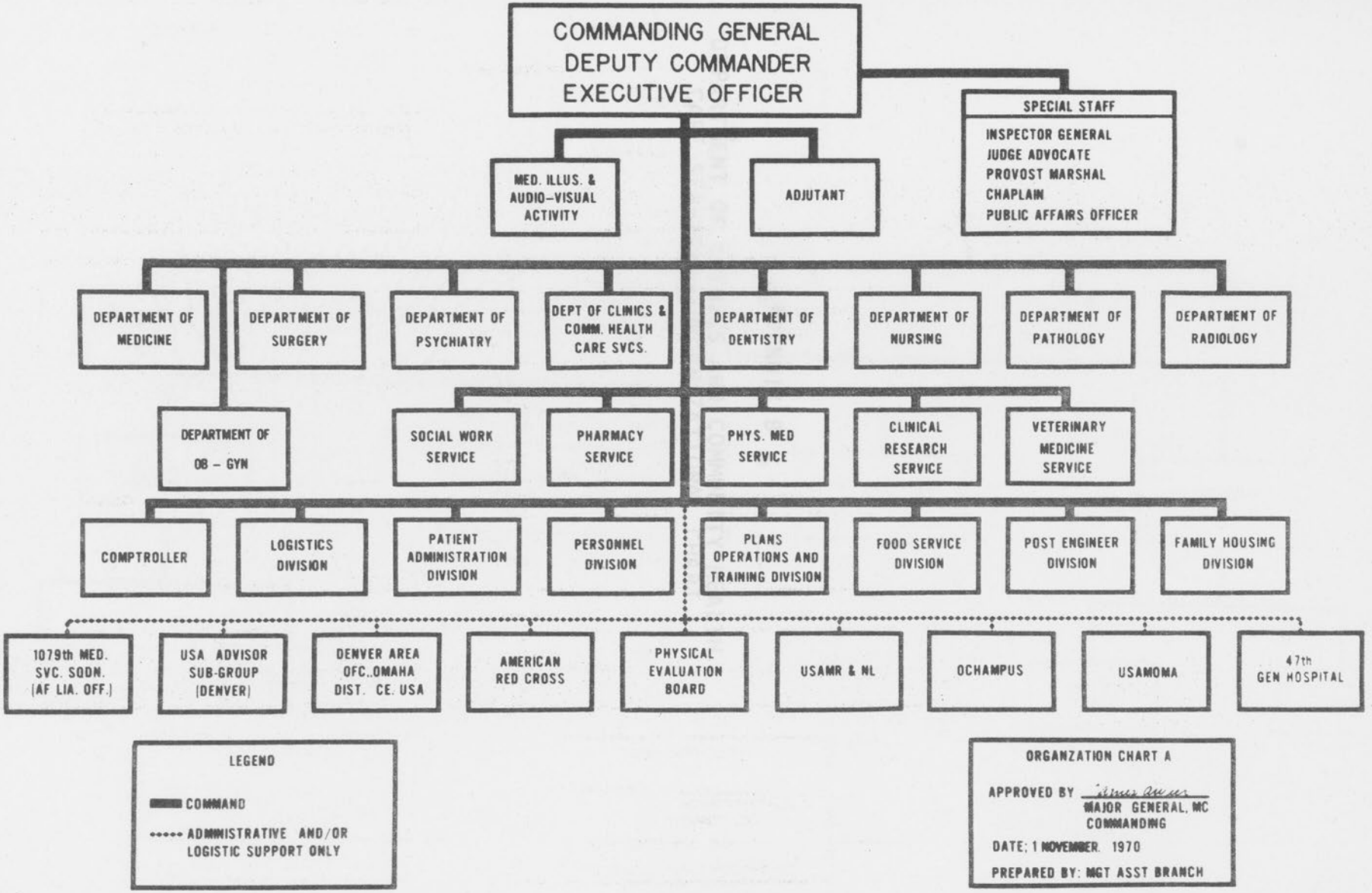
6. Three more telephone lines should be added to the present system.

APPENDIX A

HOSPITAL ORGANIZATIONAL CHART

DEPARTMENT OF THE ARMY

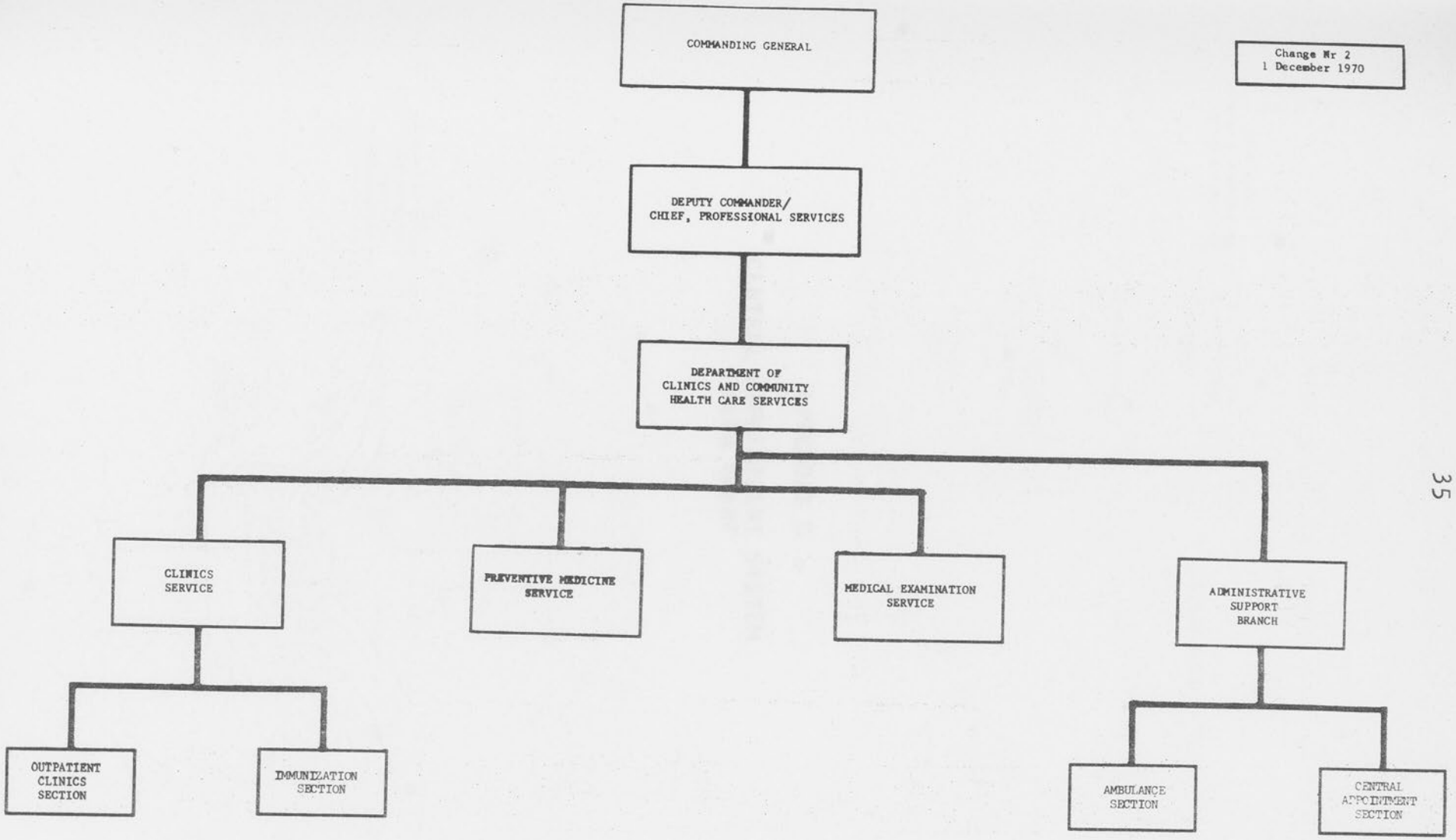
FITZSIMONS GENERAL HOSPITAL



APPENDIX B

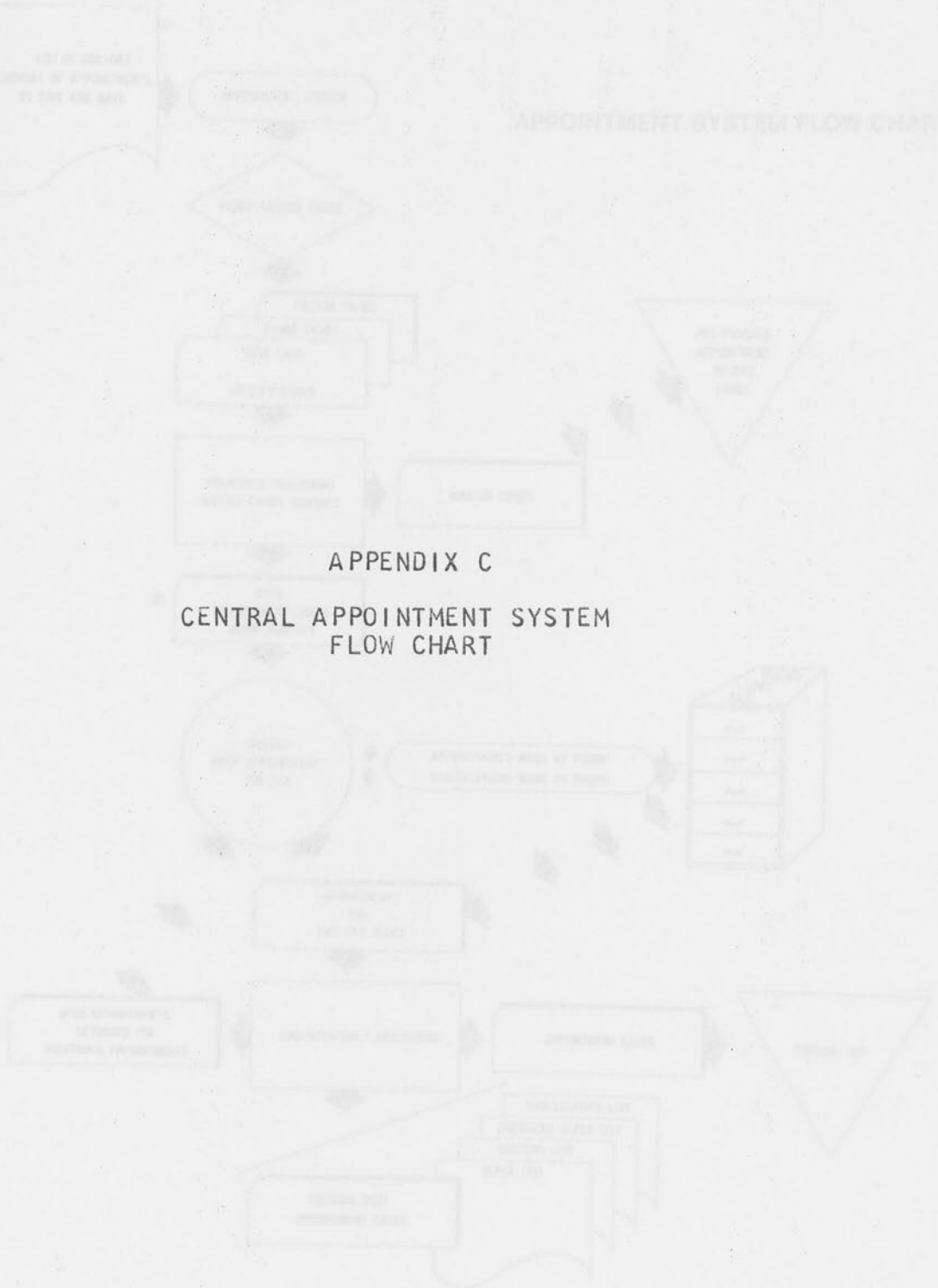
DEPARTMENT OF CLINICS AND COMMUNITY HEALTH CARE SERVICES--ORGANIZATIONAL CHART

Change Nr 2
1 December 1970

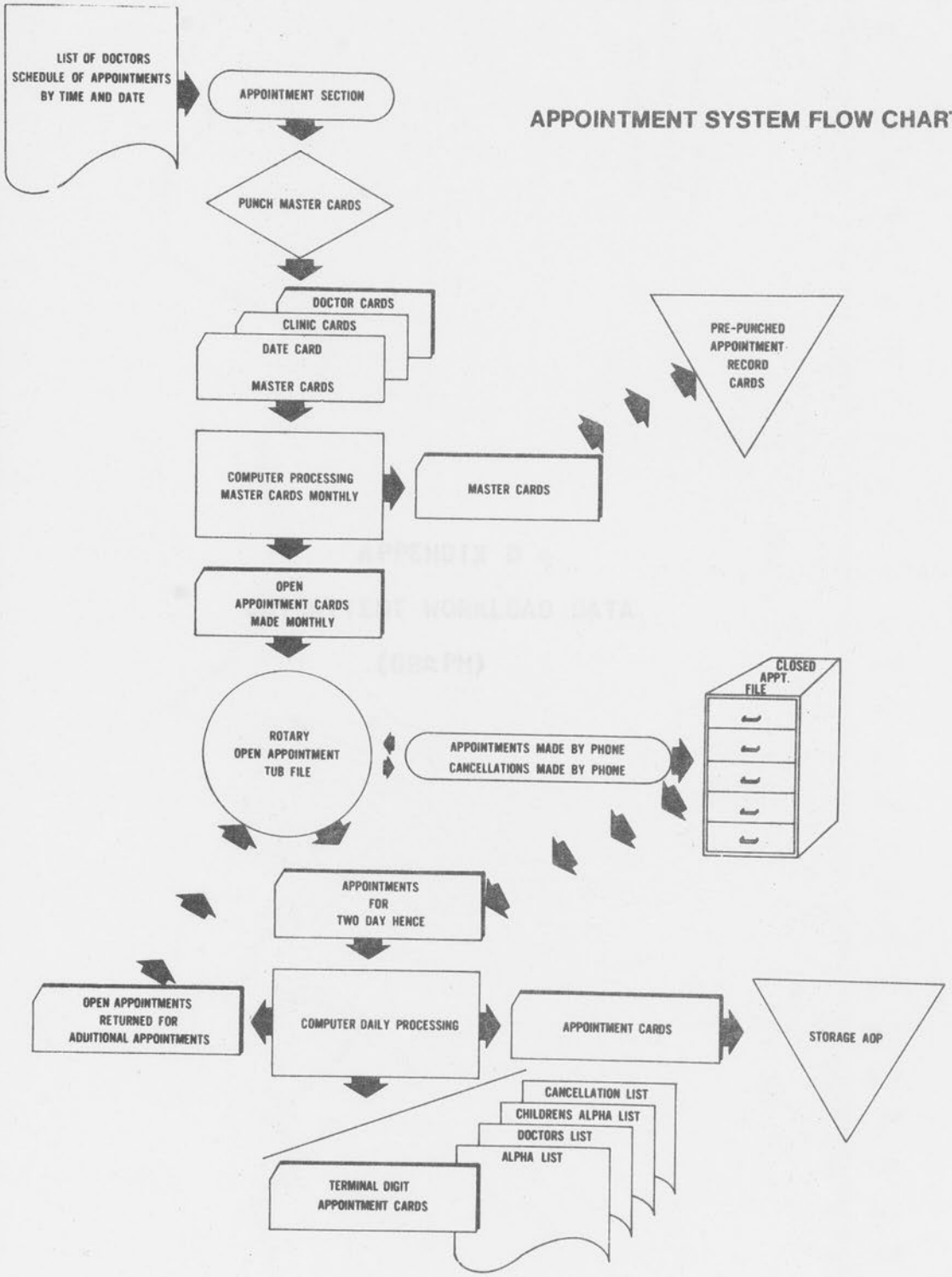


APPENDIX C

CENTRAL APPOINTMENT SYSTEM FLOW CHART



APPOINTMENT SYSTEM FLOW CHART

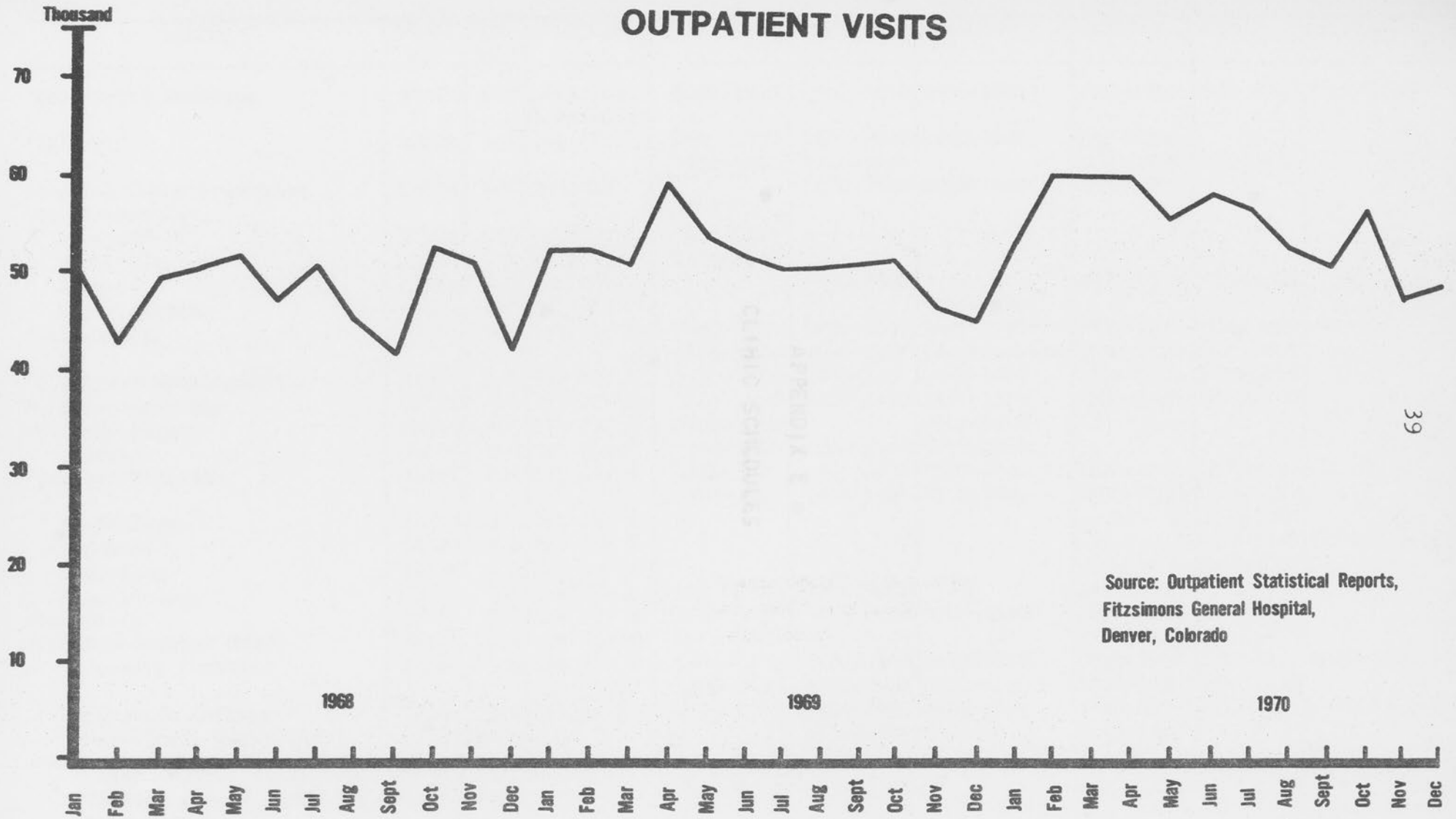


APPENDIX D

OUTPATIENT WORKLOAD DATA

(GRAPH)

OUTPATIENT VISITS



Source: Outpatient Statistical Reports,
Fitzsimons General Hospital,
Denver, Colorado

APPENDIX E

CLINIC SCHEDULES

DEPARTMENT OF MEDICINE CLINICS SCHEDULE

CLINIC	PHONE NO	BLDG NO	LOCATION	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Adolescent Medicine	27261	507	Adol.Med. & Ped.Cl.	0900-1800	0900-1800	0900-1300	0900-1800	0900-1800	0900-1130
*Allergy	23134	500	1st Flr E	0900-1200 1300-1630	0800-1200 1300-1630	0900-1200	0900-1200 1300-1630	1300-1630	
*Cardiac Catheterization	25212	500	Rm 1019		0800-1200	0800-1200	0800-1200		
*Cardiovascular:									
AD-AFEES	25212	500	Rm 1012	0830-1130					
Pediatrics	25212	500	Rm 1012	1300-1500					
General	25212	500	Rm 1012		1300-1600		0830-1130	0930-1130	
Hypertension	25212	500	Rm 1012			0800-1130			
*Dermatology	25111	500	1st Flr N	0800-1200 1300-1630	0830-1200 1300-1630	0800-1200*** (AcneRecheck)	0900-1200 1300-1630	0800-1200 1400-1530	****
Electroencephalographic	26207	500	1st Flr E	0800-1530	0800-1530	0800-1530	0800-1530	0800-1530	
*Gastroenterology	23225	500	1st Flr E	1300-1500	1300-1430	1300-1530	1300-1530	0900-1200	
*Gl Endoscopy	23225	500	1st Flr E	0800-1030		0800-1000			
Procto	23225	500	1st Flr E	1030-1200	0800-1000	1000-1200			
*General Medicine	25123	500	1st Flr E	0930-1200 1300-1530	0800-1200 1300-1530	0800-1200 1300-1630	0930-1200 1300-1630	0900-1200 1300-1500	
Hematology	25123	500	1st Flr E					1230-1430	
Lyphomas	25123	500	1st Flr E					1230-1430	(2d Fri Only)
Metabolic	25123	500	1st Flr E					0800-1030	
Rheumatology	25123	500	1st Flr E	(Gold Clinic)	1300-1500		1300-1500		
*Neurology	22136	500	1st Flr E	1300-1600		1300-1600	0900-1200	1300-1600	
*Non-Tuberculous Chest	24221	500	1st Flr E				0915-1200		
Pulmonary Function	21134	500	1st Flr W	0800-1200 1300-1630	0800-1200 1300-1630	0800-1200 1300-1630	0800-1200 1300-1630	0800-1200 1300-1630	0800-1200
Inhalation Therapy**	23102	500	2d Flr E	0800-2300	0700-2300	0700-2300	0700-2300	0700-2300	0700-2300
Tuberculosis Outpatient	26134	5408			0915-1200		0915-1200		

*Under Central Appointment System, Extension 27291 or 364-9171

**Sundays also from 0700 to 2300 hours

#Wart Clinic

***Except 1st Wed of ea mo which is Monthly Consultants' Meeting in Derm. Clinic 0900-1200

****Special procedures scheduled by doctors only

DEPARTMENT OF MEDICINE CLINICS SCHEDULE (Cont)

CLINIC	PHONE NO	BLDG NO	LOCATION	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Pediatrics:									
General	27261	507	Ped. Cl.	0745-1200 1300-1615	0745-1200 1300-1615	0745-1200 1300-1615	0745-1200 1300-1615	0745-1200 1300-1615	0800-1145
Allergy	27261	500	1st Flr E	0900-1200	0900-1200	0900-1200	0900-1200	0900-1200	
Cardiology	25212	500	Rm 1012	1300-1600					
Dermatology	25111	500	1st Flr N			0900-1200			
Endocrinology	27261	507	Ped Cl.				1300-1600	(4th Thurs)	
Hematology	23212	507	Ped Cl.				1300-1600	(1st & 3d Thurs)	
Neurology	23212	507	Ped Cl.		1300-1600				
Renal and Metabolic	27261	507	Ped Cl.	0900-1200					
Well Baby	27261	507	Ped Cl.		0900-1200		0900-1200		
ENT	24131	500	1st Flr W					1300-1500	
Orthopedics	21124	500	5th Flr S				1300-1630		
Informal Clinic (time and schedule varies, patients selected)									
Child Guidance Problems	24102	815					p.m.		

DEPARTMENT OF DENTISTRY CLINICS SCHEDULE

Routine Examinations	22238	500	1st Flr W	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	
Contagious Disease Patients (Emergency)	21109	502	(Call for treatment time)						
Emergency Treatments	22238	500	1st Flr W	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100 1230-1500	0745-1100

*Under Central Appointment System, 27291 or 364-9171

DEPARTMENT OF SURGERY CLINICS SCHEDULE

CLINIC	PHONE NO	BLDG NO	LOCATION	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Chest Surgery	24232	500	7th Flr W		1400-1600				
Cleft Palate	24206	500	Dushnell		1400-1545	(3d Tues Ea Mo)			
Cystoscopy	22219	500	Rm 7036			0800-1100		0800-1100	
*Ear, Nose and Throat:									
Routine Audiograms	24131	500	1st Flr W	0800-1630	0800-1530	0800-1530	0800-1530	0800-1530	
Otolaryngology	24131	500	1st Flr W	1300-1500	0930-1100		0800-1100	1300-1500	
Endoscopy	23120	500	Rm C3001		0800-1630				
*Eye (Ophthalmology)	21215	500	1st Flr W	1300-1630	0900-1630	0900-1630	0900-1630	1300-1530	
*Refractions	26103	515	2nd Flr	0745-1630	0745-1630	0745-1200	0745-1630	0745-1630	
Routine Phys Exam	21215	500	1st Flr W		0800-0900	0800-0900	0800-0900		
*General Surgery	24218	500	5th Flr N	0810-1540	0810-1400		1300-1440	0810-1130	
Minor							0930-1100		
*Gynecology:									
Infertility	21141	500	6th Flr C				1100-1130	1300-1500	
*Gynecology	21141	500	6th Flr C	1300-1630	1300-1630	1300-1630	1300-1630		
Preoperative	21141	500	6th Flr C					1300-1400	
Postoperative	21141	500	6th Flr C		1000-1200				
Oncology	21141	500	6th Flr C					1300-1500	(Last Friday ea. mo.)
*Neurosurgery	22238	500	Rm 5075	1300-1530			1300-1530		
Obstetric:									
*Initial Pnt Interviews	21141	500	6th Flr C	0900-1100	0900-1100	1300-1500	0900-1200		
				1300-1500	1300-1500				
New Patient Phys Exams	21141	500	6th Flr C	0800-1200					
Return Prenatal Visits	21141	500	6th Flr C			0800-1200		0800-1200	
*Family Planning Clinic	21141	500	6th Flr C				1300-1630		
*Postpartum	21141	500	6th Flr C						
OB Complications	21141	500	6th Flr C		1000-1200				

*Under Central Appointment System, Extension 27291 or 364-9171

DEPARTMENT OF SURGERY CLINICS SCHEDULE (Cont)

CLINIC	PHONE NO	BLDG NO	LOCATION	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
*Orthopedic	21124	500	Rm 5154	0900-1130 1300-1630	0900-1130 1300-1630	0900-1130 1300-1630	0900-1130 1300-1630		
Plastic	24206	500	3rd Flr E	1300-1500	1300-1500		1300-1500	1300-1400	
*Podiatry	25208	500	Rm 5068	0900-1200 1300-1630	0900-1200 1300-1630	0900-1200 1300-1630	0900-1200 1300-1630	0900-1200 1300-1630	
(Military Personnel will be seen between 0745 and 0900 hours)									
Tumor	24219 (25247)	500	Bushnell Aud					1530-1630	(2d & 4th Fridays)
*Urology	22219	500	Rm 7036	1300-1500			1300-1500		
PHYSICAL MEDICINE SERVICE CLINICS SCHEDULE									
Occupational Therapy:									
General Clinic	22226	517	Gr Flr E	0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	
Neuropsychiatric	22122	606		0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	
Tuberculous	26204	409		0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	0800-1200
Physical Medicine	23211	500	Gr Flr E	0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	0800-1200
Physical Therapy	21125	500	Gr Flr E	0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	0800-1200
DEPT OF CLINICS AND COMMUNITY HEALTH CARE SERVICES									
*Dispensary	27271	500	Gr Flr W	0830-1630	0830-1630	0830-1630	0830-1630	0830-1630	0830-1200
Military Sick Call	27271	500	Gr Flr W	0730	0730	0730	0730	0730	
Physical Examinations	22138	409	2d Flr	0745-1630	0745-1630	0745-1630	0745-1630	0745-1630	
(Note that Emergencies Will Be Seen Anytime)									
DEPARTMENT OF RADIOLOGY									
Thyroid Clinic	22133	T511	West	0800-1200		0800-1200			

*Under Central Appointment System, Extension 27291 or 364-9171

DEPARTMENT OF PSYCHIATRY CLINICS SCHEDULE

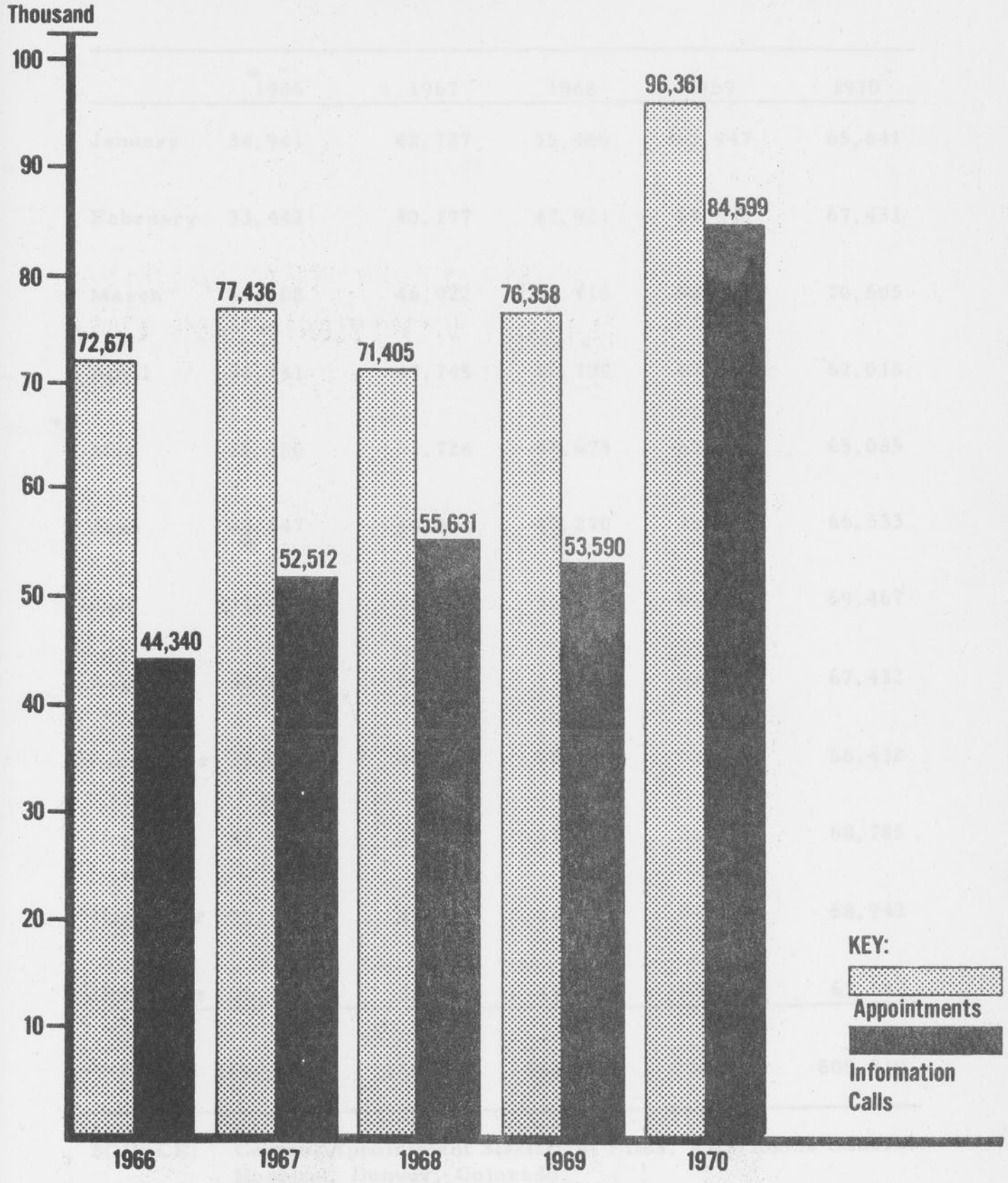
CLINIC	PHONE NO	BLDG NO	LOCATION	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Clinical Psychology:									
Mothers' Gp Therapy	22230	815	Upper Flr	0930-1030					
Childrens' Gp Therapy	22230	815	Upper Flr		1530-1630				
Teenagers' Gp Therapy	22230	815	Upper Flr			1530-1630		1530-1630	
Pre-Adolescent Boys' Gp	22230	815	Upper Flr	1630-1730					
Early Adolescent Gp	22230	815	Upper Flr			1630-1730			
Child Guidance Screening (Intake Conf)	22230	815	Upper Flr					1300-1600	
Psychiatric Consultation:	25216	815	Lower Flr	0800-1600	0800-1600	0800-1600	0800-1600	0800-1600	0800-1600
Marital Counseling	25216	815	Lower Flr			1730-1900			
Gp Therapy (Adult Fem)	25216	815	Lower Flr				0900-1000		
Medication Clinic	25216	815	Lower Flr		1300-1500		1000-1200		
Problem Drinkers' Couples' Gp	25216	815	Lower Flr		1630-1800				
Child Guidance Clinic:	24102	815	Lower Flr	0800-1600	0800-1600	0800-1600	0800-1600	0800-1600	
Latency Therapy Group	24102	815	Lower Flr		1630-1800				
Parents' Counseling Gp	24102	815	Lower Flr		1630-1800				
Early Adol. Girls' Gp	24102	815	Lower Flr			1600-1700			
Parents' Counseling Gp	24102	815	Lower Flr			1600-1700			
Early Adol. Boys' Gp	24102	815	Lower Flr				1630-1730		
Parents' Counseling Gp	24102	815	Lower Flr				1630-1730		
Child Guidance Screening Com.	24102	815	Lower Flr					1300-1600	
				FOOD SERVICE					
*Diabetes Class	22246	500	1st Flr E		1400				
*Nutrition	22246	500	1st Flr E	0900-1200		0900-1200		0900-1200	
*Obesity Class	22246	500	1st Flr E	1400					

*Under Central Appointment System 27921 or 364-9171

APPENDIX F

CENTRAL APPOINTMENT SYSTEM WORKLOAD DATA

ANNUAL APPOINTMENTS AND INFORMATION CALLS



Source: Central Appointment Statistical Files, Fitzsimons General Hospital,

CARDS KEY PUNCHED

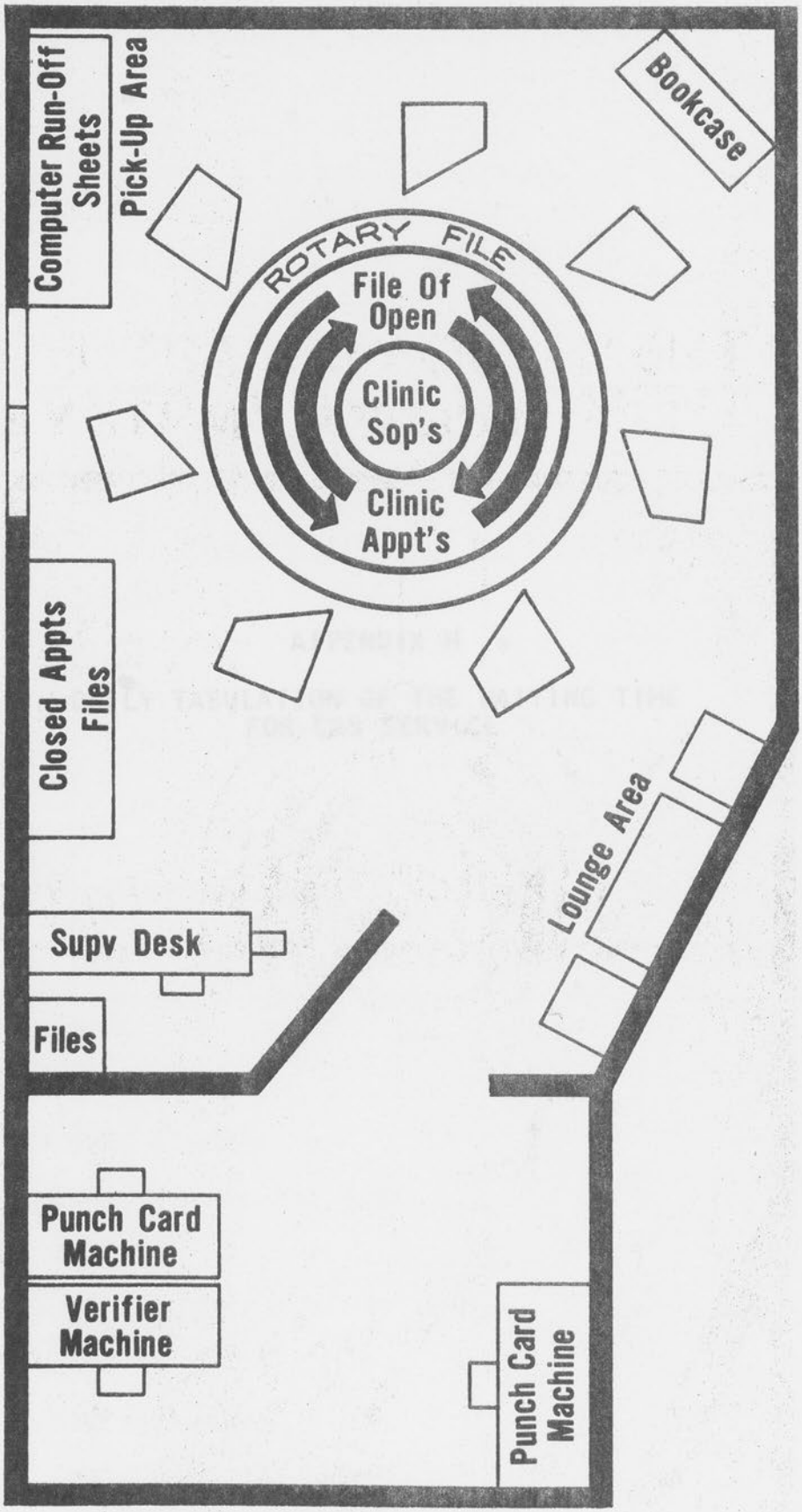
	1966	1967	1968	1969	1970
January	34,941	42,727	55,480	60,947	65,641
February	33,448	40,177	47,921	64,842	67,431
March	41,908	46,922	54,916	58,209	70,505
April	36,141	47,745	56,727	67,514	67,015
May	35,680	51,724	52,675	65,148	65,085
June	43,647	48,032	49,270	78,348	66,533
July	31,443	48,231	53,777	61,967	69,467
August	50,818	51,982	57,217	63,379	67,432
September	36,096	44,098	52,223	62,978	68,432
October	43,895	55,114	63,064	66,285	68,785
November	39,952	47,973	62,575	64,178	68,942
December	36,126	40,361	49,766	65,641	63,542
TOTAL	464,089	565,086	655,611	779,436	808,810

SOURCE: Central Appointment Statistical Files, Fitzsimons General Hospital, Denver, Colorado.

APPENDIX G

CENTRAL APPOINTMENT SYSTEM
LAYOUT DIAGRAM

CENTRAL APPOINTMENT SYSTEM LAY-OUT



PUNCH CARD AND VERIFIER MACHINES
SOUND PROOF ROOM

APPENDIX H

DAILY TABULATION OF THE WAITING TIME FOR CAS SERVICE

PATIENT WAITING TIME

HOURS	MONDAY 15 March	TUESDAY 16 March	THURSDAY 18 March	MONDAY 22 March	THURSDAY 25 March	TOTALS (Minutes)
0800 0900	2.5/5/1/1	0/10.5/1/6	0/0/5/4	5/1/1/0	0/1/10/7	61
0900 1000	14/5/8/2	7/5/0/1	0/0/1/1	6/4/19/1	7/4/1/1	87
1000 1100	7/14/2/0	0/0/0/1	11/1/18/0	0/0/0/0	0/1/1/18	74
1100 1200	0/0/5/0	4/3/8/11	0/13/1/5	5/1/9/0	0/0/1/1	67
1200 1300	C	L	O	S	E	D
1300 1400	0/9/21/11	1/0/7/5	4.5/1/2/1	4/1/0/0	0/0/1/0	68.5
1400 1500	5/3/1/1	4/0/0/11	21/6/1/7	18/5/1/1	0/0/3/7	95
1500 1600	0/0/2/1	7/5/1/0	1/0/3/5	4/1/0/0	11/4/0/1	46
T.W.T. / B	120.5 / 15	98.5 / 11	111.5 / 6	88 / 7	80 / 6	498.5 / 45
P.B.S.	34.9	28.2	17.6	20.0	17.6	24.3
A.W.T.	4.3	3.5	3.9	3.1	2.8	3.5
T.C.	43	39	34	35	34	185

T.W.T. - Total Waiting Time

B - Busy Signals

P.B.S. - Per Cent Busy Signals

A.W.T. - Average Waiting Time Per Call

T.C. - Total Calls

5 servers 15-18 March 1971

6 servers 22-25 March 1971

12 lines coming into system

APPENDIX I

DAILY TABULATION OF THE NUMBER OF PATIENTS WAITING FOR CAS SERVICE

NUMBER OF PATIENTS WAITING ON TELEPHONE LINES (ON HOLD)

HOURS	MONDAY 15 March	WEDNESDAY 17 March	FRIDAY 19 March	MONDAY 22 March	WEDNESDAY 24 March	A.O.L.
0800 C9C0	6/6/3/3	5/5/5/5	0/1/3/2	5/4/5/4	0/0/3/2	3.3
0900 1000	6/6/6/4	4/4/3/4	3/4/4/4	6/5/4/5	1/2/1/3	4.0
1000 1100	6/6/6/6	5/6/1/5	5/2/5/5	4/4/3/3	2/4/3/3	4.2
1100 1200	1/0/3/1	4/2/4/0	4/4/4/4	1/1/0/1	6/5/2/2	2.4
1200 1300	C	L	O	S	E	D
1300 1400	4/3/0/0	0/1/3/1	4/3/2/1	6/5/4/4	4/2/0/2	2.5
1400 1500	6/6/6/6	1/4/5/2	1/5/5/4	4/4/2/1	2/6/5/1	3.8
1500 1600	5/3/3/1	0/0/0/0	3/3/2/2	2/2/4/4	1/0/1/0	1.8
A.O.L.	4	2.9	3.2	3.5	2.2	3.16

A.O.L. - Average patients waiting on line

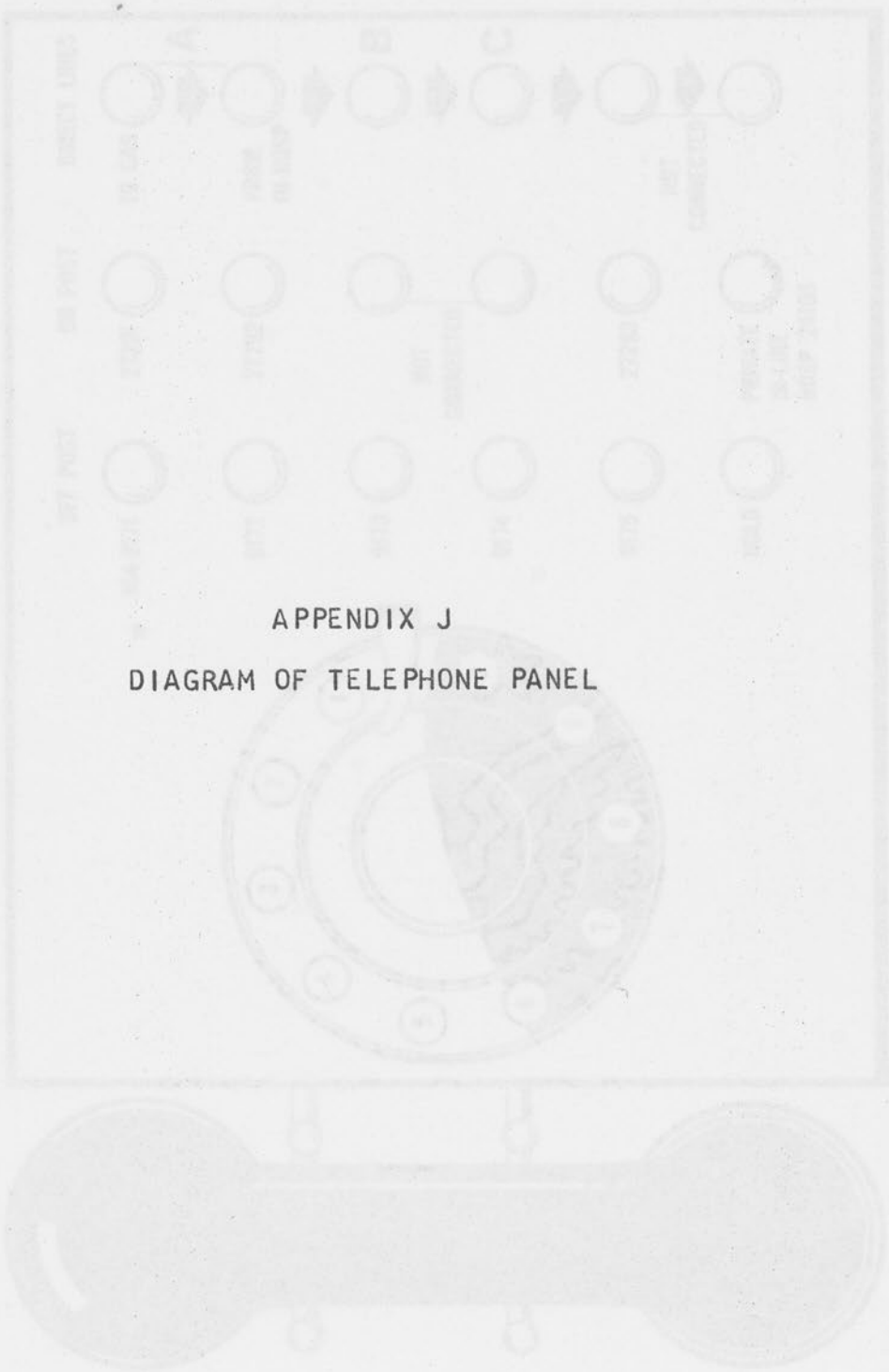
5 servers on 15-19 March 1971

6 servers on 19-24 March 1971

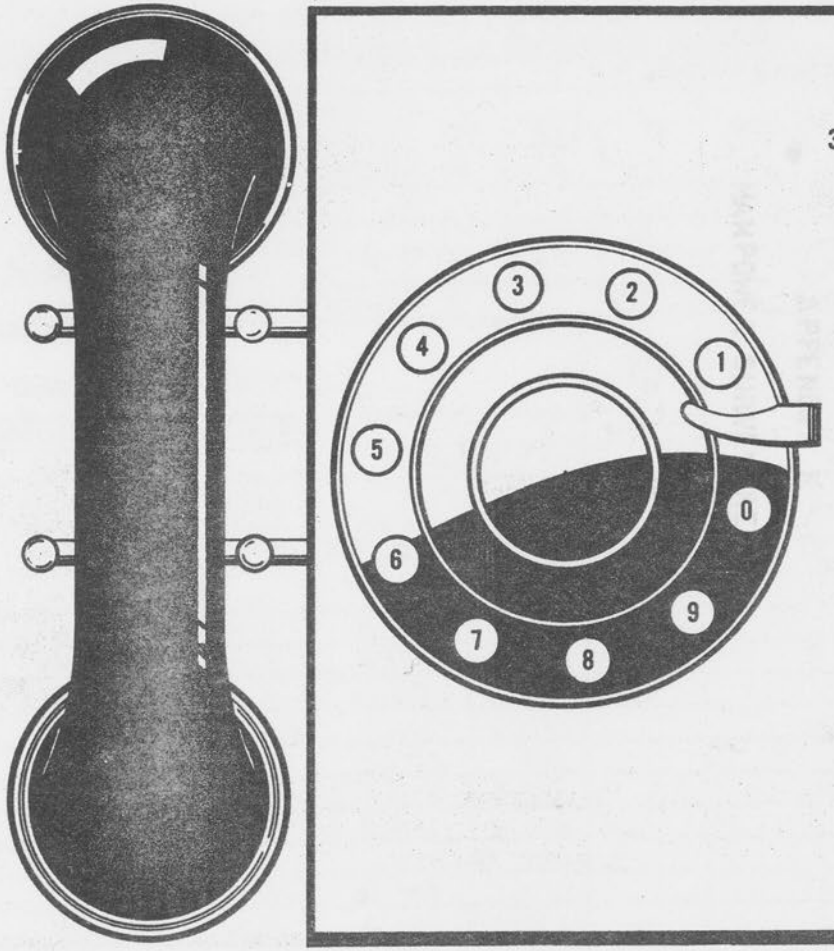
12 lines into system

APPENDIX J

DIAGRAM OF TELEPHONE PANEL



PHONE AND PANEL/CALL DIRECTOR



	OFF POST	ON POST	DIRECT LINES
	364-9171	27291	TO CAS
A			
	9172	27292	FROM IN-HOSP
B	9173		
		NOT CONNECTED	
C	9174		
	9175	27293	
			NOT CONNECTED
	HOLD	PRIVATE IN-LINE HOSP 24106	

A OUT PATIENT CLINIC

B GEN MED CLINIC 1st FLOOR EAST

C 5th FLOOR SURGERY ORTHOPEDICS PODIATRY

APPENDIX K

MANPOWER SURVEY REPORT

MANPOWER UTILIZATION SURVEY REPORT - SCHEDU
MANPOWER AND WORKLOAD DATA (AR 1-45)

Sheet ____ of ____ sheets

REPORTS CON ... SYMBOL CSFC-5

MAJOR STAFF ELEMENT	DIVISION	BRANCH	SECTION OR UNIT	SHEET NO.	LINE NO.
FITZSIMONS GEN HOSPITAL	DEPT OF HOSPITAL CLINICS	GEN OP AND MIL DISPENSARY SVC	CENTRAL APPT SECTION	7	22

DESCRIPTION OF WORK PERFORMED

Operates the Central Appointment System for 34 Clinics. Key punches appointment cards for those clinics and for Pediatric Clinic and OB Clinic appointments. Furnishes punched appointment cards to Data Processing Branch for machine listings of daily appointment schedules for each clinic. Key punches IBM card for each visit of patients to all clinics, including walk-ins, for use by Data Processing Branch in preparing monthly Outpatient Report for submission by Registrar to OTSG. AMS CODE 2420.1300

YARDSTICK CODE: None

WORK UNIT: Total Number Appointments Made

SECTION A - SUMMARY OF MANPOWER

	OFF a	ANC & AMSC b	WO c	ENL d	US CIV e	NON-US CIV	TOTAL MANPOWER SUBJ TO AUTH g	OTHER MANPOWER US h	OTHER MANPOWER NON-US i	TOTALS j
1. AUTHORIZED					9		9			9
2. ACTUAL STRENGTH					7		7			7
3. RECM BY CO					10		10			10
4. RECM BY SURVEY TEAM					10		10			10

YARDSTICK ALLOWANCE COMPUTATION

SEE SURVEY TEAM REMARKS-SECTION D

SECTION B - PERFORMANCE DATA

MONTH a	MANPOWER AVG STR b	MANPOWER TOTAL MAN-HOURS WORKED c	MANPOWER HRS OP IN MO d	MANPOWER EQUIV MAN-MONTHS (c ÷ d) e	WORKLOAD NO. OF WORK UNITS f	WORKLOAD W/L PER PERSON (f ÷ e) g
Aug68	6	1,021	176	5.8	6,185	1,066
Sep	6	912	160	5.7	5,528	970
Oct	6	1,012	184	5.5	6,224	1,132
Nov	6	810	152	5.3	5,491	1,036
Dec	7	1,043	168	6.2	5,090	821
Jan69	7	1,098	176	6.2	7,218	1,164
Feb	7	909	152	6.0	6,023	1,004
Mar	7	921	160	5.8	6,575	1,134
Apr	7	985	176	5.6	6,370	1,138
May	7	974	168	5.8	6,357	1,096
Jun	7	1,000	168	6.0	5,852	975
Jul	7	1,009	168	6.0	5,662	944
1. WORKLOAD USED AS BASIS OF APPRAISAL					6,100	
2. AVERAGE PRODUCTIVITY						1,000

3. MANPOWER ALLOWANCE

SURVEY WORKLOAD (1) / AVG PRODUCTIVITY (2) = 6100 / 1000 = 6.1 × 1.11 = 6.8

HB, 145

SECTION C - MANPOWER

AUTH STR a	RANK OR GRADE b	ACTUAL STR c	RANK OR GRADE d	JOB TITLE e
1	GS-6	1	GS-6	Supv Tele Appt Clerk
6	GS-4	6	GS-4	Tele Appt Clerk Typist
2	GS-3	-		Card Punch Operator

RECOMMENDED BY SURVEY TEAM

NO.	TYPE	FUNCTIONAL JOB TITLE	NO.	TYPE	FUNCTIONAL JOB TITLE
1	Mil	Supv Tele Appt Clerk			
9	Mil	Tele Appt Clerk Typist			

ENTER SPECIFIC REMARKS ON REVERSE SIDE.

58

DA FORM 1 NOV 66 140-4 REPLACES DA FORM 1405, 1 NOV 62, WHICH WILL BE USED.

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ABSTRACT

AN ANALYSIS OF THE MECHANIZED CENTRAL APPOINTMENT SYSTEM
AT FITZSIMONS GENERAL HOSPITAL
DENVER, COLORADO

A Problem-Solving Thesis Submitted to the Faculty of Baylor University in Partial Fulfillment of the Requirements for the Degree of
Master of Hospital Administration

by
Major Joseph F. Constable, MSC

August 1972 63 Pages

A copy of this document may be obtained from University Microfilms, University of Michigan, Ann Arbor, Michigan 48108.

The problem was to determine the most effective method of improving the mechanized central appointment system at Fitzsimons General Hospital, Denver, Colorado.

The following methods of research were employed: (1) the author actually worked as an appointment clerk in order to gain a working knowledge of the system; (2) interviews were conducted with patients, physicians, nurses, and other personnel in various clinics throughout the hospital; (3) tests were conducted to determine average time per call, busy signals, and patient waiting time; (4) pertinent data was studied and recorded; (5) a visit was made to Denver General Hospital, Denver, Colorado, where they are revamping their present central appointment system; and (6) current literature was reviewed.

The conclusions demonstrated that the appointment system at Fitzsimons General Hospital was inadequate in meeting the demands of its patients, due primarily to outmoded equipment and an insufficient number of appointment clerks. The main recommendations were that an automatic call distribution system (ACD) should be installed and additional appointment clerks should be hired.