



Education Module for Health Record Practice

Module 6 - Hospital Health Record Computer Applications

The development of automated patient information services to enable the efficient retrieval of information for patient care, statistics, research and teaching is the aim of many hospitals today. The development and implementation of such a system requires detailed planning and co-operation between the health record officer, the computer staff and the hospital administration. In this unit we will:

- . identify the operations within the health record service to be computerised, and
- . identify the priority for implementation

OBJECTIVES:

At the conclusion of this unit participants should be able to:

1. identify seven applications within a health record department which could be considered for computerisation
2. discuss the important points relating to a computerised PMI
3. state the objectives of a computerised admission, transfer and discharge system (ATD)
4. list the daily reports generated by a computerised ATD system
5. name four files in a computerised disease index

COMPUTER APPLICATIONS:

The following applications relating to health record services could be considered for computerisation.

- A. Patients' master index (PMI)
- B. Admission, transfer and discharge/death system (ATD)
- C. Disease and procedure index

In addition to the applications listed above the following additional applications could also be considered when the above systems are running smoothly.

- . Record location/tracking system

- . Outpatient appointment scheduling system
- . Health record completion system
- . Discharge summary abstracting system

In this unit we will discuss the first three applications. It is important to note that the points raised in this unit are suggestions for discussion, and not a definitive outline of specifications. Final specifications for any computer system should be developed in conjunction with the computer programmer, systems analyst, hospital administrator, and health record officer, at a time when the actual type of computer has been determined.

A. THE PATIENTS' MASTER INDEX (PMI)

1. This system would require a group of programmes which would be accessed by users via display terminals and or printing terminals. The programmes would be designed to enable access to the information held on the PMI file, and to build or modify the file information, as required by the hospital.

As discussed in Unit 2, the patients' master index holds information on all patients who have attended or have been admitted to a hospital. Remember, clinical details are NOT held on this file, only basic information required to IDENTIFY the patient.

As with a manual file a computerised file would be cumulative. That is, new patients would be continually added to the file. However, previous patients are NOT deleted as their details are kept available for future attendance or admission or for any other need to retrieve a patient's health record.

2. A computerised PMI system should consist of a master file containing patient details, together with the computer programmes, which allow access to the patient information on the file. The information in the master file is generally referred to as the "PATIENT'S RECORD" and is accessed directly via the following:
 - . Patient's full name
 - . Patient's family name only
 - . Patient's hospital number
 - . Specifically designated identification data, for example, national identification number

This master file would be developed over a period of time through:

- a) entry of information already held on index cards from the manual card system
- b) inpatient registration
- c) outpatient registration.

The entry of new patients should be completed at the time they are registered as outpatients or admitted as inpatients. The file indexes should be updated at the same time so that the information about a new patient is immediately available. Information on existing patients should also be updated on attendance so that recent admissions, changes of address, etc., are readily available on the 'PATIENTS' RECORD'. The system should log every alteration to the patients' master file as a record of what was changed, when and by whom.

Computer Output Microfiche (COM) or paper printout is generated as a backup system.

3. Search programme

A search programme should enable the operator to locate a particular patient to determine if that patient has a registration number. Limited information on a number of patients (one patient per line) may be displayed on a screen for review or further action. These can be displayed by:

- a) Patient name giving hospital number
- b) Hospital number giving patient name

When the particular person is identified the full index file information for that selected patient may be displayed on the screen.

When retrieving information, strict security codes should be used to prevent unauthorised access and alterations. Each user should have his/her own user name as well as a password which is assigned by the computer manager and changed periodically.

Only an authorised user should be able to access information relating to a patient and to change, add to, or delete records on the master file.

4. To operate a patients' master index system the following steps may be used:

- a) The user logs on to the system using his/her name and password. The programme should have its own check on who has authorised access to the patient information verifying the user's name and PMI password.
- b) The user starts the PMI programme
- c) If the entered name and password are valid, a display of the screen (with blank fields) is obtained and the user is then asked which function is required. The types of functions may include:

FIND	DELETE	UPDATE	EXIT OR QUIT
LIST	TAG	ADD	MASS ENTRY

When a function has been selected, the appropriate screen is displayed and the programme will enter that mode of operation. A full outline of each

function should be prepared following the development of the programme.

It is generally recommended that the terminal screen display be in the same format as the identification section on the front sheet of the health record. This would allow for ease of data entry.

5. Before planning such a system, however, many administrative decisions must be made. Two important ones are:
 - a) available funds
 - b) type and size of computers available to meet the needs within the funds available

IF A DECISION IS MADE TO INTRODUCE A COMPUTER SYSTEM FOR PATIENT INFORMATION SERVICES, THE PATIENTS' MASTER INDEX SHOULD BE THE FIRST PROGRAMME IMPLEMENTED.

B. ADMISSIONS, TRANSFER AND DISCHARGES/DEATH (ATD)

The introduction of this type of system would enable staff to maintain a file on all patients currently in hospital, awaiting admission and recently discharged. It would also enable users around the hospital to have direct access (via a terminal) to the file and would automatically generate bed census and other daily statistics required by the hospital administration.

The objectives of such a system would be to:

- . provide an inpatient booking service for patients awaiting admission
- . keep records of the bed state and bed allocation
- . trace patients for enquiries
- . provide daily patient census reports and related statistics
- . provide information for the patients' master index (directly linked to the PMI system)
- . provide a complete data base for all users of patient identification and location information.

Within such a system a data file could be maintained on all patients:

- . currently in hospital
- . awaiting admission
- . recently discharged.

A broad outline of a possible system follows:

NB. DATA RELATING TO ALL PATIENTS CURRENTLY IN HOSPITAL (AT THE TIME

OF THE IMPLEMENTATION OF THE COMPUTER SYSTEM), SHOULD BE ENTERED THE DAY PRIOR TO COMMENCEMENT.

1. Bookings for hospital admissions

An appointment is made with the admission office and patient details are recorded on the appropriate form. This information is then keyed into the system via a visual display unit (VDU). A check (via the computerised PMI) is made to see if the patient has been in hospital. If he/she has, the hospital number is recorded in the patient's booking file. If the patient has not been in hospital previously, the space for the hospital number is left blank until the time of admission.

An admission date will be allocated automatically unless the date has already been noted and recorded. (Consultation with medical staff will be required before this section of the programme can be developed, as admission policies require determination). The booking file will be checked each day for the following week to enable patients to be notified of their admission date and time.

2. Admissions

a) Booked patients

When a patient who has a file in the "booked admissions" file, arrives for admission, the clerk raises the patient's booking information. He/she proceeds to complete the patient identification information in the computer and allocates a hospital number if the patient has not been in hospital or attended the outpatient department (OPD) previously. The same information is recorded on the front sheet of the patient's health record.

The patient is sent to the ward and the appropriate departments notified of the admission, e.g. finance, health records, catering etc.

b) Non-booked and emergency patients

Patients not previously booked in for admission are either interviewed in the admission office or emergency department. Patient identification information is recorded on the front sheet of the health record and immediately keyed into the computer via the terminal in the admission office or emergency room. The PMI is checked for previous admissions. If the patient has a hospital number, this is keyed in, if not a new number is issued.

3. Transfers

If a patient is transferred from one ward to another the staff in health records are to be notified immediately (by phone) to enable them to make the necessary change in the computer file.

4. Discharges/Deaths

If a patient is discharged or dies, the nursing staff must notify the health record staff or discharge office, to enable the computer file to be updated. Date and time of discharge or death is then recorded by the terminal operator.

5. Daily Reports

a) Condition and nursing dependency

Each afternoon the computer operator should print a ward list for each ward. These can then be distributed to the wards where errors or any change of condition will be noted. The nursing dependency for each patient can also be noted at this time. This printout is then used for the daily bed census and should be returned to the Central Admission area at a designated time each day to enable the keyboard operator to amend the files accordingly.

b) Admission and discharge list

A daily list of all admissions and discharges for the previous 24 hours can be generated by the computer (via a printer) the following morning. This is required by the health record and finance departments for their daily operations.

c) Service analysis statistics

On receipt of the health record the health record staff should complete a service analysis on the record and record the information on the discharge list. This will then be keyed into the system by the operator to enable a break down of clinical services to be prepared for the administration.

d) Other statistical information

Information regarding post-operative deaths, autopsies and coroner's cases, plus obstetric information such as deliveries, multiple births, fetal deaths, infant deaths, are also keyed in at this time if not already recorded on file.

e) Suggested daily reports

<u>Name</u>	<u>Contents</u>	<u>Distribution</u>
. <u>Ward Bed Census</u>	Record Number Name Condition Nursing dependency Total beds occupied (male) (female) Beds available (male) (female)	. To all wards . Admission office . Enquiries
. <u>Admission List</u>	Record Number Name Ward Age Doctor	. Health records . Finance . Deputy Director (clinical) . Enquiries
. <u>Discharge List</u>	Record Number Name Ward Status (alive/died) Service	. Health records . Finance . Deputy Director (clinical) . Enquiries
. <u>Transfer List</u>	Record Number Name Ward from Ward to Admission date	. Health records . Finance . Deputy Director (clinical) . Enquiries
. <u>Daily Statistical Return</u>	Ward totals for: Admissions Transfers in Transfers out Discharges Deaths Cumulative monthly Bed days/patient days	. Health records . Deputy
Director (clinical)		
. <u>Planned Admission List</u> (for each ward)	Record Number (if known) Name Sex Planned ward Presenting problem Planned operation Doctor Urgency	. Wards . Health records . Deputy Director . Doctor . Nursing office

admissions	. <u>Waiting List</u>	As above	. Central
Deputy Director			.
Nursing office			.
Doctors			.

f) Monthly Reports

- . Hospital service analysis

Contents

Distribution

Patients in hospital last day of previous month	. Director
Patients admitted during month	. Deputy Director (clinical)
Patients discharged this month	. Patient Care Committee
Total patients in hospital last day this month	
Total patients discharged over 12 years of age/or age which separates paediatrics from adults	
Total patients discharged under 12 years of age/or age which separates paediatrics from adults	
Total number of operations performed	
Total for each clinical service -	
Discharged/Died	
Autopsies	
Coroner's Cases	
Average length of stay	
Average daily census	
Hospital death rate	
Turnover interval	
Net autopsy rate	
Percentage of occupancy	
Stillbirth (fetal death) rate	
Maternal death rate	
Demographic area	

6. As a future plan a 'Health record Completion Programme' could be developed as a subsystem of the ATD system. This would enable the health record staff to maintain up to date information on the status of incomplete health records. The type of information maintained would include:
- . has the health record been returned to the MRD
 - . is the record complete. That is, has the front sheet been signed and dated and has the discharge summary been completed
 - . has the record been signed by the senior medical officer

- . has the coding been completed by the health record officer
- . have other functions such as indexing and statistical collections been completed.

C. DISEASE AND PROCEDURE INDEX

The third possible application to be discussed in this unit is the disease and procedure index. Although this system would be self-contained it would also be part of the full set of systems relating to patient administration and information services.

A computerised disease and procedure index should be developed to enable the research role of a hospital to be carried out. This system could contain information relating to diagnoses and procedures, in coded form, to enable the retrieval of individual cases for research. It could use the ATD system as the base records to which disease and procedure codes are added following the completion of the health record at discharge or death of a patient.

This system could also accommodate information relating to tests performed during hospitalisation for later review of the utilisation of hospital services.

This proposed programme would process the "discharge" area of the ATD master file. In such a system, relevant records in the discharge area are accessed. A specific time limit, however, should be determined regarding transfer from the discharge area to the disease/procedure index. Seven days is the suggested minimum transfer time.

1. Coding

The principal diagnosis and procedure is coded by the health record officer or person given this responsibility and the diagnosis/procedure and code numbers are entered into each individual patient's admission record via a terminal.

2. Retrieval

Such a system could be designed to enable the retrieval and report generation of information on the types of diseases/ procedures treated at a hospital. It should enable retrieval by:

- . Disease/procedure/sex/age/doctor/associated diseases, and hospital number

The system could have four files:

- and
- . Tables master file - containing the ICD9 diseases and ICPM procedure codes rubrics (or relevant classification systems in use)
 - . Episode master file - containing details of each inpatient episode (admission episode)
 - Health records user file - containing users' names, passwords and type
 - Doctor master file - containing file name of all attending doctors

SUMMARY:

The above outline has been prepared as an indication of some initial computer applications relating to patient information services of a hospital. Specifications for such a system should be developed following discussions with the computer planning team at a time when a decision has been made as to type and capacity of the computer to be installed.

Alternatively, numerous commercial computer software programmes for health record/health information services are available and health record officers are advised to seek further information from literature and computer firms.

REFERENCES:

1. Huffman, E.K. (1994). Health Information Management (10th ed). Berwyn, Illinois: Physician's Record Company.
2. Waters, K.A. & Murphy, G.F. (1983). System Analysis & Computer Applications in Health Information Management. Maryland: Aspen Systems Corp.→

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