ABSTRACT

This program handles the major bookkeeping chores of a dental office, including the posting of charges, payments and adjustments to individual patient accounts as well as to a daily log of transactions. It keeps totals and balances on the daily log and an ending balance on the patient account. It also prepares monthly statements for each patient.
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INTRODUCTION

A dental office which uses a manual procedure for bookkeeping is, of course, subject to human error. One error in posting a charge can lead to further errors in figuring totals and billing patients. If left unchecked, this could cause more complications by frustrating accountants at tax time and causing dissatisfied patients at billing time.

Typically, when a patient goes to the dentist, the charges incurred are posted to his "ledger card". A bookkeeper then posts the charges for his visit to a daily log of transactions or "daysheet". This daysheet is totaled and balanced at the end of each day. If the patient makes a payment before leaving the office it is posted to both the ledger card and the daysheet. Otherwise, a statement is mailed to him at the end of the month showing the charges, adjustments, payments and ending balance. When he mails a payment, it is posted to his ledger card and the daysheet. In the event of an error or question concerning his statement, he would most likely call the office. The bookkeeper would have to put down the phone and locate his file, assuming it was filed in the proper place. The bookkeeper would then correct the error and hope it had not caused any ill feelings for the patient.

This project is an attempt to alleviate the errors in posting and inconsistencies between the transactions posted to the patient ledger and the daysheet. First, it does the file management of a data base of patients, including adding, deleting and changing a master "Index Ledger" file containing names and recall dates of all responsible billing persons (i.e., not all patients, as there may be more than one patient per family). This portion of the program uses a Shell sort to order the index. This Index Ledger serves as a directory with a one-to-

1
one correspondence between each entry and its respective Ledger file. (1)

Secondly, the "Post Transaction" section of the program opens the patient Ledger file (named by the patient's last name plus three initials). A charge, payment or adjustment is posted and the balance is computed and saved.

The third major portion of the program posts each transaction to the daysheet after it is posted to the ledger file, and computes daily, monthly and yearly totals and balances.

In addition, the program can print the Master Ledger Index, the daysheet and the ledger files in statement form.

The three file types used, Index File, Ledger File and Daysheet File are all opened as random files to allow for speed and ease in making changes. (2,3,5)
LOGICAL DESIGN

The logical design of this project is shown in Figure 1. A transaction is initiated by a patient making an appointment, or a payment. In the case of a patient making an appointment, a charge is posted (to increase the balance of receivables), whereas a payment is posted as a credit (decreasing the balance).

The transaction is then posted to a patient's ledger file along with charges incurred by other family members.

The daysheet file is opened simultaneously and the transaction is posted there as well. Totals and balances are computed with each entry to provide current totals.

Additionally, the patient's ledger file is used to output a statement, and the daysheet report is produced from the daysheet file.
FILE STRUCTURE

The file structure of each file type is shown in Figures 2, 3 and 4. The Ledger Index File, or Ledger.NDX, as it is referred to in the program, contains last name, first name, middle initial and recall date. The Figures show field lengths and the one letter identifier used. (IBM DOS 2.1 only allows single letter identifiers in the Field definition statement.)

A Patient Ledger File exists for each family and is named by the last name plus three initials (e.g. SMITH.JGS). It contains three record types. Record 1 stores name, address and phone number. Record 2 holds miscellaneous billing and identification information, such as recall date, insurance company, employer, social security number, bank and driver's license number. Record type 3 stores the transaction information: date, patient name, procedure performed, charge, payment, adjustment and outstanding balance. The third file type, Daysheet file holds two record types. Records 1-3 store total amounts for charges, payments, adjustments and balances. Record 1 contains year-to-date totals; Record 2 contains month-to-date totals; and Record 3 contains daily totals. The other record type holds individual transactions for the day and begins with Record 4. It stores last name, patient name, procedure, charge, payment, adjustment and balance. It is similar to the transaction record for the Patient Ledger File in that it holds patient name, procedure and charge. The balance will differ, however, as the Daysheet balance reflects all patient accounts.
There is one Ledger Index File containing the name and recall date for each billed patient or family.
There is one Patient Ledger File for each billed patient or family. It contains three record types: (1) Address, (2) Billing Information, and (3) Transactions.
There may be 365 Daysheet (Month.Day) Files with the extension being the day of the month. The format of the transactions is similar to the transactions of the Patient Ledger File. In addition, it holds daily, monthly and yearly totals.
MENUS

This is a menu-driven program as can be seen in Figures 5-8. The Main Menu, Figure 5, displays 4 routines and an Exit from the program. A selection of 1,2 or 3, for Master Index Ledger, Post Transaction or Daysheet routines also brings up a menu. They are shown in Figures 6,7 and 8 respectively. The menu is analogous to a table of contents--the user makes a choice from the menu and returns to it upon completion of the routine. It is possible to return to the main menu from each "sub-menu". The Bill Patient routine on the Main Menu requires no further choices so there is no "sub-menu" for this routine. The Exit merely closes any open files and returns the user to Basic command level.
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MENU

1. MASTER INDEX LEDGER
2. POST TRANSACTION
3. DAYSHEET
4. BILL PATIENT
5. EXIT

REQUEST DESIRED PROCEDURE (1-5) 1

FIGURE 5
MASTER INDEX LEDGER

1. ADD PATIENT TO INDEX LEDGER
2. CHANGE NAME OR RECALL DATE
3. OPEN AND INPUT BILLING INFO
4. CHANGE BILLING INFO
5. DELETE PATIENT
6. DISPLAY LIST OF PATIENTS
7. RETURN TO MAIN MENU

INPUT DESIRED NUMBER (1-7) 1
POST TRANSACTION

INPUT FILE NAME (e.g., SMITH.JGS):
BOXIFACE.JMB

TODAY'S DATE: DECEMBER 7, 1984

IS THIS A: 1. PROCEDURE
2. PAYMENT
3. ADJUSTMENT
4. DISPLAY FILE
5. RETURN TO MAIN MENU

INPUT (1-5) 1

FIGURE 7
DAYSHEET

1. INITIALIZE NEW DAYSHEET
2. CORRECTIONS
3. DISPLAY DAYSHEET
4. RETURN TO MAIN MENU

INPUT DESIRED NUMBER (1-4) 1

FIGURE 8
PHYSICAL DESIGN

The physical design is represented by flowcharts beginning on page 16. Flowchart 0 is the top-level of the program. It indicates the four major subroutines contained in the program. (actually, the Bill Patient subroutine is not a major routine since it is basically nothing more than a printout of the Patient Ledger File which is opened for posting in subroutine #2.)

The flowcharts are fairly self-explanatory, however, a general discussion here of some of the logic might be helpful. Two arrays are dimensioned at the beginning of the program for use in the event that a patient's name is added, deleted or changed on the Master Index Ledger File and the file must be re-sorted. The Sort routine sorts the array and re-writes it to the file so the file holds a sorted index at all times. A string array contains the patient name and a numeric array contains his recall date. When adding several patients at once, their names are first added to the Index Ledger File and sorted. The user is then prompted as to whether he wishes to open the Patient Ledger files and input the billing information at that time. If not, he is returned to the menu.

Once a Patient file has been opened in the Master Index Ledger Routine (#1), a transaction can be posted to that file in the Post Transaction Routine (#2). After the transaction is posted, the Daysheet File is opened and the transaction is posted there as well. A listing of the Patient Ledger Files by actual filename can be viewed by the DIR command of the operating system, whereas the Index Ledger file shows the entire patient name.

The Daysheet Routine should be called at the beginning of each day to initialize the Daysheet for that day.
The user is prompted for the last working day and that Daysheet file is opened so the year-to-date and month-to-date totals may be stored in Records 1 and 2 of the new Daysheet, with Record 3 initialized to zeros. Subsequent transactions throughout the day produce the daily totals.
BILL PATIENT ROUTINE

FOR I = 1 to N

OPEN LEDGER.NDX

OPEN PATIENT LEDGER FILE

PRINT STATEMENT

CLOSE PATIENT FILE

CLOSE LEDGER.NDX

RETURN

FLOWCHART 4
SUMMARY AND CONCLUSIONS

The utilization of this program in a dental office should result in increased efficiency and time available for other office chores. The potential for human error will be substantially decreased. The scenario set forth in the Introduction should become one of an efficient, smoothly run office. As a patient comes in for an appointment, his charges can be posted to both his file and the Daysheet file within a matter of seconds. Any payments can likewise be posted promptly. If a patient calls with a question about his bill, the bookkeeper can access his Patient Ledger file immediately. At the end of the day, the bookkeeper need only run off a copy of the daysheet and backup copies of the disk files rather than spending precious time trying to balance the daysheet. Such increased efficiency will undoubtedly result in satisfied clerical workers and a more pleasant office atmosphere.

Further work on this project could begin with a recall list which provides the names and addresses of patients to be mailed reminder cards for checkups.

In the area of collections on past due accounts, records could be kept on patients whose accounts are 30, 60 and 90 days late. Names and addresses could be output and reminder letters produced or names and phone numbers could be generated for reminder calls.

An additional program could be added to maintain an appointment calendar which would show time slots available within certain dates. It would then "post" appointments at the selected time.
BIBLIOGRAPHY


