PATIENT APPOINTMENTS AND SCHEDULING

CONDITION-ACTION DIAGRAM
FLOWCHARTS

U.S. ARMY TRIMIS AGENCY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, DC 20012

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Approved for Public Release - Distribution Unlimited

"The views of the author do not purport to reflect the position of the Department of the Army or the Department of Defense."
The purpose of the Patient Appointments and Scheduling (PAS) System condition-action flowcharts is to present in easily understandable graphic form the major processing involved in an advanced clinic appointments system. The PAS System is intended to provide the appointing and scheduling portion of the health care support systems which are the mission of the Tri-Service Medical Information System (TRIMIS) project.
Block #20:

In the face of a wide diversity in clinic appointing operations throughout the military medical departments, the intent of this system is to be relatively comprehensive. Therefore, the TRIMIS PAS Subsystem includes features that may not be implemented at all hospitals or clinics. However, a subset of the system should suffice for any given treatment facility regardless of specialization or work load.

The essence of patient appointments and clinic scheduling as embodied in PAS is to bring together at a specified time and place the three essential elements for a patient-CP encounter - the patient himself, the care provider CP, and the medical record or "data base." Further, this is to be done in such a manner as to aid the clinic chief and unit manager in efficiently managing the clinic, to help in keeping medical records available where and when needed, and to aid the patient and care provider in planning their individual schedules. While this is conceptually rather straightforward, it is pragmatically actually quite complex.

An annotated bibliography is included.
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*These mnemonics are not intended for use as general identifiers, but are used in these charts for indexing and cross-referencing purposes.*
ACKNOWLEDGEMENTS

These charts were developed by Mr. Karl Schank of the TRIMIS-Army Agency, who also did the initial analysis of the then-existing system at Walter Reed Army Medical Center (WRAMC). The design and development of the complete system charted herein was a joint effort participated in by the Army, Navy, and Air Force with technical assistance from a Systems Engineering and Integration Contractor (SE&I). The principal military personnel involved in this effort were: CWO John C. Morris and Mr. Karl Schank, TRIMIS-Army Agency; Mrs. R. Lynne Nearman, Naval Medical Data Services Center; CPT John J. Cleary, Jr. and Mr. J. T. Wright, Air Force Data Systems Design Center. The SE&I was IBM Federal Systems Division.

Many thanks to Mrs. Margot Alessandro of the WRAMC Central Appointments Section, as well as her staff, who allowed us to analyze her system and put up with us when we did. LTC Norman Wallace and MAJ Carl Helser of the WRAMC Department of Clinics also deserve our thanks.
PURPOSE.

The purpose of the Patient Appointments and Scheduling (PAS) System condition-action flowcharts is to present in easily understandable graphic form the major processing involved in an advanced clinic appointments system. The PAS System is intended to provide the appointing and scheduling portion of the health care support systems which are the mission of the Tri-Service Medical Information System (TRIMIS) project.

BACKGROUND.

There is a wide diversity in clinic appointing operations throughout the military medical departments, ranging from individual clinic maintenance of local appointment books, to block-scheduled mass clinics, to individual patients seeing specific care providers in clinics that may be appointed either centrally or locally. The intent of the system is to be relatively comprehensive. As such, it must be flexible enough to be usable for facilities that have a single Centralized Appointment Section (CAS), as well as facilities that in addition to or in lieu of this have a system of decentralized local appointing areas (the clinics) operating throughout the medical facility or region. Further, the system must be usable by MTFs ranging from the small stand-alone medical clinic to the large military medical center with a wide variety of specialty services and/or active teaching program. Therefore, the TRIMIS PAS Subsystem includes features that may not be implemented at all hospitals or
clinics. However, a subset of the system should suffice for any given treatment facility regardless of specialization or workload. In fact, a major portion of the features charted here have recently been manually implemented at the Walter Reed Army Medical Center (WRAMC).

LIMITATIONS.

The reader must not at this time expect to find a hospital Central Appointment Section (CAS), for example, in which the clerks follow exactly all the procedures described herein. This is because the PAS System charted here includes more capabilities than, and is a superset of, any known system at the time of this writing. The system presented here is, in fact, a technology-independent description of the full TRIMIS PAS System design. However, the internal details of routine processes such as production of reports are not presented here, as the condition-action diagram format is an inappropriate medium for that type description.

Although the maintenance of operating room (OR) schedules is one required component of the subsystem that has not yet been adequately addressed, and is not charted here, work has been initiated to complete its definition.

OBJECTIVES.

The essence of patient appointments and clinic scheduling as embodied in PAS is to bring together at a specified time and place the three essential elements for a patient-CP encounter -- the patient
himself, the care provider CP, and the medical record or "database." Further, this is to be done in such a manner as to aid the clinic chief and unit manager in efficiently managing the clinic, to help in keeping medical records available where and when needed, and to aid the patient and care provider in planning their individual schedules. While this seems at first to be rather straightforward, it is actually quite complex and requires a good deal of processing to accomplish.

These PAS processes are visualized as the starting point for patient care encounters and health care management, and it is understood that this initial contact often determines the patient's perception of the entire facility and its staff. Consequently the patient must be treated with tact and respect.

More specific philosophies, policies, and objectives are outlined under the following headings that indicate the major process groups of PAS.

a. **Care Provider Schedule Maintenance Function.**
   1. Satisfy or match patients' unique appointment criteria and desires with clinic/care provider schedules.
   2. Reduce waiting room time.
   3. Reduce patient waiting time for an appointment.
   4. Reduce appointment making time.
   5. Speedily and efficiently provide the means to schedule, locate, summarize, confirm, change, or cancel an individual's appointments.
6. Provide the means to satisfy those patient appointment requirements when clinic or care provider schedules are not currently available.

7. Allow flexibility of scheduling so that appointments can be made for the individual care provider from the clinic and/or the Central Appointments Section.

8. Reduce and resolve appointment conflicts arising from an attempt to create multiple appointments at the same time (in an integrated environment this may involve other subsystems).

9. Insure that in no case is an appointment ever made automatically for an outpatient without her/his active concurrence.

10. Allow for the appointing of every encounter a patient has with a clinic/care provider.

c. Follow-Up Function.

1. Remind patients of confirmed or cancelled appointments (this must not abridge his right to medical privacy).

2. Provide daily lists of scheduled appointments for each clinic session in sufficient time to arrange their delivery to the clinic and practitioner prior to the first scheduled patient's appointment.

3. Provide lists to notify the medical or dental record room and x-ray image library personnel of records required by the clinics in sufficient time to arrange delivery of the patient records to the appropriate clinic prior to the patient's appointment.
4. Provide an accurate method of patient accounting and improved data on the demand for health care services for the clinics or care provider (these statistics may be used as a variety of management reports).

OVERVIEW.

The PAS System is an advanced outpatient appointments system capable of supporting with great flexibility the specialized requirements of subspecialty clinics, and individual care providers practicing in clinics, as well as traditional block-appointed mass clinics. It is a blended centralized/decentralized system offering a significant degree of local clinic control, and local as well as CAS appointing. Hence, nowhere is any distinction, or even any mention, made of CAS as opposed to clinic-located appointing. Facilities are included to handle many of the problems of teaching hospitals, such as the professional staff rotating throughout the hospital. As with any appointments system, medical records delivery to the clinic prior to the appointment is supported. Useful managerial and statistical reports are provided; and because the facilities to handle short lead time appointments and walk-ins are included, workload data may be collected uniformly and completely. In order to reduce no-shows, reminder notices can be mailed to patients. The PAS System charted here offers significant flexibility and capability in care provider schedule maintenance, patient appointing, and follow-up and reporting that may be unavailable with most systems.
EXPECTED BENEFITS INCLUDE:

- Improved local control and responsiveness.
- Single centralized appointment and schedule data base, if ADP supported.
- Uniform and complete workload data collection.
- Greater flexibility and capability.
- Greater clerk knowledge of clinic operations and procedures.
- Automatic record retrieval and roster generation.
- Improved utilization of professional and physical resources.
- Improved patient and professional satisfaction.

SUBSYSTEM INTERFACES

As noted, there are major interfaces to the clinics (W/C) system, and the Patient Administration (PAD) System particularly including the PAD Medical Records Library.

AMENABILITY TO ADP SUPPORT.

The eventual goal is that PAS be an automated system with significant on-line interactive computer support. However, in these flowcharts, the processing is presented only in terms of procedures. Because of this technology-independent approach, the system and the charts are not in any way tied to the use of a computer or any other technology (such as lazy-susan wheels for schedule files), thus enhancing their usefulness. In fact, if workload and resources allow, any or all features of PAS may well be implemented manually by simply following the flowcharts.
ACTION

When an action circle is encountered, the specified action, procedure, function, or process is to be performed as noted. An action is performed and never has a truth (true or false) value.

CONDITION

When a condition box is encountered, the specified condition is to be evaluated. If it holds true or succeeds, the following blocks on the diagram are to be executed. If the condition does not hold, then flow along this path of the diagram stops. The flow may, as appropriate, either be permanently blocked or may merely wait at the box pending the successful evaluation of the condition at some later time. A condition always has a truth (true or false) value.

FLOWLINES

Flow proceeds through the diagram along the flowlines. When a flowline splits into multiple lines, all the lines must be followed (perhaps at once). If only one is intended, condition boxes will be used to select the proper line. When flowlines join or reconsolidate into a single line, that line is to be followed regardless of the number of joining lines that were active. Thus there is no waiting at a junction. Control, execution, or interpretation of the diagram is shown by solid flowlines. Data and information, is usually assumed to accompany control, but where necessary for clarity, it is shown, regardless of media, by dashed lines.
NOTE

Clarifying notes, comments, remarks, and other annotation, including references to additional documentation, are enclosed in dashed note boxes and are connected to the annotated structure by dashed lines.

STORAGE

A triangular storage block indicates storage of information or data regardless of the medium of storage. Thus, only dashed data flow lines, not solid control lines, will connect to storage blocks.

DOCUMENT

A document symbol represents information or data, regardless of media (it may or may not physically reside on a document). It is used only for clarity, as information such as that contained in the "document" is assumed to always be present along with the control flow. Like the storage symbol, only dashed data lines may connect to a document symbol.

CONNECTOR

A connector circle specifies that the flow continues on another page. An out-connector contains a number, which is the sheet number at which the flow is continued, and a letter, which specifies which in-connector on that sheet is being referenced. The in-connector contains the matching number-letter code. Adjacent to the connectors is a notation as to the sheet and process to or from which the connectors refer.
PROCESS

A striped process circle indicates a process to be performed. It is analogous to a high-level or meta-action. The process referenced will be diagrammed in its own set of condition-action flowcharts which are included in the same packet of flowcharts for reference. After the process is performed, flow resumes.

TERMINATOR

The oblong terminator symbol indicates that the current process or sub-process is complete. Normally, upon completion of a process, control returns to the process which invoked it, and resumes where it left off in that process.
Perform Action A first, then in sequence, perform B.

If condition P holds true, then perform Action A. If P does not hold, do not perform A.

If both condition P and condition Q hold true, then perform A. If either one does not hold, then do not perform A.

Same function and same net results as above, but evaluated in a different sequence.

If either condition P holds true, or if condition Q holds true (or both), then perform A. If neither holds true, then do not perform A.

If condition P holds true, then perform Action A but not B. If P does not hold, then perform B but not A. In any case, when done, perform C.
First perform Action C. Then: If condition P holds true, then perform Action A. If condition Q holds true, then perform action B. Note that both P and Q may hold, in which case both A and B will be performed.

First perform Action A, then (in all cases) perform Action B. Additionally, if condition P holds true, then perform Action C (perhaps at the same time as Action B).

Perform Action A utilizing information contained on the document B which was retrieved from the file C.

First perform Action A. Then perform process B, which is itself flowcharted elsewhere in this set of charts. After B is completed, return to here and perform Action C.
ABBREVIATIONS USED IN PAS CHARTS

add'l  additional
appt  appointment
   c  with
CAS  Central Appointments Section
clin  clinic
clk  clerk
corresp  correspondence
CP  Care Provider (physician, dentist, nurse, etc.)
curr  current
det  determine
DF  Disposition Form, DA Form 2496
doc  document
Dx  Diagnosis
Hx  History
incl  including
info  information
lim  limitations
med rec  medical record(s)
mgt  management or managerial
MR  Medical Record(s)
MTF  Medical Treatment Facility (hospital, roughly)
MTRC  Medical Treatment Record Card (patient ID card)
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAD</td>
<td>Patient Administration Subsystem (or Patient Administration Division)</td>
</tr>
<tr>
<td>PAS</td>
<td>Patient Appointments and Scheduling Subsystem (or Patient Appointments Subsystem)</td>
</tr>
<tr>
<td>pblm</td>
<td>problem (patient's medical problem)</td>
</tr>
<tr>
<td>persnl</td>
<td>personnel</td>
</tr>
<tr>
<td>pnt</td>
<td>patient</td>
</tr>
<tr>
<td>POC</td>
<td>Point of Contact</td>
</tr>
<tr>
<td>pri care</td>
<td>primary care</td>
</tr>
<tr>
<td>proc</td>
<td>process</td>
</tr>
<tr>
<td>prod</td>
<td>product or produce</td>
</tr>
<tr>
<td>PTID</td>
<td>Patient Identification</td>
</tr>
<tr>
<td>reg</td>
<td>registration</td>
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<td>registr</td>
<td>registration</td>
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<tr>
<td>rept</td>
<td>report</td>
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<tr>
<td>sched</td>
<td>schedule</td>
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<tr>
<td>sel</td>
<td>selected</td>
</tr>
<tr>
<td>SF</td>
<td>Suspense File (waiting or pending list)</td>
</tr>
<tr>
<td>spec'd</td>
<td>specified</td>
</tr>
<tr>
<td>stat</td>
<td>statistical</td>
</tr>
<tr>
<td>susp</td>
<td>suspense or suspense file</td>
</tr>
<tr>
<td>TRIMIS</td>
<td>Tri-Service Medical Information System. Refers to the system, the project/program, and the organization.</td>
</tr>
<tr>
<td>w/</td>
<td>with</td>
</tr>
<tr>
<td>W/C</td>
<td>Wards and Clinics Subsystem</td>
</tr>
</tbody>
</table>
wkld  workload

WRAMC  Walter Reed Army Medical Center
PAS
PROCESS INVOCATION OVERVIEW

LEGEND

A PROCESS WITH MNEMONIC "NAME" AND PAS SUBSYSTEM NUMBER "n".
PROCESS IS TIME-INITIATED (SCHEDULED).
E PROCESS IS EVENT INITIATED.

SUSPENSE FILE (SF) CODE:
A WAITING LIST SF
B PENDING CP SCHEDULE SF
C RETURN VISIT SF
D LONG LEAD-TIME SF
E CANCELLATION SF

APPOINTMENT SF

SCHEDULE (3)
SCHEDULE MOD (4)
CHECK IN (12)
CLINIC ENCOUNTER
EXIT (13)

CONTACT (1)
FOLLOW-UP (10)

PNT CANCEL (7)
SUSP APPT (8)

APPT (6)

PAD FULL REG
PAR REG (9)
ADD SUSP (2)
INFO (5)

PTID (11)

T,E

A,B,C,E
C,E
A,B,E
A,B,E, C,E
A,B, E
A,B
A,B,D
C,D
C,E
D

T,E

D
A.E
A.E
A.E
CLINIC'S SCHEDULE OR DUE DATE ARRIVES

FROM BELOW

SCHEDULE ARRIVED

CHECK FOR ACCURACY, VALIDITY

NOT OK

CONTACT CLINIC & RESOLVE

OK

REMIND CLINIC PERSONNEL RESPONSIBLE

1A ABOVE

2A TO SHEET 2

CLINIC/CP SCHEDULING PROCESS

PAS

SHEET 1 OF 2 31 OCT 1975
CHANGES ARRIVE IN SYSTEM

CHANGE VIA PHONE OR UNAUTHORIZED PERSON

WRITE (DF) AUTHORIZATION NOT RECEIVED WITHIN 1 WEEK

CONTACT AUTHORIZER & REQUEST DF

PATIENTS IDENTIFIED IN CHECK AS BEING APPOINTED TO CANCELLED SLOTS WILL BE NOTIFIED.

CHANGES INC. ADDITIONS, MODIFICATIONS, DELETIONS

COMPARE CHANGES TO SCHEDULE

POST THE CHANGES (UPDATE)

PATIENTS WERE APPOINTED TO SLOTS THAT WERE CANCELLED

EXTRA SLOTS WERE ADDED AND NON-EMPTY SUSP. FILES EXIST

NO FURTHER CHANGES

PERFORM SUSP. FILE APPT.

2A TO SHEET 2

PROCESS COMPLETE

PROCESS COMPLETE

WAITING LIST, PEND CP—SCHED. & CANCEL SFS (A, B, E)

THESE CONDITIONS WOULD BE IDENTIFIED DURING COMPARISON & POSTING.

THIS CHECK WOULD PROBABLY BE DONE WHILE POSTING CHANGES.

PAS
CLINIC/CP SCHEDULE MODIFICATION PROCESS
SHEET 1 OF 2 3 NOV 1975
APPOINTMENT TO BE ATTEMPTED FOR PATIENT

PATIENT IS (PARTIALLY) REGISTERED

PATIENT IS NOT (PARTIALLY) REGISTERED

PERFORM PARTIAL REG. PROC.

DETERMINE DESIRED CLINIC

CLERK NOT FAMILIAR WITH CLINIC'S PROCEDURES

CLERK FAMILIAR WITH CLINIC

CLINIC NOT KNOWN, CP KNOWN, AND SAID TO RETURN ONLY TO HIM

CLINIC LIMITATION FILE

OBTAIN CLINIC LIMITATIONS, SOP, ETC.

CLINIC SHOULDN'T BE APPOINTED TO BY THIS CLERK

PATIENT & CLERK MEET CLINIC REQUIREMENTS

PATIENT DOES NOT MEET CLINIC REQUIREMENTS

DETERMINE DESIRED CP

TRANSFER PHONE CALL, IF POSSIBLE

REFER PATIENT TO CORRECT P.O.C.

PROCESS COMPLETE

2A TO SHEET 2

2B TO SHEET 2

2D TO SHEET 2

NO STRONG PREFERENCE OR UNKNOWN

CP KNOWN & SAID TO RETURN ONLY TO HIM

IN THE WORKBOOK, THIS IS PART OF THE SCHEDULE FILE. FEATURES OF THE AUTHORIZATION FILES ARE ALSO INCL.
FROM SHEET 3

4A

APPOINTMENT IS TO BE MADE (SLOT IS FOUND)

UPDATE SCHEDULE

INDICATE SLOT IS UNAVAILABLE. SET LINK TO PATIENT & APPT INFO.

CHECK FILES FOR CONFLICTS & CONFIRM WITH PNT

CONFlict PROBLEM, OR SUSP. FILE ENTRY "CLOSE TO" CURRENT APPT.

RESOLVE WITH PATIENT

TO KEEP CURRENT APPOINTMENT, DELETE PREVIOUSLY BOOKED APPOINTMENT

PERFORM PT APPT CANCEL PROC.

TO REMAKE CURRENT APPOINTMENT DUE TO CONFLICT WITH PREV. BOOKED APPT.

REVERSE SCHED. UPDATE

TO DELETE SUSP. FILE ENTRY(S) OBVIATED BY CURR. APPT.

DELETE SUSP. FILE ENTRY

APPROPRIATE SUSPENSE FILE(S)

TO SHEET 5

3B TO SHEET 3

FROM SHEET 2

4B

NO SCHEDULES IN SYSTEM FOR SPECIFIED CP

APPOINTMENT AND SUSPENSE FILES

DESIRED APPT. DATE IS LONG LEAD - TIME IN NATURE

PERFORM ADD TO SUSP. FILE

PROCESS COMPLETE

DESIRED APPT. DATE IS NOT LONG LEAD - TIME

PERFORM ADD TO SUSPENSE FILE

PENDING CP SCHED. S.F. (b)

PROCESS COMPLETE

PAS

APPOINTMENT MAKING PROCESS

SHEET 4 OF 5  3 NOV 1975
FROM SHEET 4

5A

APPOINTMENT CONFIRMED BY PNT -- TO BE FINALIZED

INCLUDING CP-SPECIFIED RETURN VISIT SUSPENSE DATE (RVSD), IF ANY

COLLECT ADD'L INFO FROM PNT AS NEEDED

INCLUDE FULL APPOINTMENT DATA AND LINKS TO PNT DATA & SCHEDULE

CREATE ENTRY IN APPT FILE

INDICATE THAT THE PATIENT HAS AN APPT. (MAY BE IMPLICIT OR TRANSPARENT)

UPDATE PATIENT DIRECTORY

APPOINTMENT FILE

PATIENT DIRECTORY

PROCESS COMPLETE

BOTH ARE SUBSETS OF MASTER PATIENT FILE

PAS

APPOINTMENT MAKING PROCESS

SHEET 5 OF 5  3 NOV 1975
PATIENT HAS REQUESTED APPOINTMENT BE CANCELLED

OBTAIN APPT DATA FROM PNT

GET COMPLETE DATA FROM FILES

CONFIRM WITH PATIENT

APPOINTMENT FILE

A SUBSET OF THE MASTER PATIENT FILE

INCORRECT

OK

RESOLVE WITH PATIENT

REVERT SCHEDULE 1 SLOT TO "AVAILABLE"

SCHEDULE FILE

PROCESS COMPLETE

TO SHEET 2

PATIENT-INITIATED CANCELLATION OF APPOINTMENT PROCESS

SHEET 1 OF 2 3 NOV 1975
FROM SHEET 1

2A

DELETE APPOINTMENT FILE ENTRY

APPOINTMENT FILE

APPOINTMENT HISTORY FILE

STATISTICS FILES

RECORD AS "PATIENT CANCELLED"

NO RETURN VISIT SUSPENSE DATE

RETURN VISIT SUSPENSE DATE HAD BEEN SPEC'D BY CP

PERFORM ADD TO RV SUSP. FILE

PATIENTS ARE LISTED ON SOME SUSP. FILES AS WAITING FOR APPTS.

PERFORM APPROPRIATE SUSPENSE/FILE APPT.

NO WAITING LIST SUSPENSE FILES OF ANY SORT

APPROPRIATE SUSPENSE FILES

PROCESS COMPLETE

PAS
PATIENT-INITIATED CANCELLATION OF APPOINTMENT PROCESS
SHEET 2 OF 2 31 OCT 1975
APPOINTMENT NEEDED FOR PNT ON A SPECIFIED SUSPENSE FILE

SCHEDULE NOT KNOWN TO BE FULL OR UNAVAILABLE

SPECIFIED SUSPENSE FILE NON-EMPTY

OBTAIN PATIENT INFO.

TELEPHONE PATIENT

INFORM PATIENT OF SITUATION

2A

TO SHEET 2

THE SPECIFIC FILE TO BE USED WILL BE INDICATED BY THE PROCESS WHICH INVOKES THIS PROCESS (SEE BELOW).

APPOINTMENT SUSPENSE FILE

SUSPENSE FILES

CANCELLATION (E)

LONG LEAD-TIME (D)

RETURN VISIT (C)

PENDING CP-SCHEDULE (B)

WAITING LIST (A)

PATIENT DIRECTORY

A SUBSET OF THE MASTER PATIENT FILE

E.G., IF CANCELLATION, TELL PNT CLINIC CANCELLED APPT. & OFFER TO MAKE ANOTHER; IF WAITING LISTS OR APPT. SUSP. F., TELL HIM SCHED. IS AVAILABLE, ETC.
FROM SHEET 1

2A

PATIENT NO LONGER WANTS APPOINTMENT

DELETE FROM SPECIFIED SUSP FILE

PROBLEMS EXIST

RESOLVE AS APPROPRIATE

PATIENT DOES WANT APPOINTMENT

PERFORM APPT PROCESS

FTID IS KNOWN FROM FILES, AND PATIENT IS ALREADY PARTIALLY REGISTERED IF ON FILES.

SUSPENSE FILES

THIS TIME IS APPROPRIATE TO CONTACT OTHER PATIENTS

OTHER PATIENTS EXIST ON SUSP FILE(S)

TO SHEET 1

1A

NO MORE PATIENTS TO BE CONTACTED

PROCESS COMPLETE

PAS
SUSPENSE FILE APPOINTMENT PROCESS
SHEET 2 OF 2  31 OCT 1975
PAS
CHECK-IN PROCESS
SHEET 2 OF 2  3 NOV 1975
"FILE" DEPENDENCY SUMMARY

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>FILE</th>
<th>Appt SF*</th>
<th></th>
<th>Master Pnt File</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>FILES</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Waiting List SF*</td>
<td></td>
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<tr>
<td></td>
<td>Pending CP Sched SF</td>
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<td></td>
<td>Return Visit SF</td>
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<td></td>
<td>Long Lead SF *</td>
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<td>Cancellation &amp; related files</td>
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<td></td>
<td>Schedule file &amp; Patient Directory</td>
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<td></td>
<td>Appointment File</td>
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<tr>
<td></td>
<td>Appointments History File</td>
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<td>Statistical Files</td>
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**PROCESS**

1. Contact
2. Add Susp
3. Sched
4. Sched Mod
5. Info
6. Appt
7. Pnt Cancel
8. Susp Appt
9. Par Reg
10. Follow-Up
11. PTID
12. Check-In
13. Exit

**LEGEND**

<table>
<thead>
<tr>
<th>R</th>
<th>Process reads or examines data in file</th>
<th>A</th>
<th>Process appends or inserts records into file</th>
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<tbody>
<tr>
<td>D</td>
<td>Process deletes records from file</td>
<td>U</td>
<td>Process updates or modifies existing records in file</td>
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<tr>
<td>( )</td>
<td>Infrequent occurrence</td>
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### EXTERNAL INTERFACES SUMMARY

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<tr>
<td>1. Contact</td>
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</tr>
<tr>
<td>2. Add Susp</td>
<td>Hard Copy to Clin/CP X</td>
</tr>
<tr>
<td>3. Sched</td>
<td>Hard Copy to Rec Rec X</td>
</tr>
<tr>
<td>4. Sched Mod</td>
<td>Hard Copy From Clin X</td>
</tr>
<tr>
<td>5. Info</td>
<td>Soft Info From Pnt X X X</td>
</tr>
<tr>
<td>6. Appt</td>
<td>PAD Registration Proc X X</td>
</tr>
<tr>
<td>7. Pnt Cancel</td>
<td>Clinic Encounter Proc X X</td>
</tr>
<tr>
<td>8. Susp Appt</td>
<td>X X X X</td>
</tr>
<tr>
<td>9. Par Reg</td>
<td>X X X</td>
</tr>
<tr>
<td>10. Follow-Up</td>
<td>X X X</td>
</tr>
<tr>
<td>11. PTID</td>
<td>X</td>
</tr>
<tr>
<td>12. Check-In</td>
<td>X X X X</td>
</tr>
<tr>
<td>13. Exit</td>
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### INDEX TO PAS CHARTS

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<tr>
<th>Process</th>
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<th>No. Sheets</th>
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<td>Add to Suspense File</td>
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<td>Appointment Making</td>
<td>Appt</td>
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<td>5</td>
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<td>Check-In (PAS Portion)</td>
<td>Check-in</td>
<td>12</td>
<td>2</td>
<td>41</td>
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<td>Clinic/CP Scheduling</td>
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<td>2</td>
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<td>Follow-Up</td>
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<td>Information</td>
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<td>Initial Contact</td>
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<td>Par Reg</td>
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<td>Patient-Initiated Cancellation of Appointment</td>
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*These are not intended for use as general identifiers, but are only for use with these charts for indexing and cross-referencing purposes.*
REFERENCES

1. Tri-Service Medical Information Systems (TRIMIS) Program: 
Integrated Health Care Delivery ADP System Functional Description, 
4 October 1974. (The so-called "Yellow Book.") Particularly of 
relevance to PAS are pages II-35 through II-36, III-8 through 
III-9, IV-4, and IV-29 through IV-37.

2. TRIMIS Technical Workbook. (The so-called "Blue Book.") 
Particularly of interest is Section 10, Patient Scheduling, dated 
9/12/75.

3. Stuart, Richard B. A Study of Appointment Scheduling Control 
for Outpatients. Health Care Study Division Report No. 6, Jan 73. 
Academy of Health Sciences, U.S. Army, Brooke Army Medical Center, 
Fort Sam Houston, Texas 78234.
A SHORT, BRIEFLY ANNOTATED BIBLIOGRAPHY
ON APPOINTMENTS SYSTEMS AND RELATED TOPICS

  (Veterans Administration Hospital, Boston On-line Appointment System. 75,000 patient visits/year, 6,000 patients enrolled.)


• Baron, Robert; Rising, Edward; Averill, Barry; and Los, T. J. "A Computerized Appointment System". College Health, JACHA: 20, 6 (1972 Jun) 344-350.
  (University of Massachusetts Health Service On-line Appointment System. Overview and discussion of costs of manual and computer-based systems. 20,000 to 36,000 patient visits/year, 4 clinics.)

  (On-line Appointments System at Boston Children's Hospital. Includes registration. 150,000 patient visits/year. 54 clinics.)

• Donohue, James; and Brennan, William. "Clinical Scheduling by Computer: The Children's Hospital Medical Center, Boston, Massachusetts". Honeywell Corp.
  (A collection of three papers on the Boston Children's Hospital On-line Appointment System. 150,000 patient visits/year, 54 clinics.)

• Fetter, Robert; and Thompson, John. "Patient Waiting Time and Doctor's Idle Time in the Outpatient Setting", Health Services Research; 1 (1966 Summer) 66-90.


(Waiting list management by patient condition priority)

• Freilich, Herbert. "A Guide to Improved Ambulatory Care Service", Hospital Management; 107 (1967 Mar) (Includes mention of appointments systems in its recommendations.)

• Hoffman, Paul; and Rockart, John. "Implications of the No-Show Rate for Scheduling OPD Appointments", Hospital Progress; 50 8 (1969 Aug) 35-40.

(Includes Implications and effectiveness of computer scheduling.)

• Hoffman, Paul; Rockart, John; and Barnett, G. Octo. "Planning for an Automated Clinic Appointment System", Hospital Topics; 48 10 (1970 Oct) 37-42, 62.

(Self-explanatory. Massachusetts General Hospital. 237,000 patient visits/year, 62 clinics.)


(On-line appointments and registration system. Discusses quantitatively the improvements and response times achieved. 65,000 patients enrolled, 65 clinics.)


(NNMC, Bethesda. 13,000 appointed visits/mo, 70 physicians, 35 clinics. Manual appointments system.)

(On-line Appointments System. Includes registration. 700 patient visits/day, 750,000 patients enrolled, 80,000 patients on-line).

• IBM. "Health Care Support/DL/1 Patient Appointment System", IBM publication GB21-1468. IBM-FDP, Bethesda, MD. 1975. 4 pages.

(Brochure).

• IBM-FSD. "Technical Report on the Functional Characteristics for the Appalachia II Public Health Data System Patient Appointment Scheduling System".


(On-line Appointment System. Discussion includes overview, benefits, actual costs. Peter Bent Brigham Hospital. 55,000 patient visits/year, 7 clinics.)


• Johnson, Walter; and Rosenfeld, Leonard. "Indices of Performance in Ambulatory Care Services", Medical Care; 7 (1969 May/June).

(Appointment Systems are mentioned and suggested. Deals mainly with managerial measures of performance.)


(On-line Airlines Reservation System. Included here for comparison to appointment systems: generally similar.)


(Scheduling methodologies.)


(Statistical parameters of potentially appointed outpatients. E.g., avg. 3 visits per person per year.)


(On-line Appointments Section cited.)


(Manual Appointment System. Puget Sound HMO. 4 clinics, 112,000 members enrolled.)

• Newborn, James. "A Study to Determine the Functions of a Computerized Central Appointment System at Dwight David Eisenhower Army Medical Center, Fort Gordon, Georgia." Baylor University, Waco, TX. 1974. 49 pages. Available as item 13345 OU from Xerox University Microfilms, Ann Arbor, MI.

(Broad overview of On-line Appointment System and discussion of scheduling methodologies. Prospective: not operational. 23,000 patient visits/month, 27 clinics.)
• NNMC. "Central Appointment System". Naval Hospital, National Naval Medical Center, Bethesda, MD. Undated. 16 pages.

(NNMC's manual central appointment system. 492,000 patient visits/year. Includes costs, clerk staffing.)


(Batch computer-assisted central appointment system. Tripler Army Medical Center, HI. Thorough report. 14,000–23,000 patient visits/month, 72–100 clinics.)

• Robinson, Gordon; Wing, Paul; and Davis, Louis. "Computer Simulation of Hospital Patient Scheduling Systems", Health Services Research; 3 (1968 Summer) 130–141.

(Including adaptation and conversion of simulation into computer scheduling system.)


(Lahey clinic, Boston.)


(Individual patient appointments are best.)


(Primarily ambulatory care. Mentions the importance of appointments. Includes much on relevant statistics.)
• Shmarak, Kenneth. "Reduce Your Broken Appointment Rate: How One Children and Youth Project Reduced Its Broken Appointment Rate", AUPH; 61, 12 (1971 Dec) 2,400-2,404.

(Call the patient. Mail a reminder. Follow-up no-shows.)


(One-at-a-time vs two-at-a-time.)


• Stimson, David; and Stimson, Ruth. "Scheduling in Outpatient Clinics", in Operations Research in Hospitals: Diagnosis and Prognosis. Hospital Research and Education Trust, Chicago, IL, 1972. 6-9.

(Discussion of scheduling methods and writing time.)


(Very thorough and complete study of manual appointments systems. Incl. survey of 15 hospitals as well as brief literature review and recommendations.)


(Overview of design of on-line appointments subsystem. Prospective: not operational.)

• USA HSC. "A Central Appointment System: An Aid for Innovation". APC Model #1. USA Health Services Command, Ft. Sam Houston, TX. July 1974.

(Overview and recommendations for manual central appointment systems.)

(Complete and comprehensive description of OASIS.)

• Vanderzee, Peter. "A Systems Study of the Central Appointment System at Walter Reed General Hospital". Texas A&M University, College Station, TX. 1972. 150 pages.

(Self-explanatory. Thorough. 13 clinics in system of 40 clinics total hospital. 11,180 appointed visits/month).


(A manual central appointment system. 1,000 patient visits/day.).

• Welch, J. D. and Bailey, Norman. "Appointment Systems in Hospital Outpatient Departments", Lancet; 1 (1952 May 31) 1,105-1,108


(Discussion of on-line appointments systems at Kaiser-Permenente, Lahey Clinic, Boston Children's and Peter Bent Brigham, as well as optimal scheduling methodologies. Incl. some response times and costs.)

• Williams, William; Covert, Richard; and Steele, James. "Simulation Modeling of a Teaching Hospital Outpatient Clinic", Hospitals, JAHA; 41 (1967 Nov) 71-75, 128.

• WONCA. International Classification of Health Care Problems on Primary Care. World Organization of National Colleges, Academies, and Academic Associations of General Practitioners/Family Physicians. Available from AHA. p. 3-4.

("The majority of visits entail fewer than three health problems; seldom will a visit entail six problems. *** the average may be a little less than 1.5 problems per contact." A statistical parameter related to appointments.).

* Un-annotated citations are considered self-explanatory by their title.
ADDENDUM:

- Singer, Mark; Rossfeld, John; and Van Hall, Michael. "Centralized Appointment System Reduces Patients' Waiting Time", Hospitals, JAHA; 50 (1976 Mar 16) 151-158.

(Received too late to review.)