SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY

Thiruvananthapuram – 695011

SUMMARY OF PROCEDURES DONE

WORK BOOK

NAME : NAJIYA OLAKARA

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SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY

(An Institute of National Importance under Govt. of India)

Thiruvananthapuram – 695 011, Kerala, India

Certificate

This is to certify that this is the bonafide workbook of Medical records Science undertaken by NAJIYA OLAKARA in partial fulfillment of the requirements for the award of Diploma in Medical Records Science.

Place: Thiruvananthapuram ***Signature:***

Date: ***Head of the Department***

PREFACE

This workbook, I have done as a part of my training in the Medical Record Department for the Diploma in Medical records science (DMRS) course at SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY. Through this book, I would like to present some details about medical records, its value, organization and administration of medical records department and its functions.

DMRSc is a two years full time residential programme for graduate in biology or statistics. Selection is done through national level entrance examination followed by interview and medical examination. At present the institute offers only two seats. The aim of this course is to prepare well-qualified personnel to handle medical records and thereby help to improve the quality of medical care that we are providing.

Our syllabus includes subjects like Anatomy and Physiology, Medical Terminology, Medical Coding, Medical Record Science, Biostatistics and Computer science and Hospital Administration. The course schedule consists of theory classes and practical training. Diploma is awarded after the written test and viva-voce, conducted at the end of the second year.

ACKNOWLEDGEMENT

First of all I would like to thank Senior Medical Records Officer & Head of the Department, Medical Records Department, Sri. **N.G.Thampi** who has been our tutor and instructor. He had given proper guidance to each and every aspect of my training. I would also thank to Sri **Jeyaraj**, assistant medical records officer and Sri **P.J.Varghese**, Medical Records Officer.

I thank the Director of the institute **Dr. Asha Kishore**, Medical Superintendent **Dr. Sarada C**, Dean **Dr. Suresh Nair** and Registrar **Dr. A.V. George**, for their advice and kind attention towards me. I extend my thanks to all Staff members of Medical Records Department for their help during my training period in this institute.

Finally, I would like to acknowledge my sincere thanks to my seniors and juniors for their co-operation in the work places and in the studies.

Najiya Olakara

DECLARATION

I hereby declare that I have actually performed all the procedures in this work book during my course and this book has not been submitted in any, whole or part for awarding another degree or diploma at any other university or institution of higher education.

Place: Thiruvananthapuram Najiya Olakara

Date:

ABOUT OUR INSTITUTION

Sree Chitra Thirunal Institute for Medical Science and Technology, Thiruvananthapuram is an institute of national importance under Department of Science and Technology, Government of India. The Institute is empowered to grand medical degrees, diplomas and other such distinctions. Such titles are recognized to the Indian Medical Council Act in 1956 as per circular MCI-24 (1) 8-med (491) dated 11 may 1998. It is one of the common wealth universities in India. This Institute has connection with World Health Organization also.

The Institute is established with the great help from royal family of Travancore and Govt. of Kerala. This Institute has a hospital wing has 253 beds and serves as a tertiary referral center providing advanced facilities for cardio-thoracic and neurological disease. A bio-medical technology wing is situated in Poojappura, aimed to promote bio-medical technology research. The research wing co-operates with various companies and agencies and makes various types of biomaterials. A center for public health science studies is working near to the hospital complex.

The institute offers postdoctoral, doctoral and postgraduate courses in medical specialties, public health, nursing, basic science and health care technology. It is a member of the association of Indian universities and association of commonwealth universities.

CONTENTS

Medical records

Definition

Medical record is the systematic documentation of a single patient's medical history and care, which is clear, concise and accurate across time within one particular health care provider's jurisdiction. Medical record includes a variety of types of notes entered overtime by health care professionals, recording observations and administration of drugs and therapies, orders for administration of drugs and therapies, test results, x-rays, reports etc.

According to Edna K Huffman, medical record is a compilation of pertinent facts of a patient's life and health history, including past and present illness and treatments, written by health professionals contributing to that patient's care.

Dr. McGibbony defined medical record as a clinical, scientific, administrative and legal document relating to patient's care in which recorded sufficient data written in sequence of events to justify the diagnosis and warrant the treatment and end results.

Kipling Stalwaarts defined medical record as who, what, why, when and how of patient's care during hospitalization.

Purpose

Main purpose of the medical record is accurately and adequately, document a patient's life and health history, including past and present illness and treatment, with emphasis on the events affecting the patient during the current episode of care.

Ownership

The medical record developed in the hospital, clinic, and other health care facility or under its auspices considered the physical property of that facility. The information contained therein, however, is the property of the patient and thus must be available to the patient and/or his legally designated representative upon appropriate request

Uses

The document compiled as the medical record contains a wealth of information and has many uses, both personal and impersonal, e.g. insurance claim. Personal use refers to usage in which the identity of the patient, is retained and is necessary. Impersonal use refers to the usage in which the identity of the patient, is not retained and is not necessary, e.g. research project.

The medical record used in a no. of ways:

- *Patient care management*
  a. To document the course of the patient's illness and treatment during each episode of care
  b. To communicate between the physician and other health professionals providing care to the patient
  c. To inform health professionals providing subsequent care
- *Quality review*
  As a basis for evaluating the adequacy and appropriateness of care
- *Financial reimbursement*
  To substantiate insurance claims of the health facility and patient
- *Legal affairs*
  To provide data to assist in protecting the legal interest of the patient, the physician, and the health care facility
- *Education*
  Provides actual case studies for the education of health professionals
- *Research*
  Provides data to expand the body of medical knowledge
- *Public health*
  Identifies disease incidence so plans, can be formulated to improve the overall health of the nation and world

Values

A good medical record is valuable to many users

- To the patient
  - Continuity of medical care in case of re-visits.
  - Avoid the repetition of investigations.
  - Saving the expenditure
  - For the purpose of certificates
  - Legal safe guard to patients
- To The Doctor:
  - To continue the treatment
  - Evaluation or results of new drugs, treatment etc
  - Compare the results with similar results obtained throughout.
- To the hospital :
  - To justify the results of the treatments and patient care

- Serves as a measuring instrument for judging the quality and quantity of work done by Doctor, Nurses and paramedical staff
- For medico-legal purpose
- For statistical purpose and planning of services, budget, staff and equipment

❖ For health authorities:

- Complete statistical data on disease from discharge records and out-Patient record

1. District health services (state level)
2. Director General of Health Services (national)
3. World Health Organization (international)

- Control infectious disease and epidemics.

❖ For research purpose

❖ For use of third party agencies

Responsibility for medical records

The medical record is the property of the health care facility and maintained for the benefit of the patient, doctor, and the facility. It is the responsibility of the facility to provide a record for each patient and safeguard the record and its content against loss, damage, tampering, and unauthorized use. It varies with the policy of management of health care facility.

- Hospital administration:

  The administration of hospital ensuring that, the medical staff adopts rules and regulations providing for maintenance of timely complete maintenance of medical records.

- Medical Records committee:

  The major function of this committee is to change the form and formats of a medical record if necessary. Attention should direct towards the improvement of patient care documentation. Insuring that, there is proper filing, indexing, storage and availability of medical records.

- The physician:
  The major responsibility for an adequate medical record lies with the physician who assumes the final responsibility for its completion and

accuracy. Recording of information like history, physical examination, discharge summary etc. written by interns, residents and other house staff must reviewed, corrected and countersigned by attending physician.

- The Medical Record Personnel:

  The medical record practitioner works with medical staff for good medical records and checks the quantitative review of records. The medical record personnel assist the physician in reviewing the record and select appropriate coding and indexing system for retrieval of data.

Content and format

Forms

There are certain basic forms, which must be included in the medical record of the patient. These forms are necessary in the majority of the records regardless of the patient.

Basic forms:

- **Out patient record:** It contains outpatient form and patient follower in chronological order. Then investigations such as lab report, ECG, EEG and other diagnostic investigation reports and correspondence.
- **In patient record:** Following is a typical arrangement for permanent filing.

1. **Admission record:** This form also called the social history record, the social data record, identification sheet or face sheet. The upper portion contains information of identification nature and lower section contains summary of discharge data.

   The admitting diagnosis is a vital part of this admission record. It serves as a basic of examination and treatment. It is useful in determining the room assignment in the hospitals with specialized patient care service. It also necessary in order that the intern, resident and nurse will have the information needed to start caring for the patient.

   The lower portion of the admission record is completed by the physician at the time of patient is discharged. The final diagnosis is a statement of opinion arrived at after extensive study. The admission record provide data such as consultation, autopsy perform, presence of institutional infection, allergies and sensitivities.

   The attending physician responsible for completeness of medical record and should sign on the admission sheet. This indicate that he accepts the responsibilities for the scientific and medico-legal content of the medical record thereby fulfilling him obligation to the patient, the hospital and himself.

   The back of the admission record is useful for the admission consent form. It is signed upon the patient's admission to the hospital as part of the admission procedure. This provides a record of consent of a routine services, diagnostic procedure and medical treatment.

2. **Case summary and Discharge summary:** This is a brief note of the entire medical record of a patient. It is valuable aid for the attending physician on re-admission of a patient or follow-up treatment at the OPD. The discharge summary should be containing essential information regarding the patient's illness, investigation and treatment. It is usually file immediately under the face sheet. The attending physician should sign the discharge summary sheet. The discharge summary is used to make photocopies to send to insurance companies or other purpose, thus saving the time of making the abstract. A copy is kept in the outpatient record for easy reference when patient reports for follow-up treatment. A copy may be sent to the referring physician or consultant for his official records. Copy may be made for the residents who wish to keep a record of the case at which they have assisted for their study purpose.

3. **Physical examination record:** This is the result of a thorough examination of the patient by the physician and is a statement of his observation and finding supplemented by diagnostic aids. At the conclusion of this examination, a brief summary and the diagnosis are recorded.

4. **Laboratory reports:** Laboratory examinations are ordered by or under the direction of the attending physician. Original reports are pasted on the master sheet that becomes a part of medical record of the patient.
   - The report should be pasted in chronological order according to the date or investigation ordered.
   - All reports must be checked for accuracy of hospital number, name, date and signature of the technologist.
   - Similar procedures should be adopted in case of ECG, EEG etc.

5. **Progress Record:** Progress notes are specific statements written by the physician or his assistants. They provide a summary of the condition of the patient on admission and a chronological record of the patient's progress written every day, or even few hours during a critical condition. They are very important in the day-to-day care of

the patient and in medico-legal needs. The attending physician or his assistants must sign them.

6. **Doctors Orders:** This is a record of all orders given by the physician and it is also known as treatment record. All order should be written on this order sheet and signed by the physician. Orders are sometimes given orally or on telephone and this are transcribed by his assistant to the order sheet. The physician countersigns them on his next visit, in order to establish his responsibilities for the given orally or on telephone.
7. **Nurses' record:** The nurses, records their observation, treatment and services rendered to the patient during the absence of the physician on the nurses beside record. It serves as a means of communication between the doctor and nurse. All nurses' notes should be signed by the nurse who rendered the service; it becomes necessary at times to identify who has given certain treatment.
8. **Graphic Chart:** This record started on admission of the patient to the ward. It helps the physician to have a quick picture of the temperature, pulse and the respiration of the patient.

Besides these basic forms there are some special forms are also available which varies from patient to patient depending upon the illness. The important ones are:

- Anesthesia Record
- Operation record
- Histopathology record
- Blood transfusion record
- Intake and Output chart

Format types

Hospital standards are revised periodically to reflect changes in the delivery of healthcare service and which advances in medical care. The hospital shall maintain medical records that are documented accurately and in a timely manner, that are readily accessible, and that permit prompt retrieval of information, including statistical data. Medical record information can be structured in three ways.

- Problem Oriented Medical Records (POMR)

- Source Oriented Medical Records (SOMR)
- Integrated Medical Records (IMR)

Problem Oriented Medical Records (POMR)

Lawrence L Weed introduces the Problem Oriented Medical Records in 1960s. It provides a systematic method of documentation to reflect logical thinking on the physicians directing the care of patients. PMRO has four basic components.

a) Data base
b) Problem List
c) Initial Plans
d) Progress Notes

The element of the data base include the chief complaint, present illness, patient profile and related social data, past history and reviews, physical examination and baseline laboratory data.

The problem list has problems that require management or diagnostic work up, including medical, social economic and demographic problems. The problem should be titled and numbered as a table of contents. Thus, it contains the statement of a symptom, an abnormal finding, a physiological finding or a specific diagnosis conditions suspected or ruled out are not included.

Initial plans describe what will be done to learn more about the patient's condition, treat and conditions and educate patient about the conditions.

Progress notes are the follow up for each problem. The number and title of the appropriate problem precede each note and it consists of the following elements: Subjective (Symptomatic), Objective (measurable, Observable), assessment and plan statements. This process is SOAP and the writing of progress note in the POMR format is often referred to as "Soaping".

Source Oriented Medical Records (SOMR)

This conventional method of arrangement is in use in the majority of hospital. The record divided in sections such as physicians 'notes, laboratory reports, nursing notes, and so forth. Within each section,

entries are arranged in chronological order. Each section must be reviewed to obtain a complete impression of the patient's care and treatment.

Integrated Medical Records (IMR)

This method of arrangement is used in a limited number of health Care institutions. Integrated medical records are arranged in strict chronological order, regardless of the source of the original information. Thus, a physician's order may be followed by a consultation report or by nursing note. This type of format provides a good account of sequence of events but renders difficulty in the comparison and contrasting of patient care information.

Characteristics of medical records

Characteristics of adequate medical record documentation are the following:

- To be complete the medical record must contain sufficient data written in sequence of events to justify the diagnosis, and warrant the treatment and end results.
- Accurate: the contribution of all the staff concerned (Doctors, nurses, paramedical staff) should be thoroughly checked and the opinion given by them be spotted by findings.
- Adequate: The physician and his assistants should mark the progress note as often necessary until the patient discharged. We can judge the medical record standard through the qualitative analysis performed by the medical record department.
- Appropriate documentation: the quality of medical records depends on information entered by those professionals authorized to provide care and responsible for documenting that care. It is further required that the record contain the originals of all report.
- Proper Authentication: Those professionals who providing care to a patient, it must be documented. They also verify this care given by is signing the entry. The attending physicians must countersign at least the history, physical examination and discharge summary written by the house staff. Any entry, which required countersignature of the attending physician, must be defined the medical staff rules and regulations.

- Abbreviations: Abbreviations and symbols are to be used only when they has been approved by the medical staff and when there is an explanatory legend available to those authorized to make entries in the record. Each abbreviation and symbol should have only one meaning. The final diagnoses recorded without abbreviations.
- Timeliness: The entries regarding patient care can be making as close as records (the history, physical examination and laboratory and x-ray data etc) which should compiled within 24-48 hours after admission. Upon discharge of the patient, the record must be complete within 15 days.
- Legibility: The usefulness of the record depends on the part of legibility, when it is economically feasible and appropriate medical entries must be type.
- Correction of errors or omissions: Errors corrected by drawing a single line through the mistake, writing the explanatory statement such as "wrong information" near it and recording correct information. If an entry omitted, the entry made after the last entry of that day with an explanation regarding the omission. If an entry made in another day, it added between the lines on the proper day with the date of entry and sign.

Medical record documentation analysis

The medical record is the permanent, legal document, which must contain sufficient information to identify the patient, justify the diagnosis and treatment and record the results. As such, it must be accurate and complete. However, because a variety of health care providers- physicians, nurses, therapists and others perform documentation in the medical record and because it is performed as a secondary activity following the rendering of patient care, documentation may not always be as accurate or complete as necessary and desirable.

Types of medical record documentation analysis:

In quantitative analysis, medical record practitioners use a list of recording requirements to identify deficiencies in medical record documentation. Medical record practitioners may also identify inconsistencies that are incomplete or inaccurate. This is quantitative analysis. This applies knowledge of disease process and the policies and standards established by the health care administrators.

Quantitative analysis:

Quantitative analysis is the review of medical records to ensure that they are complete and accurate and meet documentation standards established by medical record assistance and identifying specific deficiencies in recording. Because the analysis is specially prescribed, specially trained clerical level employees may perform it. The purpose of the quantitative analysis is primarily to identify obvious and routine omissions that can be easily corrected in the normal course of hospital procedures. This procedure makes the medical record more complete for future, patient care reference, for protecting legal interest of the patient, physician and hospital and for meeting, licensing, accrediting and certifying requirements.

Qualitative analysis:

Qualitative analysis is review of the content of medical record entries for inconsistencies and omissions, which may signify that the medical record is inaccurate or incomplete. Such an analysis requires a medical terminology,

anatomy and physiology, fundamentals of disease process, medical record content, and standard of licensing, accrediting and certifying agencies. Purpose of qualitative includes making the medical record complete for reference in patient legal interests, and meeting regulatory requirements. It also contributes background or supporting information for quality assurance and risk management activities. Quality assurance also assists in diagnosis and procedure coding specificity and sequencing, which are important for ongoing medical research, administrative studies and reimbursement.

Forms- design and control

Medical record practitioners are responsible for assisting in the design and implementation of effective forms for data collection and use. Well-designed medical record forms are important communication tools and ready references inpatient care and in review of care provided. Good forms can accomplish several purposes. They can

- Reduce writing time and avoid duplication of information
- Standardize the information that is provided. Well-designed forms are also easier to complete.

The medical record practitioner assists the forms committee and hospital department by making an available the various requirements and status that may control the form in a particular state.

- Being Knowledgeable about rules governing forms design such as quality of paper, spacing printing styles, logical sequence of medical and
- Collecting sample medical record forms to assist in developing the hospital forms.

Forms analysis

A logical approach to form analysis is to review all the forms used in a certain procedure. Reviews should understand the procedure so that their analysis can be complete. One should need to know the answers to the what, when, who, how, and why questions for each step of procedures involving the form.

For background information related to procedures, the following sources should be checked:

- Manuals, regulations that are describe functional responsibilities and procedures that relate to the forms.
- Forms history file and forms subject file.
- Completed forms, which will show the types of errors, made in completing.
- Organizational charts which will show the relationships of the department responsible for the forms to other department.

Principles of forms design

Five major components usually exist on all forms. They are as follows:

- Heading: Include the title and form number
- Introduction: Explain the purpose of the form. Sometimes the purpose identified in the title.
- Instruction: Include items on have to fill in the form and what to do with the form
- Body: Consist of the grouped or sequenced items for specified information desired
- Close: Space for approving signatures

The following principles are basic to good form design:

- A uniform size of paper should be used. Standard size is 81/2 inch by 11 inch.
- A uniform binding edge should be maintained
- A uniform margin should be maintained. Chart holders on the nursing unit should accommodate the uniform margins.
- Depending on the whether the forms are to be typewritten, handwritten, line spacing, as forms should be designed.
- The quality and weight of the paper should be selected according to the record, the amount of use it will receive and whether both sides are to used.
- Coloured forms should be selected carefully because problems can occur in photocopying or microfilming coloured sheets.

The following principles are basic forms development:

- The study the purpose and use of the form and design it with the user in mind.
- Design the form as simple as possible omit unnecessary information and lines.
- Items should be listed in logical sequence
- The horizontal space allowed for typewritten entries should accommodate the type size.
- All forms should have the identification of the patient in a standard location.

- When uniform placement is possible, there should be a uniform sequence of common items on related forms.
- Use standard terminology for wording instructions.
- Form that requires recopying from other parts of the record should be avoided.
- The name of the hospital should be printed on all forms.
- Forms should be designed to provide instructions on completion, which are placed on top whenever possible.
- Answer boxes can save time in completing the data for a form and can reduce errors as well as provide uniformity of statistical items.

Filing methods, storage and retention

Numbering

Medical records in most health care facilities are filed numerically according to patients' medical record numbers. Regardless of which of this system is a utilized medical record requiring new numbers should have them assigned chronologically, and this number should be common to all departments of the hospital. The important systems are:

- **Serial Numbering:** In this method, the patient revives a new number on each time he admitted or treated by the hospital. The use of serial number for filing of records results in the filing of record personnel should have to spend much time in gathering a patient's medical record. All the number assigned to a patient must be recorded on the card in the index card.
- **Unit Numbering:** In this method, the patient receives a number during his first admission or visit to a hospital. He retains that number on all subsequent admission or treatments. This method automatically attains a unit record. All admissions records are file together in one folder and under one number.
- **Serial Unit Numbering:** In this system, filing all the records of previous admission of the patient are brought forward and filed under the latest admission number. The empty chart folder marked with a referral to the new number is a satisfactory out-guides to indicate the number under which the old record is filed.

Filing

There are three types of numeric filing system commonly used for filing of medical records.

- Straight numeric filing
- Terminal digit filing
- Middle digit filing

- **Straight Numeric Filing:** The straight numeric filing system of medical records is the strict chronological order of filing according to the hospital number in an ascending order. This is very simple method to adopt and easy to operate, easy to train a new staff and the retrieval of records are

also easy. The disadvantage of this system is all the records need to arrange serially before filing. Otherwise, the chances of misfiling are more. The highest numbers, which are the most recent, represent the greatest amount of retrieval and filing activity. Therefore, more activity and personnel will be concentrated in one part of the file area.

- **Terminal digit filing:** Terminal digit filing is a method that provides equal distribution of medical records in filing units throughout the file area. By providing an equal occupancy rate for shelving the records, terminal digit also permit more even workflow pattern. It is simple speedy and accurate method of filing based on the mathematical principle. In this system six digit number is used and divided into three parts, each part contain two digits. The last two numbers on the right hand side is known as primary digit the middle numbers are middle digit or secondary digit and the first two numbers are on the left side are tertiary digit.

In a terminal digit file, there are 100 primary sections ranging 0 to 99. When filing records, the filing clerk considers the primary digits first, taking the record to the corresponding primary section. Within each primary section, groups of records are matched according to secondary digits. After locating the correct secondary digit section, the clerk files in numerical order by the tertiary digits. In the file, the second tertiary digit changes with every record. The following sequence will occur in a terminal digit filing.

00-01-25	00-02-25	00-03-25
01-01-25	01-02-25	01-03-25
02-01-25	02-02-25	02-03-25
03-01-25	03-02-25	03-03-25
04-01-25 and so on	04-02-25 and so on	04-03-25 and so on

- A file area will require a guide for every secondary in each primary section (10,000 guides). Thus, there will be a guide for every secondary number, 00,01,02,25 etc in each terminal digit section. For particular section for primary number 25, the guide would read 00/25, 01/25, 02/25 etc.
- The advantage of this method is the records are evenly distributed among 100 primary sections. Only every 100th primary section of the file and the distribution is perfect and extensive.
- The work allocation to each clerk is proper and the supervision is easy and effective. Misfiling substantially can be reduced. The

disadvantages are training a new staff may takes long period of time that straight numerical system.

- **Middle Digit Filing:** In this system, the filing clerk files according to pairs of digits as in terminal digit filing system. However, the primary, secondary and tertiary digits are in different positions. The middle pairs of digits in six digit number are the primary digits, the digits on the left are the secondary digits, and the digits on the right are tertiary digits.

  The sequence of a middle digit file will be as following

➢ 01-25-96	➢ 99-25-96
➢ 01-25-97	➢ 99-25-97
➢ 01-25-98	➢ 99-25-98
➢ 01-25-99	➢ 99-25-99
➢ 02-25-00	➢ 00-26-00 etc

  - From the first example, it is seen that blocks of 100 records are in straight numerical order. This has several advantages. It is simple to pull up to 100 consecutively numerical systems to a study purpose. Conversion form a straight numerical system to a middle digit system is much simpler than conversion to a terminal digit system. Middle digit filing provides a more distribution of records than straight numerical filing the misfiling is reduced as in the terminal digit filing.

Storage

The medical record department must include sufficient space equipments to store patients' records so they are easily accessible when requested. Adequate filing when requested. Adequate filing equipment, lighting, temperature control, supplies, and attention to safety in the file room all contribute to the productivity of filing clerks. Open-shelf file units and five drawer filing cabinets are the most commonly used storage units for medical records. Open shelf units are recommended over cabinets for the following reasons:

- They are less expensive than filing cabinets

- Personal can file or pull records faster because there is no opening or closing of drawers
- Most importantly, open shelves accommodating more records in a given floor areas, as well as requiring less airless space.

Guides should be placed throughout the files to expedite the filing and finding of records. The number of guides needed depends upon the thickness of the majority of the medical record in the file. There are two basic methods of filing records-centralized and decentralized.

Centralization means that all materials and information about a patient are funneled into a single file held in a central location. A centralized file usually means that the patient, ambulatory care and emergency records are filed in a single central location.

Decentralized files result when certain parts are filed in another location away from central file area. In hospitals this usually means the emergency record of a patient is filed where emergency records are stored, or ambulatory care records are filed in the ambulatory care area. Centralization has many advantages, some of which are listed here.

- There is less duplication of effort with record regard to creation, maintenance and storage of records.
- There is less overall expenditure on space and equipment.
- A composite record containing all available information is of greater help to the health care team than one in which parts are scattered in several places.
- Procedures and policies for record activity are standardized.
- Personnel may become more proficient in various file room functions and procedures.
- Record control and security are easier to maintain.
- Supervision of file room personnel is more consistent.

Retention polices

The length of medical record can retained in active and inactive storage will greatly depend on type of the health care facility and the activity of the medical staff. In developing a record retention policy, a health care institution must be guided by its own patient care and research activities, taking into consideration the possibility of future legal actions by patients.

Since a hospital or other health care institution is seldom requested to produce medical records older than ten (10) years for clinical, scientific, legal or audit purposes, it is ordinarily sufficient to retain the medical records of cases ten years after the most recent patient care usage in the absence of legal considerations. After the retention period inactive records may be destroyed provided that the institution.

- Retains the basic information such as dates of admission and discharge, names of responsible physicians, record of diagnoses and operations, operative reports, pathology reports and discharge resumes for all records so destroyed
- Retains complete medical records of minors for the period of minority plus the applicable statute of limitations as prescribed
- Retains complete medical records of patients under mental disability in like manner as those of patients under disability of minority
- Retains complete patient medical record for longer periods of time when requested in writing by one of the following:
    - An attending or consultant physician of the patient
    - The patient or someone acting legally in his behalf
    - Legal counsel for party having an interest affected by the patient medical record

Indices and registers

Hospitals maintain various indices and registers so that patient medical records and other information can be located and classified for patient care purpose, case studies, utilization management and other administrative purpose, and for compliance with state regulation or licensure requirements.

Mainly there are four types of indices that are maintained in medical records department.

Patient index

The patient alpha index is an alphabetical arrangement of cards according to names of the patients admitted to the hospital either as outpatient or inpatient. This is very important index and considered as the key for locating the medical record of all patients. This is a card with 5 inch x 3inch in size in which the sociological data of the patient is typed. These cards are filed in strict alphabetical order because these cards are the only source to find out the patient's record if the patient looses the identity card. Patient alpha index should contain sufficient information such as hospital number, name, date of birth, sex, address, date of registration or admission, name of attending physician, diagnosis, units etc.

Diagnostic index

Diagnostic index, not only the key to locate the records of patients with various diseases for study and research purposes but also is useful in compiling certain statistics about medical care given the hospital. Although this index can be used to answer to simple statistical question, its primary functions are to produce records according to diagnosis and treatments, rather than detailed statistical information. Detailed statistics should be obtained through the medical records themselves, and the index should be used to locate them. The size of the diagnostic index is usually 8 inches X 5 inches and separate card is prepared for each disease.

Operation index

This is an account of all operations performed in the hospital. For various types of operations in a given period can easily be accounted with a short time. It is also in collection and compilation of operation statistics for research or study. The size of the index card is 8 inch X 5 inches. Basic data for any type of disease and operation index include the disease, injury, and procedures classification code, the patient's medical record number, sex and age of the patient, identification of physician by code number or name, dates of admission and discharge or year with length of stay in days.

Surgeon index

A surgeon index is kept to provide a means of locating the records of patient's operated by the individual surgeon or as a list of patients operated by him. This index arranged alphabetically by names of surgeon and others who assisted the operation. The size index is 8 inch X 5 inches.

Registers

The need to maintain certain types of registers or logs may be determined by the requirements for record control measures or by state regulations imposed on the hospital.

Admission and discharges register

The patient register or admission register is a chronological list of patient names by date of admission as inpatients. Minimum data items required are date of admission, time of admission if needed, patient name and medical record number. Additional items may include room assignment, sex and attending physician's name. If the admitting or medical record department prepared a daily list of admissions and hospital births, a copy may be filed to serve as an admission register. In some states, the hospital licensing laws may include requirements for a patient registration log (admission register).

Operating room register

The operating room register is a chronological list all operative procedures performed in the hospital's surgical suite. It is usually maintained in the operating room suite area and contains the date and time of the procedures, the name of the patient, the type of procedure performed, the type of anesthesia used, and the name surgeon and the anesthesiologist. The operating room register may be required by state regulations; however it serves the hospital as a valuable reference for certain types of statistical data on utilization of services and human resources.

Birth register

The birth register may be kept in the delivery room area or in the medical record department. It may be simple or detailed, depending on the needs of the obstetrical service and the hospital. The minimum data would be date and time of birth, sex of newborn, whether baby was born live or still born, name of the mother, name of the physician or staff member in attendance at the time of delivery, and date when birth certificate was mailed to the register of vital records. A birth register may be required for state vital record law.

Death register

A death register may be maintained in the medical record department, pathology department, or admitting office. It is chronological list of all patients who dies in the hospital or who were dead on arrival at the hospital. It contains the date of death, name of deceased person, name of physician who completed the medical portion of the death certificate and the name of the mortician, coroner or medical examiner who removed the body from the hospital.

Emergency services register

A register is maintained in the emergency department to record patient's encounters by date. The minimum date items to be entered in the emergency service register are the date and time of arrival, name of the patient, and means of transportation to the emergency service, treatment or advice given, disposition and time of departure.

Cancer registry

The cancer registry requires maintaining an index of patient names and address for follow up studies on the outcome of malignancy, a statistical index on the type and site of malignancy with cross referencing to the patient's medical record and a patient's record of history and treatment, when applicable. A hospital that has no formal cancer program need not maintain a cancer registry. In some states the cancer registry program is carried out at the state level and hospitals cooperate by submitting abstract data from patient medical record

Nomenclature, classification and coding

International classification of diseases

The international statistical classification of diseases and related health problems, usually called by the short form name international classification of diseases (ICD), is the international standard diagnostic tool for epidemiology, health management and clinical processes. The ICD is maintained by the world health organization (WHO), the directing and coordinating authority for health system providing a system of diagnostic codes for classifying diseases, including nuanced classification of a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances, and external cause of injury or disease. This system is designed to map health conditions to corresponding generic categories together with specific variations, assigning for these a designated code, up to six characters long. Thus, major categories are designed to include a set of similar disease.

The ICD published by the WHO and used worldwide for morbidity and mortality statistics, reimbursement systems, and automated decision support in health care. This system is designed to promote international comparability in the collection, processing, classification and presentation of these statistics. It is a core statistically based classificatory diagnostic system for health care related issues of the WHO family international classifications.

ICD is revised periodically and is currently in its 10th revision, which was developed in 1992 to track health statistics. ICD-11 was planned for 2017.

History

In 1860, during the international statistical congress held in London, Florence nightingale made a proposal that was result in to the first model of systemic collection of hospital data. In 1893, a French physician, Jacques Bertillon, introduced the Bertillon classification of causes of death at a congress of international statistical institute in Chicago. It is based on the principle of distinguishing between general diseases and those localized to a particular organ or anatomical site, are used by the city of Paris for classifying deaths. In 1898, the American public health association (APHA) recommended revising the system every ten years to ensure the system remained current with medical practice

advances. As a result, the first international classification of causes of death took place in 1900, with revisions occurring every 10 years thereafter. At that time, classification system was contained an alphabetic index and tabular list.

The revisions that followed contained minor changes, until the sixth revision of the classification system. With the sixth revision, the classification system expanded to two volumes. The sixth revision included morbidity and mortality conditions, and its title was modified to reflect the changes: International Statistical Classification of Diseases, Injuries and Causes of Death (ICD). Prior to the sixth revision, responsibility for ICD revisions fell to the Mixed Commission, a group composed of representatives from the International Statistical Institute and the Health Organization of the League of Nations. In 1948, the WHO assumed responsibility for preparing and publishing the revisions to the ICD every ten years. WHO sponsored the seventh and eighth revisions in 1957 and 1968 respectively. It later becomes clear that the established ten-year interval between revisions was too short.

Versions of ICD

ICD-6

The ICD-6, published in 1949, was the first to be shaped to become suitable for morbidity reporting. Accordingly, the name changed from International List of Causes of Death to International Statistical Classification of Diseases. The combined code section for injuries and their associated accidents was split into two, a chapter for injuries, and a chapter for their external causes. With use for morbidity, there was a need for coding mental conditions and for the first time a section on mental disorders added.

ICD-7

The International Conference for the Seventh Revision of the International Classification of Diseases was held in Paris under the auspices of WHO in February 1955. In accordance with a recommendation of the WHO Expert

Committee on Health Statistics, this revision was limited to essential changes and amendments of errors and inconsistencies.

ICD-8a

The Eighth Revision Conference convened by WHO met in Geneva, from 6-12 July 1965. This revision was more radical than the Seventh but left unchanged the basic structure of the Classification and the general philosophy of classifying diseases, whenever possible, according to their etiology rather than a particular manifestation. During the years that the Seventh and Eighth Revisions of the ICD were in force, the use of the ICD for indexing hospital medical records increased rapidly and some countries prepared national adaptations, which provided the additional detail needed for this application of the ICD. In the USA, a group of consultants was asked to study the eighth revision of ICD (ICD-8a) for its applicability to various users in the United States. This group recommended that further detail be provided for coding hospital and morbidity data. The American Hospital Association's "Advisory Committee to the Central Office on ICDA" developed the needed adaptation proposals, resulting in the publication of the International Classification of Diseases, Adapted (ICDA). In 1968, the United States Public Health Service published the International Classification of Diseases, Adapted, 8th Revision for use in the United States (ICDA-8a). Beginning in 1968, ICDA-8a served as the basis for coding diagnostic data for both official morbidity [and mortality] statistics in the United States.

ICD-9

The International Conference for the Ninth Revision of the International Classification of Diseases, convened by WHO, met in Geneva from 30 September to 6 October 1975. In the discussions leading up to the conference, it had originally been intended that there should be little change other than updating of the classification. This was mainly because of the expense of adapting data processing systems each time the classification was revised.

There had been an enormous growth of interest in the ICD and ways had to be found of responding to this, partly by modifying the classification itself and partly by introducing special coding provisions. A number of representations were made by specialist bodies which had become interested in using the ICD for their own statistics. Some subject areas in the classification were regarded as

inappropriately arranged and there was considerable pressure for more detail and for adaptation of the classification to make it more relevant for the evaluation of medical care, by classifying conditions to the chapters concerned with the part of the body affected rather than to those dealing with the underlying generalized disease.

At the other end of the scale, there were representations from countries and areas where a detailed and sophisticated classification was irrelevant, but which needed a classification based on the ICD in order to assess their progress in health care and in the control of disease. A field-test with a bi-axial classification approach-one axis (criterion) for anatomy, with another for etiology-showed the impracticability of such approach for routine use.

The final proposals presented to and accepted by the Conference in 1978 retained the basic structure of the ICD, although with additional detail at the level of the four digit subcategories, and some optional five-digit subdivisions. For the benefit of users not requiring such detail, care was taken to ensure that the categories at the three-digit level were appropriate.

For the benefit of users wishing to produce statistics and indexes oriented towards medical care, the Ninth Revision included an optional alternative method of classifying diagnostic statements, including information about both an underlying general disease and a manifestation in a particular organ or site. This system became known as the dagger and asterisk system and is retained in the Tenth Revision. A number of other technical innovations were included in the Ninth Revision, aimed at increasing its flexibility for use in a variety of situations. It was eventually replaced by ICD-10, the version currently in use by the WHO and most countries. Given the widespread expansion in the tenth revision, it is not possible to convert ICD-9 data sets directly into ICD-10 data sets, although some tools are available to help guide users. Publication of ICD-9 without IP restrictions in a world with evolving electronic data systems led to a range of products based on ICD-9, such as MeDRA or the Read directory.

ICD-9 is primarily a universal classification system for grouping illnesses. Its secondary purpose is for use in hospitals disease indexing. The ninth revision of the ICD contains an innovation in that there are two codes, diagnostic descriptions in which contain elements of information both about a localized manifestation or complication and about a more generalized underlying disease process. One of the codes marked with a dagger (+) positioned in the part of the classification in which the diagnostic description is located according to normal

ICD principles. That relating to the underlying disease, and the other marked with an asterisk (*) is positioned in the chapter of classification relating to the organ system to which the manifestation or complication relates. Thus, tuberculous meningitis has its dagger code in the chapter for infectious and parasitic disease, and its asterisk code in nervous system chapter.

The necessity for this arose from the desire of specialists and those concerned with statistics of a medical care to have certain manifestations, which medical care problems in their own right classified chapters relating to the relevant organ system.

The dagger and asterisk categories are in fact alternative positioning in the classification for the relevant conditions, enabling retrieval or statistical analysis from their viewpoint. It is, however a principle of ICD classification that the dagger category is the primary code and that the asterisk code is secondary. So it is important where it is desired to work with the asterisk code, and both are used, to use some special mark or a predetermined positioning in the coded record, to identify which is the dagger, and which the asterisk, doe for the same entity.

ICD-9 consists of two volumes-tabular list and alphabetical list of disease. Volume first consists of 17 chapters and 2 supplementary classification schemes.

1. Infections and parasitic diseases (001-139)
2. Neoplasm (140-239)
3. Endocrine, nutritional and metabolic diseases and immunity disorders (240-279)
4. Diseases of blood and blood forming organs (280-289)
5. Mental disorders (290-319)
6. Diseases of nervous system and sense organs (320-389)
7. Diseases of circulatory system (390-459)
8. Diseases of respiratory system (460-519)
9. Diseases of digestive system (520-579)
10. Diseases of genito-urinary system (580-629)
11. Complications of pregnancy, child birth and puerperium (630-676)
12. Diseases of skin subcutaneous tissue (680-709)

13. Diseases of musculo-skeletal system and connective tissue (710-739)
14. Congenital anomalies (740-759)
15. Certain conditional originating in perinatal period (760-779)
16. Symptoms signs and ill defined conditions (780-799)
17. Injury and poisoning (800-999)

Supplementary scheme are as follows:

1. Supplementary classification of external causes of injury and poisoning (E800-E999)
2. Supplementary classification of factors influencing health statues and contact with health services (V01-V82).

The volume II consists of alphabetical index. The alphabetical index is essential to the tabular for clear coding. Alphabetical index consists of three sections.

Section first is the index of diseases, syndromes, pathological conditions, injuries, signs symptoms, problems and other reasons for contact with health services (including 001-999 and V01-V82). Section II is the index of external causes of injury that is (fire, explosion, fall, assault, collision, submersion etc-E800-E999). Section III is the index of drug and other chemical substances giving rise of poisoning and other adverse effects.

Structure of code numbers

The basic number of digits applied to a disease condition is three, such as 410- acute myocardial infarction. In many instances, the code number expanded by use of a decimal digit .0 to .9, to amplify or permit more details in the classification of disease. Some codes further subdivided into fifth digit classification, resulting in a code number with a maximum of five digits.

Operative procedures assigned two digits, such as 32 excisions of lung and bronchus. Here also decimal digits .0 to .9, which assigned to describe the precise procedures, such as 32.5- complete pneumonectomy. An additional decimal digit assigned for designated procedures, creating a maximum four-digit procedure number.

Other features

In addition to the code numbers for disease and operative procedures, the ICD-9 contains other options designed to display valuable statistical data for those desiring this information. A supplementary classification factors influencing health status and contact with health service provided to record patient visits for reasons not related to a particular disease or injury. Admission in a hospital for voluntary sterilization only is not a disease or injury and therefore, coded by using the supplementary classification. These codes commonly referred to as V-codes, since the letter 'V' always precedes number itself.

The E code classification of external causes or injury and poisoning (E800-E998), used in conjunction with a disease or injury code number, as they only provide supplemental information to explain the precipitating incident.

ICPM

When the World Health Organization (WHO) published ICD-9, the International Classification of Procedures in Medicine (ICPM) was also developed (1975) and published (1978). The ICPM surgical procedures fascicle was originally created by the United States, based on its adaptations of ICD (called ICDA), which had contained a procedure classification since 1962. ICPM published separately from the ICD disease classification as a series of supplementary documents called fascicles (bundles or groups of items). Each fascicle contains a classification of modes of laboratory, radiology, surgery, therapy, and other diagnostic procedures. Many countries have adapted and translated the ICPM in parts or as a whole and are using it with amendments since then.

ICD-9-CM

International Classification of Diseases, Clinical Modification (ICD-9-CM) is an adaption created by the U.S. National Center for Health Statistics (NCHS) and used in assigning diagnostic and procedure codes associated with inpatient, outpatient, and physician office utilization in the United States. The ICD-9-CM is

based on the ICD-9 but provides for additional morbidity detail. It is updated annually on October 1.

It consists of two or three volumes:

- Volumes 1 and 2 contain diagnosis codes. (Volume 1 is a tabular listing, and volume 2 is an index.) Extended for ICD-9-CM
- Volume 3 contains procedure codes. ICD-9-CM only

The NCHS and the Centers for Medicare and Medicaid Services are the U.S. governmental agencies responsible for overseeing all changes and modifications to the ICD-9-CM.

ICD-10

Work on ICD-10 began in 1983, and the new revision was endorsed the 43rd World Health Assembly in May 1990. The latest version came into use in WHO Member States starting in 1994.The classification system allows more than 155,000 different codes and permits tracking of many new diagnoses and procedures, a significant expansion on the 17,000 codes available in ICD-9. Adoption was relatively swift in most of the world. Several materials are made available online by WHO to facilitate its use, including a manual, training guidelines, a browser, and files for download. Some countries have adapted the international standard, such as the "ICD-10-AM" published in Australia in 1998 (also used in New Zealand), and the "ICD-10-CA" introduced in Canada in 2000.

The ICD-10 comprises three volumes: Volume 1 contains the main classification, Volume 2 provides guidelines to users of the ICD, and Volume 3 is the alphabetical index to the classification.

Most of the volume I is taken up with the main classification, composed of the list of 3characters and the tabular list of inclusions and 4 character subcategories. The “core classification” is the mandatory level for reporting. This core classification also list chapter and block titles. The tabular list giving the full detail of 4-character level divided into 21 chapters. Volume 1 also contains morphology of the neoplasm, special tabulation list, definitions and nomenclature regulations.

Chapters

The classification divided into 21 chapters. The first character of a code is a letter. Each letter is associated with a particular chapter, except for the letter D used in both chapter II (neoplasm) and chapter III (disease of the blood and blood forming organs) and the letter h, which is used in both chapter VI (Disease of the eye and adnexa) and chapter VIII (disease of the ear and mastoid process). Four chapters (i, ii, xix, xx) use more than one letter. Each chapter contains sufficient 3 character categories, not all available codes are used, allowing space for future revision and expansion.

Chapter I to XVII relate to disease and other morbid conditions and chapter XIX to injuries, poisoning and certain other consequences of external causes, Chapters XVIII covers symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified. Chapter XX, external causes of injury and poisoning. Finally chapter XXI, factors influencing health status and contact with health services.

The chapters subdivided into homogenous "block" of three character categories. Within each block, some of the three characters are of single conditions, selected because of their frequency, severity or susceptibility to public health intervention, while others are for groups of disease with some common characteristics.

Although not mandatory for reporting at the international level, most of the three character categories subdivided by means of a fourth, numeric character after a decimal point, allowing up to ten subcategories. Where a 3 characters category which not divided, it is recommended that the letter "X" to be used to fill the fourth position so that the codes are of a standard length for data processing. The fourth character .8 generally used for other conditions belonging to the three-character category, and .9 mostly used to convey the same meaning as the three-character category title, without adding any additional information.

The fifth and subsequent character levels are usually sub classifications along a different axis from the fourth character. They found in chapter XIII, chapter XIX and chapter XX.

Code U00 - U49 are to be used the provisional assignment of new disease of uncertain etiology. Codes U59-U99 may be use in research.

1. Certain infectious and parasitic disease (A00-B99)
2. Neoplasm (C00 D48)

3. Diseases of the blood and blood forming organs and certain disorders involving immune mechanism (D50-D89)
4. Endocrine, nutritional and metabolic disease (E00-E99)
5. Mental and behavioral disorder (F00-F99)
6. Diseases of the nervous system (G00 – G99)
7. Diseases of eye and adnexa (H00 – H59)
8. Diseases of ear and mastoid process (H60-H95)
9. Diseases of the circulatory system (I00 – I99)
10. Diseases of the respiratory system (J00 – J99)
11. Diseases of the digestive system (K00 – K93)
12. Disease of skin and subcutaneous tissue (L00 – L99)
13. Diseases of the musculo-skeletal system and connective tissue (M00 – M99)
14. Diseases of the genitor - urinary system (NOO – N99)
15. Pregnancy, childbirth and puerperium (O00 – O99)
16. Certain conditions originating in the perinatal period (P00 – P96)
17. Congenital malformation, deformation, chromosomal abnormalities (Q00 – Q99)
18. Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00 – R99)
19. Injury, poisoning and certain other consequences and external causes (S00 – T98)
20. External causes of morbidity and mortality (V 01- Y 98)
21. Factors influencing health status and contact with health services (Z00- Z99)

ICD-10-CM

Adoption of ICD-10-CM has been slow in the United States. Since 1979, the USA had required ICD-9-CM codes for Medicare and Medicaid claims, and most of the rest of the American medical industry followed suit. On 1 January 1999, the ICD-10 (without clinical extensions) was adopted for reporting mortality, but ICD-9-CM was still used for morbidity. Meanwhile, NCHS received permission from the WHO to create a clinical modification of the ICD-10, and has production of all these systems:

- ICD-10-CM, for diagnosis codes, is intended to replace volumes 1 and 2. Annual updates are provided.
- ICD-10-PCS, for procedure codes, is intended to replace volume 3. Annual updates are provided.

On August 21, 2008, the US Department of Health and Human Services (HHS) proposed new code sets to be used for reporting diagnoses and procedures on health care transactions. Under the proposal, the ICD-9-CM code sets would be replaced with the ICD-10-CM code sets, effective October 1, 2013. On April 17, 2012, the Department of Health and Human Services (HHS) published a proposed rule that would delay, from October 1, 2013 to October 1, 2014, the compliance date for the ICD-10-CM and PCS. Once again, Congress delayed implementation date to October 1, 2015, after it was inserted into "Doc Fix" Bill without debate over objections of many.

Revisions to ICD-10-CM Include:

- Relevant information for ambulatory and managed care encounter
- Expanded injury codes
- New combination codes for diagnosis/symptoms to reduce the number of codes needed to describe a problem fully
- Addition of sixth and seventh digit classification
- Classification specific to laterality
- Classification refinement for increased data granularity

ICD-10-CA

ICD-10-CA is a clinical modification of ICD-10 developed by the Canadian Institute for Health Information for morbidity classification in Canada. ICD-10-CA

applies beyond acute hospital care, and includes conditions and situations that are not diseases but represent risk factors to health, such as occupational and environmental factors, lifestyle and psychosocial circumstances.

ICD-11

The World Health Organization is currently revising the International Classification of Diseases (ICD) towards the ICD-11. The development is taking place on an internet-based workspace, called iCAT (Collaborative Authoring Tool) Platform, somewhat similar to a wiki – yet it requires more structure and peer review process. The WHO collaborates through this platform with all interested parties.

The final draft of the ICD-11 system is expected to be submitted to WHO's World Health Assembly (WHA) for official endorsement by 2017. The draft review was completed in April 2015 a final version for approval at the WHA is expected in 2018.

In ICD-11, each disease entity will have definitions that give key descriptions and guidance on what the meaning of the entity/category is in human readable terms - to guide users. This is advancement over ICD-10, which had only title headings. The Definitions have a standard structure according to a template with standard definition templates and further features exemplified in a "Content Model". The Content Model is a structured framework that captures the knowledge that underpins the definition of an ICD entity. The Content Model therefore allows computerization (with links to ontologies and SNOMED CT). Each ICD entity can be seen from different dimensions or "parameters". For example, there are currently 13 defined main parameters in the Content Model (see below) to describe a category in ICD.

- ICD Entity Title - Fully Specified Name
- Classification Properties - disease, disorder, injury, etc
- Textual Definitions - short standard description
- Terms - synonyms, other inclusion and exclusions
- Body System/Structure Description - anatomy and physiology
- Temporal Properties - acute, chronic or other
- Severity of Subtypes Properties - mild, moderate, severe, or other scales
- Manifestation Properties - signs, symptoms
- Causal Properties - etiology: infectious, external cause, etc

- Functioning Properties - impact on daily life: activities and participation
- Specific Condition Properties - relates to pregnancy etc.
- Treatment Properties - specific treatment considerations: e.g. resistance
- Diagnostic Criteria - operational definitions for assessment

ICD exists in 41 Languages in electronic versions and its expression in multiple languages will be systematically pursued in ICD11.

Mental and behavioral disorders

The ICD includes a section classifying mental and behavioral disorders (Chapter V). This has developed alongside the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM) and the two manuals seek to use the same codes. There are significant differences, however, such as the ICD including personality disorders in the same way as other mental disorders, while the DSM-IV-TR lists them on a separate "axis". The WHO is revising their classifications in these sections as part the development of the ICD-11 (scheduled for 2017), and an "International Advisory Group" has been established to guide this. An international survey of psychiatrists in 66 countries comparing use of the ICD-10 and DSM-IV found that the former was more often used for clinical diagnosis while the latter was more valued for research. The ICD is actually the official system for the US, although many mental health professionals do not realize this due to the dominance of the DSM. A psychologists has stated: "Serious problems with the clinical utility of both the ICD and the DSM are widely acknowledged".

ICD- oncology

One area requiring specific detailed information on the effectiveness and outcome of treatment is the study of tumors or neoplasm known as ***oncology***. For adequate statistical information and follow-up of patients, a detailed classification established to record the numbers and types of tumor.

The ICD-O divided into three sections. The site or location in the body, which contains the tumor, is assigned a code number (four digit code numbers that run from 140.0 to 199.9). The morphology numerical list contains code numbers, which used to specify the type of tumor found and its behavior. The morphology terms have five digit code numbers that run from 8000/0 to 9990/6, the first four digits indicate the specific histological terms and the fifth digit after the

slash is a behavior code. It can be add an optional six digit to the morphology code number, which indicates differentiation of the tumor mass.

Health care statistics

Health care statistics deals with applications of statistics to health Including public health, epidemiology, forensic medicine and clinical research Etc. health statistics are crucial for decision making at all levels of health care system. It facilitates better decisions in policy design, health planning, management, monitoring and evaluation of programs and services including patient care and facilitate improvements in overall health services performance and outcome.

Medical records are the prime source of data used in compiling medical care statistics. Medical record practitioner must not only be able to define the basic data elements, but also where they originate, how they can be compile, where they are needed, and the purposes they serve.

Common hospital percentages and rates

Commonly used percentages and rates are birth rate, death rate, autopsy rate, infection rate, cesarean rate, in patient census, avg. length of stay etc.

Birth rate

Birth rate is the total number of live births per 1000 of a population in a year. It can be calculated in several ways. This is used to calculate population rate.

Death rate

Various death rates may be calculated: gross death rate, net death rate, anesthesia death rate, postoperative death rate, maternal death rate, neonatal death rate, etc. Deaths are included in discharges because, like discharges, deaths are terminations of inpatient hospitalizations. Hospital death rate defined as the proportion of inpatient hospitalizations that ends in death, usually expressed in percentage. Counts of deaths occurring both within 48 hours and those over 48 hours of admission currently needed in reports.

Patients who are dead on arrival (DOA) are not included when figuring these rates. Patients who die in the emergency room where there has been no administrative decision to provide them with room, board or continuous nursing in an area of the hospital where patients generally stay overnight not included when figuring this rate. When such administrative decision has been made and the patient dies when receiving lifesaving services in any unit of the hospital other than the emergency unit, this patient is considered a hospital patient and therefore, a hospital death.

- **Hospital death rate (Gross Death Rate):** The proportion of inpatient hospitalization that end in death, usually expressed as a percentage.

$$\text{GDR} = \frac{\text{No. of inpatient death in a period X 100}}{\text{No. of discharges in the same period}}$$

- **Net Death Rate:** The ratio of the total number of deaths for a period occurring in the hospital 48 hours or more after admission to the total number of discharges and deaths in 48 hours and over for that period.

$$\text{NDR} = \frac{\text{Total deaths- those under 48 hrs X 100}}{\text{Total discharges-death under 48 hours}}$$

- **Post Operative death rate:** The ratio compares the deaths within ten days after surgery to the total number of patients operated upon for the period.

$$= \frac{\text{Total no. of deaths within 10 days postoperative for a period x 100}}{\text{Total no. of patients operated upon for the period.}}$$

- **Maternal Death Rate:** This ratio represents maternal deaths for a period to the total number of obstetrical patients discharged. It includes only patient whose death is a result of an obstetric complication of the pregnancy, labor, or the puerperium; or from interventions, omissions or treatment. This is a direct obstetric death.

$$\text{MDR or MMR} = \frac{\text{Total No. of direct maternal death X 100}}{\text{Total No. of obstetrical discharges}}$$

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- **Neonatal Death Rate or Infant Mortality Rate:** This ratio reflects the deaths of infants born in the hospital to the number of infants discharged. Fetal deaths are included because they are not newborn inpatients. Infants both outside of the hospital and admitted should be recorded as child inpatients.

$$\text{NDR or IMR} = \frac{\text{Total No. of new born death X 100}}{\text{Total No. of new born infants discharged}}$$

- **Anaesthesia Death Rate:** This is the ratio of deaths caused by anaesthetic agents for a period to the number of anesthetics administrated for the period. An anaesthetic death defined as a death that takes place while the patient is under anaesthesia or, which caused by anaesthetics or other agents used by the anaesthetist or anaesthesiologist in the practice of his/her profession.

$$\text{ADR} = \frac{\text{Total No. of deaths caused by anesthetic agents X 100}}{\text{Total No. of administrated for the period}}$$

- **Fetal Death Rate or Still Birth Rate:** This ratio computes the number of fetal deaths to the total number of births in a given period.

$$\text{FDR} = \frac{\text{Total No. of intermediate/ late fetal death for a period X 100}}{\text{Total No. of births (intermediate and late fetal deaths)}}$$

Infection rates

Hospital bylaws should specify that there be a hospital wide committee charged with the responsibility to investigate, control, and prevent infections.

- **Postoperative infection rate:** This rate represents the ratio of all infections in clean surgical cases to the number of surgical operations.

Postoperative infection rate = No of Infections in Post op. Cases X 100
Total no. of surgical operations

Autopsy rate

Autopsy rate is the ratio of autopsies to death.

- **Hospital autopsy rate:** It is the ratio of total number of autopsy in a period to the number of deaths of hospital patients whose bodies are available for hospital autopsy.

Hospital autopsy rate= total hospital autopsies x 100

No. of deaths of hospital patients whose

bodies are available for autopsy

- **Net autopsy rate:** this is the ratio during any given time period of all inpatient autopsies to all inpatient deaths minus unautopsied coroners or medical examiners cases.

Net autopsy rate= total in patent autopsies in a given period x 100

Total inpatient deaths – unautopsied cases

Cesarean section rate

It is the ratio of cesarean sections performed to actual deliveries in the period, not the number of obstetrical discharges.

C.S rate= total no. of cesarean sections performed x 100
Total no. of deliveries in that period

Length of stay calculations

This number reflects calendar days from admission to discharge. To compute a patient's length of stay, the date of admission is subtracted from the date of discharge. If the patient was admitted and discharged the same day,

length of stay was one day because a partial day's stay is never reported as a fraction of a day.

- **Total length of stay** (for all inpatients): it is the sum of the days' stay of any group of inpatients discharged during a specific period.

- **Average length of stay**: this figure reflects the average hospitalization stay of inpatients discharged during the period under consideration. The average length stay for newborn inpatients reported separately.

  Avg. length of stay= Total length of stay (discharge days)
  Total discharges

Inpatient census

Inpatient census is the no. of inpatients present at any time, which is calculated as follows: the patients remaining in the hospital at the census taking time for a specific day, plus the admissions for the next day, minus the discharges (including deaths) for that day, equal the patients remaining at the next census taking time.

- **Inpatient service day:** This measures the services received by one patient in one 24 hour period.

- **Average daily inpatient census:** it records the average number of inpatients present each day for a given period time.

  Avg. inpatient census= total inpatient service days for a period
  Total no. of days in that period

- **Inpatient bed compliment:** it is the total number of beds available in the hospital both occupied and vacant, on a given day.

- **Bed occupancy rate:** is the proportion of inpatient beds occupied. It is the ratio of inpatient service days to inpatient bed-count days in a period under consideration. It generally expressed as a percent.

  $$BOR = \frac{\text{Total inpatient service days for a period x 100}}{\text{Total inpatient bed count days x no. of days in the period}}$$

Legal aspects of medical records

The medical record is who, what, why, where and when of patient care in the hospital. With the advancement in medical knowledge and complexity of modern medical and surgical treatment existing in hospital today, an accurate and adequate medical record is essential as documentary reference of the care and treatment, which the patient received in the hospital.

Each medical record reveals information always centered on a patient. The patient is the recipient of the medical care, which is offer to him by a team that usually consists of the doctor, the nurse and the paramedical professionals. This care is offered by the team to the patient in a particular location, this being the hospital. All activities by the team in this location are for the benefit of the patient and this is record thus making the existence of the hospital medical record possible.

This hospital compiles and keeps medical records primarily for the benefit of the patient and the protection of the hospital and physician. However, the personal data contained therein, considered as a confidential for the benefit of the patient, medical records are also keep as a guide to consultants, for the education, for the training, research and the protection of the physician, other staff, and hospital against unjust criticism.

Confidentiality of medical records

The primary purposes of medical record are to document the course of the patient's health care and to provide a medium of communication among health care professionals for current and future patient care. In order to fulfill these purposes significant amounts of data must be reveal and record. The patient must be assure that the information shared with health care professionals will remain confidential; otherwise, the patient may withhold critical information, which could affect the quality of care provided.

Medical records containing information is both sensitive and confidential. Individuals have differing perceptions of the sensitivity of the information about themselves. For some an address may be sensitive, for others it may be the nature of their illness. It generally accepted that information exchanged between patient and doctor, should be confidential and there is an ethical expectation that

doctors will respect confidentiality. If either the patient or the doctor suspects that the record may not remain confidential, the quality of the medical record and hence the quality of care may be suffer. Patients may be unwilling to divulge sensitive information that could compromise care decisions and put them at a risk. Clinicians may hold back from recording sensitive data to protect the patient care in some circumstance themselves. The medical record used either, as a personal or an impersonal document.

Personal document

The medical record is a form of document, a historical record, the contents of which is not only for diagnostic purpose but it has legal value too. As a confidential and privileged communication, the patient has a personal interest on the record and therefore it is not available to outside agencies such as insurance companies, compensation carriers or any other similar organizations except upon receipt of an authorization signed by the patient. Neither relatives or friends nor husband or wife has any right to review the record of the patient unless authorization received from the patient.

If the patient should be hospitalizes under the care of another physician, the second physician should be allowed access to the record of previous hospitalization. If the patient subsequently admitted to another hospital, a summary may, be sent upon request from the hospital or physician. In such an instance, an authorization is not usually consider necessary, as the information is being release, in the interest of better patient care. When a patient is personally requesting information, it is not always in the best interest of the patient to know all details concerning his illness. In such instance, a wise policy is to consult the attending physician before releasing any information to the patient.

In case the patient personally requests information from his own record, it is not always in the best interest of the patient that he knows all the details concerning his illness. It is a wise policy in all such instances to consult the physician. It is doubtful however whether the hospital would be justified in refusing the information to the patient even against the advice of attending physician. Anyway, the laws differ from country to country, even from hospital to hospital.

Impersonal document

As an impersonal document, the record may be used for research or study when such cautions need not be exercised as when it is used as a personal document. Because it has no connection with the patient as an individual, moreover, only physicians, medical students, nurses and other paramedical staff use it in this manner, all of whom bound by the code of professional secrecy. In such instances, the record of the individual loses its identity as a personal document and only the record number and so it is unnecessary to obtain the patient permission.

Health care facilities receive and respond to numerous requests for information from the health records in their custody. A written permission is requires to release the clinical information which is considering as confidential. These data include all items in the record relating to the patient's diagnosis and treatment and it is highly confidential. Many health care facilities consider due information as confidential and needs permission from the patient for the release must be granted by permission from the patient or by law. Release of information from the health record shall be carry out in accordance with all applicable legal, accrediting and regulatory agency requirements, and accordance with written institutional policy. All information contained in the health record is confidential and the release of information will be closely control. A properly completed and signed by authorization is required for release of all health information except the following.

- As required by law.
- For release to another health care provider currently involved in the care of the patient and for medical care evaluation.
- For research and education in accordance with conditions specified below:

Information released to authorization individuals/ agencies shall be strictly limited to that information required to fulfill the purpose stated on the authorization. Authorizations specifying any information or other such broadly inclusive statements should not be honors. Release of information, which is not essential to the stated purpose of the request, specifically prohibited.

Medico legal cases

A great change has come about the attitude of the public towards hospitals and doctors in recent years and they have an increasing tendency to sue. For this reason, the medical record officer and the medical record committee must analyze each medical record carefully to see that it substantiates all aspects of medical record. Because the medical record has both medical and legal aspects the medical record officer and the medical record committee and others employed in the care and safekeeping of medical record, should be familiar with the principle and administration of low applicable to them.

Indian evidence act of 1872, page 22, chapter-5(amended up to august 1, 1952, 1961) clarifies the admissibility of medical record as a medical, legal and confidential document and it can be produce as documentary evidence whenever necessary. In this act, "document" means any matter expressed or described upon by substance of means of letters, figures or marks or by more than one of those means intended to be used for the purpose of recording matter.

The following types of cases are using evidence from medical records:

- Insurance cases
- Workmen's compensation cases
- Personal injury or road traffic accident cases
- Malpractice or medical negligence
- Will cases
- Dying declaration
- LAMA- leaving against medical advice
- Absconding
- Consents
- Implied consents
- Certificate of birth and death
- Criminal cases

Insurance cases

Frequent requests come from the life insurance companies regarding the claims that may have arisen for settlement as the patient insured with the company. With the help of medical record, various forms of life insurance are completed. Though the information that made available from medical record is a privileged communication and the document in this respect is use as a personal document, yet the release of such information without the prior consent of the patient is permissible. It is because the patient has waived his claim of this privilege at the time of taking out a policy with the company.

Workmen's compensation cases

The workmen's compensation act of 1923 as amended up to 1942 provides for payment, by certain classes of employees to their workers of compensation of injury caused by accident arising out of and in the course of employment. A commissioner appointed under section 20 of the above act awards the compensation as prescribed in the act. A right from the onset is therefore of paramount importance. The medical record in such instances used as evidence to show the date, type and severity of injury, period of disability and prognosis.

Personal injury suits

In this type of suit, the claim made by the individual for damages sustained as the result of injuries, which were due to the fault or neglect of another. The patient may show extend of injuries, the treatment rendered and the duration of the care required. The medical record used to obtain the required data for this purpose.

Malpractice or medical negligence

Malpractice defined as want of reasonable care and skill or willful negligence on the part of a doctor, nurse or other staff of the hospital in the treatment of a patient to lead his bodily injury or to the loss of his life. An action for malpractice may bring against the hospital and its employees in a civil or criminal court. The hospital medical record is here used to show whether there was negligence and the treatment rendered was adequate and proper or otherwise.

Will cases

A patient may have made a will during his hospital stay. After the death of the patient, an attempt may be made to set the will aside by seeking to prove the patient was mentally incomplete. The record used here as evidence in such a case of shows the mental state of the patient at the time of making the will.

Dying declaration

A dying declaration is a statement made by a dying person as to the cause of his death or as to any circumstances of the transaction that resulted in his death. The dying declaration forms the sole basis of conviction if it is free from any kind of doubt and if it has been record in the manner as provided under the law. It should inspire full confidence in its truthfulness and correctness. Not recording of dying declaration will result in injustice because the victim being generally the only eyewitness in a serious crime, the exclusion of the statement would leave the court without a scrap of evidence. Its admissibility has been explained in the section 32 (1) of Indian Evidence Act. It is essential that the declaring person must be in a sound state of mind (compos mentis) at the time of making the declaration.

Leave against medical advice

If a patient being discharged against medical advice, the signature of patient or relative should be obtained in a prescribed form. The patient should also be informed of the consequences or risk involved and that the hospital and its employees will not be held responsible for any ill effects which may result. In the event that patient refuses to sign a release, the clinical record contain a statement signed by the physician and duly witnessed setting forth the circumstances, reasons and warning against the premature departure.

Absconding

Absconding refers to departure of a patient from a ward/ department without prior arrangement. In such cases, immediately report it to the nearby police station.

Consents

Consents are essential for investigations, examinations, anaesthesia procedures, operations, autopsy etc. The patient and relative should sign the consent. In the case of minor patient guardian is to be sign. In legal abortion cases, final opinion is by woman with respect to husband.

Implied consents

On emergency for life saving measures without prior consent procedures, investigations etc. can be done. However, make sure that relatives sign the consent after procedures.

Certificate of birth and death

Birth registration certificates provide information for the establishment of parentage, for proof of identity, for the proof of birth date for school entrance, insurance for licenses of many kinds, for proof of place as well as date of birth in establishing citizenship and other purposes.

Death registration certificates prove the death of a person for life insurance claims, sickness insurance claims, settlement of estates, circumstances, time date and place of death, etc.

Criminal cases

Hospital medical records used for the following types of criminal cases:

- In murder cases, to show that the death did or did not result of from natural causes.
- In assault to show the extent of injuries sustained.
- In mayhem (crime) cases, to prove the history given by the patient on admission and the character and extent of the injuries sustained.

- In rape cases to prove, the condition of prosecutrix on admission and her history of related admissions.
- In certain cases to prove deficient mental condition and to show that the defendant should be confined to an institute for the mentally ill or feebleminded rather than imprisoned in a penal institution.
- In conspiracy cases to show that, a fraud was perpetrated on a person being sued for damages.

Medico legal cases (MLC)

Medico legal cases are the cases are involved under section 39 of IPC. The following cases can be register as MLC:

- All accidents
- Serious injuries
- Burns (especially females within 7 years of marriage)
- Suspected or evident poisoning
- All motor vehicle accidents'
- All factory accidents
- Unnatural deaths
- Suspected or evident sexual assault
- Criminal abortions
- Asphyxial deaths
- Brought dead cases
- Cases referred from legal court
- Cases already registered as MLC

Procedure for medico legal cases

- Affix the MLC rubber stamp when the medico legal case sheets and medico-legal reports received from the casualty. Check the medico-legal report duly filled in.

- Send the medico legal information to the police along with one copy of the medico-legal report.
- Inform the police station regarding the admissions, discharges and deaths.
- Attend the court after obtaining permission from hospital authorities and produce records in the court of law as and when summons (subpoena) received. In case, records have to be produced, make entry in the prescribed register, regarding number of sheets, number of laboratory investigation reports and other investigation reports, summon number, asked by whom how dispatched etc.
- Keep all the medico-legal documents in the safe custody under the lock and key. The lock should seal and the key should keep with the medical records officer.

Indian laws related to medical records

There some laws under Indian law related to medical records and hospitals. They are:

- Indian evidence act- 1872
- Income tax act- 1922
- Workmen compensation act- 1923
- Medical council act - 1956
- Consumer protection act- 1986
- Right to information act- 2005

Medical audit

Definition

The systematic review of elements of clinical care against predetermined criteria, with the aim of identifying areas for improvement and then developing, implementing and evaluating strategies intended to achieve that improvement. It involves systematically looking at the procedures used for diagnosis, care and treatment, examining how associated resources are used and investigating the effect care has on the outcome and quality of life for the patient

The benefits of clinical audit are that it:

- identifies and promotes good practice and can lead to improvements in service delivery and outcomes for users
- can provide the information you need to show others that your service is effective (and cost-effective) and thus ensure its development
- provides opportunities for training and education
- helps to ensure better use of resources and, therefore, increased efficiency
- It can improve working relationships, communication and liaison between staff, staff and service users, and between agencies.

The overarching aim of clinical audit is to improve service user outcomes by improving professional practice and the general quality of services delivered

Background

Clinical audit is a cyclical process where individuals, teams or services:

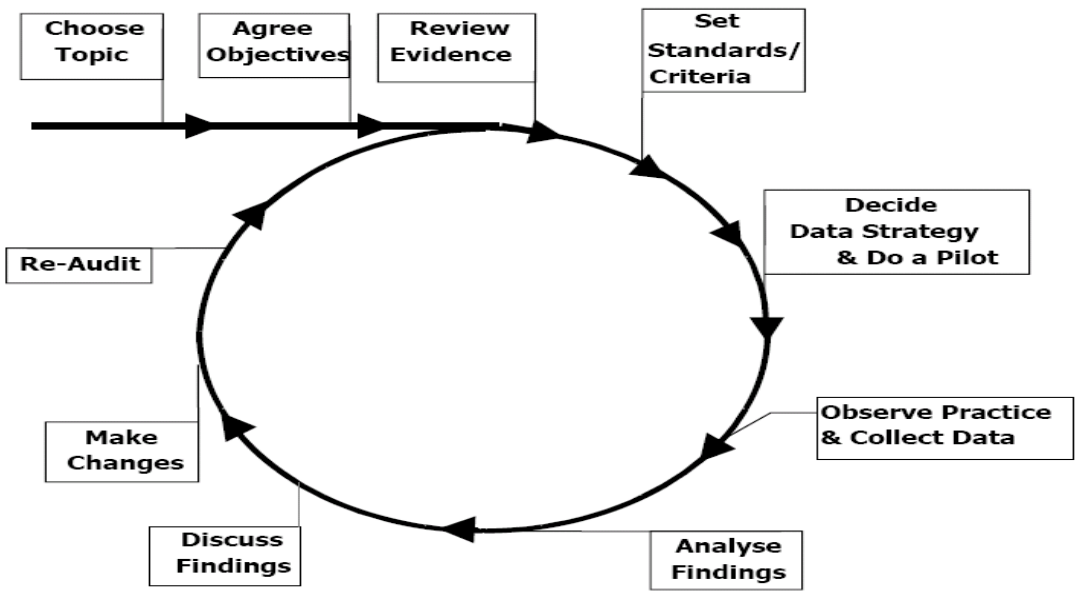
- Identify a clinical topic of interest or concern.
- identify sources of appropriate data, which will assist in assessing the topic, including medical records and feedback from senior doctors, other clinicians and consumers
- review the data against set criteria and standards
- identify areas for improvement
- implement those improvements
- Assess the impact of those improvements.

Audits measure elements of care including structure, processes and potentially outcomes of care. Clinical audit can provide information about the quality of care provided in a narrowly defined clinical area (for example, a single disease state or a single presentation). Successful clinical audit requires:

- a clearly defined issue or problem
- an ability to measure clinically relevant elements of care which clearly reflect that problem
- an ability to apply that measure in a rigorous and consistent way which best reflects patient care
- an ability to change care processes to drive any subsequent improvement in the chosen measure
- sufficient resources to ensure that the work can be undertaken appropriately and in a manner which ensures clinician engagement and support
- A good and efficient clinical leadership

Audit cycle

The process is set out in the audit cycle:



Critical risks to consider in using the tool

Clinical audit will fail if key barriers are not addressed prior to the commencement of the audit process. Key barriers include:

- Lack of clarity re purpose of audit (what are we trying to achieve?) – audit must be framed around improving patient care and has no role as an investigational tool
- inconsistent approaches to data collection and management
- insufficient resources to support the audit process
- lack of expertise in audit project design and analysis
- lack of planning
- lack of medical engagement and leadership
- poor professional culture and poor relationships between professional groups and agencies, and within audit teams
- absence of trust between senior doctors and managers
- lack of integration with other activities (including clinical governance processes)
- An inability of senior doctors to change or improve the care processes being measured

Organization and Management of Medical records department

Need and functions

Medical Records library is the pool and storehouse of health information. Every health care facility should have a proper place for lodging the medical records for storage and security. The medical records section should be logically located to facilitate easy transport of reports. The location of department should be in proper place to provide medical information to health care providers quickly.

Based on the storage of records there are two type of medical records libraries: Centralized and Decentralized. Centralization refers to filing of patient's files in one area. If outpatient clinic care regularly provided in a hospital is most practical. In decentralization filing system, files of different sections filed in different areas.

The medical record department identifies some specialized branch of hospital administration. It is concerned not only with the processing of a variety of clinical documents, but also a wider range of administrative procedures associated with patient activity in hospitals. Inpatient admission, discharge, maintenance of waiting list, outpatient department management, reception, registration, follow up procedures and statistics as well as training of medical records personnel are involved in the duties of medical records department.

functions

The major functions of the medical records department:

Registration of the patients

Each patient who came in health care facility should be registered before consulting with medical care providers. The important registration details usually recorded are name of the patient, father's/husband's/wife's/guardian's name, age, sex, religion, marital status, full postal address, occupation of the patient, facility or specialty in which he is registered, referral doctor's name and address, referral diagnosis etc. The medical records start in the registration office. An identification number is give to the patient at the time of registration, usually becomes the hospital number of that particular patient.

Admission

In the majority of the cases, the patient's first important contact is with the staff of the medical records department. The admission service is a division of the medical records department. The great extent the reputation of this department and the institution depends on the good well established at this point. Hence, the efficiency of the staff is very much required.

Censes

The hospital inpatient Census is the number of patients occupying beds in the hospital at the given time. The census taking hours generally specified as midnight because this period is usually the time of least activity in the admission and discharge of patients. If midnight is not a practical time, any other specified hour may be designated, but it should be the same hour for each day. The census may be compiled by the admitting /registration department, nursing service, medical records department; and it may be collected manually or by computer. If the census is done by computer, the necessary data like admission, discharge, and transfers are entered into the computer as they occur. During manual method of census, report from each nursing unit is sent to the department responsible for combing them into a complete master census.

Analysis

The medical records are to be analyzed for accounting daily admissions and discharges, age-wise, sex-wise and department-wise classification of patient, age group classification, paying bed and non-paying bed classification, treatment result, percentage of bed occupancy, bed turnover rate average stay of patient, mortality rates etc.

Assembling and deficiency check

The assembling and deficiency checking section collects the census and discharged records of the previous day and make entries in the respective registers. Arrange the records in the standard order and the deficiencies were marked. All the deficiencies are point out in the deficiency check sheet. The check sheet helped the doctor to complete the record during his weekly visit to the department with his team of doctors. The deficiency check sheet destroyed when the record is complete.

Coding

Diagnostic and procedural data can be classified in many ways, depending on the purpose of the classification system and use being made of it. The most efficient classification system for hospitals is one that yields adequate information about large numbers of inpatients and ambulatory care patients and permits retrieval of the maximum number of patient medical record with review of the minimum number of records. A perfect design for classifying diagnoses, surgical procedures and pertinent non-surgical procedures would anticipate every request for health data information and patient record retrieval in all hospital that use. Such a system has not been designed and may be impossible to attain.

Classification systems presently used in the health care field range from those statistical in nature to those that area catalogue of terms for describing and recording clinical, pathological or procedural terms. Although one classification system predominates in hospitals, medical record practitioners should familiar with the existence and purpose of other classification and listing systems designed for use in the health care field.

The International Classification of Diseases is a publication of the World Health Organization. Revisions are scheduled every ten years, and the 10th revision (ICD10) is nowadays used in hospitals. The ICD-9, Clinical modification (ICD9-CM) is also used in hospitals and state and federal agencies responsible for preparing vital statistics on births, deaths, and fetal deaths.

Medical coding is the transference of verbal descriptions of diseases, injuries, procedures and surgeries into numerical designations, which is an exact translation of the meaning of diagnosis according to some established criteria. Placing of a diagnosis in a class or group of diagnoses related to each other is called classification.

Classification systems used to organize the health care data for easy and meaningful retrieval. Coding is performed to meet internal and external demands for medical information. Third party payers and outside agencies use this information to forecast health care data, evaluate utilization of health care facilities and the appropriateness of health care costs and conduct epidemiological studies.

Indexing

Hospital maintain various indices and registers so that patient medical records and other information can be located and classified for patient care purposes, case studies, utilization management and other administrative purposes and for compliance with state regulations or licensure requirement. The various indices are the Master Patient Index (MPI), Disease and Operation Index (DOI), Physician Index (PI), other special indices etc.

Management of medical records department

Management is the effective utilization of resources toward the accomplishment of specific objectives. The basic components of management are effectiveness, functions, resources, and objectives. Organizing is the management function of distributing or allocation resources towards the accomplishment of the objectives defined in the plans. Organizing requires an understanding of the concepts of staffing and work distribution. Organizing, however, also includes the allocation of material, machine and space resources. Organization of a good, smooth running and efficient department is very hard task. Before starting a department, there should be proper perception about the hospital and its coming future. Following are very important matters in the case of organization of department. There should be a medical record manager for guidance and

supervision. The following points to be consider regarding the organization of the medical records department.

Planning

Planning is the most important function, yet often the most neglected. Planning may be simple and informal. There should be proper planning about its location, facilities, staffing etc. the centralized medical record department is more preferred. The department should be in a logically locate to facilitate the transport of files to various sections. The outpatient department must organize near the reception. All the investigations, accounting facilities etc. should be available near the outpatient department. There should be proper guidance to near the outpatient department. There should be proper guidance to patients for which name boards should be place. In the medical record department, there should be enough space to files the records properly and its easy retrieval. The racks must be arranged in such a way that the filing clerks can pull out records without using a ladder, which saves time and work. Adopt filing methods to satisfy hospital needs. The nature of filing and numbering pattern etc. should be plan before starting a department. Planning of the department based on the need of a hospital.

Organizing

There should be adequate staff for the smooth running of the department. The department needs more staffs if the outpatient department's case files are also used. Based on the outpatient departments the number of staffs increases. Computerization reduces staff strength and filing works. During work into sections and then coordinating the sections is one of the aspects of organizing. Each section must be assigned responsibility for certain tasks and be given the authority to see tasks to their completion.

Directing

The directing function of management involves getting all members of a work group to contribute effectively and efficiently to the achievement of the organization objectives. The scientific approach of directing, using pools of work simplification or methods engineering, and the humanistic aspects of actuating, including, leadership, motivation, communication, appraising employee performance, developing employee skills and appropriately compensating productivity and performance.

Staffing

The number of staffs required for the medical records department depends on the nature of tasks taken by it. The allocation of work among staff has evenly distributed. There should be enough staff for the smooth functioning of the department. Computerization reduces staff strength and it needs computer experts. The staffs should be courteous with all other staffs and supervisors. It is the responsibility of the supervisor to evaluate the performance of all the staff and give instructions whenever necessary. For 500 bedded hospital, there requires one supervisor, two assistants and one filing clerk, one coding and correspondence clerk and one helper. The staffing pattern differs from hospitals to hospitals according to the need of the medical record department.

Controlling

Controlling is the feedback mechanism for planning. Controlling is determining whether the planning has been effective, whether objectives have been met and taking steps to ensure that objects are met. Controlling requires an understanding of what is necessary to meet the standards defined in the objectives.

Evaluation

The hospital management committee and the medical record committee should evaluate the functioning of medical record department. For

effective management, the result of evaluation must be studied and take necessary action in consultation with health care director.

Assessment and modification

The medical record manager should constantly monitor the effectiveness of the medical records department frequently in order to take steps to improve it. For the betterment of the department, necessary modifications can be made without hurt other functions of the department.

Electronic medical records

Introduction

An electronic medical record (EMR) refers to the systematized collection of patient and population electronically stored health information in a digital format. These records can be shared across different health care settings. Records are shared through network-connected, enterprise-wide information systems or other information networks and exchanges. EHRs may include a range of data, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, personal statistics like age and weight, and billing information.

EMR systems are designed to store data accurately and to capture the state of a patient across time. It eliminates the need to track down a patient's previous paper medical records and assists in ensuring data is accurate and legible. It can reduce risk of data replication as there is only one modifiable file, which means the file is more likely up to date, and decreases risk of lost paperwork. Due to the digital information being searchable and in a single file, EMR's are more effective when extracting medical data for the examination of possible trends and long term changes in a patient. Population-based studies of medical records may also be facilitated by the widespread adoption of EMR's.

Manual medical record verses EMR

Governments, insurance companies and other large medical institutions are heavily promoting the adoption of electronic medical records. Electronic medical record system may improve overall efficiency by 6% per year, and the monthly cost of an EMR may (depending on the cost of the EMR) be offset by the cost of only a few "unnecessary" tests or admissions. So this system is less expensive than manual one.

The increased portability and accessibility of electronic medical records may also increase the ease with which, they can be accessed and stolen by unauthorized persons or unscrupulous users versus paper medical records.

Handwritten paper medical records may be poorly legible, which can contribute to medical errors. Pre-printed forms, standardization of abbreviations and standards for penmanship were encouraged to improve reliability of paper medical records. Electronic records may help with the standardization of forms, terminology and data input. Digitization of forms facilitates the collection of data for epidemiology and clinical studies.

EMRs can be continuously updated. If the ability to exchange records between different EMR systems were perfected (interoperability) would facilitate the co-ordination of health care delivery in non-affiliated health care facilities. In addition, data from an electronic system can be used anonymously for statistical reporting in matters such as quality improvement, resource management and public health communicable disease surveillance.

Technical features

- Digital formatting enables information to be used and shared over secure networks
- Track care (e.g. prescriptions) and outcomes (e.g. blood pressure)
- Trigger warnings and reminders
- Send and receive orders, reports, and results.
- Technical and social framework that enables information to move electronically between organizations
- Reporting to public health
- E-Prescribing
- Sharing laboratory results with providers

Quality

Several studies call into question whether EMRs improve the quality of care. However, a recent multi-provider study in diabetes care, published in the New England Journal of Medicine, found evidence that practices with EMR provided better quality care. EMR's may eventually help improve care coordination. An article in a trade journal suggests that since anyone using an EMR can view the patient's full chart that it cuts down on guessing histories, seeing multiple specialists, smoothest transitions between care settings, and may allow better care in emergencies. EMRs may also improve prevention by providing doctors and patients' better access to test results, identifying missing patient information, and offering evidence-based recommendations for preventive services.

Privacy concerns

Privacy concerns in healthcare apply to both paper and electronic records. Records that are exchanged over the Internet are subject to the same security concerns as any other type of data transaction over the Internet.

Legal issues

EMRs also considered as the legal document and it can be use for legal purposes.

Indian context

The Government of India, while unveiling of National Health Portal, has come out with guidelines for EMR standards in India. The document recommends set of standards to be followed by different healthcare service providers in India, so that medical data becomes portable and easily transferable.

India is considering to set up a National e-Health Authority (NeHA) for standardization, storage and exchange of electronic health records of patients as part of the government's Digital India programme. The authority, to be set up by an Act of Parliament will work on the integration of multiple health IT systems in a way that ensures security, confidentiality and privacy of patient data. A centralized electronic health record repository of all citizens, which is the ultimate goal of the authority, will ensure that the health history and status of all patients would always be available to all health institutions. Union Health Ministry has circulated a concept note for the setting up of NeHA, inviting comments from stakeholders.

Telemedicine

Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. It helps eliminate distance barriers and can improve access to medical services that would often not be consistently available in distant rural communities. It also used to save lives in critical care and emergencies. Although there were distant precursors to telemedicine, it is essentially a product of 20th century telecommunication and information technologies. These technologies permit communications between patient and medical staff with both convenience and fidelity, as well as the transmission of medical, imaging and health informatics data from one site to another.

Early forms of telemedicine achieved with telephone and radio have been supplemented with video-telephony, advanced diagnostic methods supported by distributed client/server applications, and additionally with Tele-medical devices to support in-home care.

Benefits and drawbacks

Telemedicine can be beneficial to patients living in isolated communities and remote regions, who can receive care from doctors or specialists far away without the patient having to travel to visit them. Recent developments in mobile collaboration technology can allow healthcare professionals in multiple locations to share information and discuss patient issues as if they were in the same place. Remote patient monitoring through mobile technology can reduce the need for outpatient visits and enable remote prescription verification and drug administration oversight, potentially significantly reducing the overall cost of medical care. Telemedicine can also facilitate medical education by allowing workers to observe experts in their fields and share best practices more easily.

Telemedicine also can eliminate the possible transmission of infectious diseases or parasites between patients and medical staff. This is particularly an issue where MRSA is a concern. Additionally, some patients who feel uncomfortable in a doctor's office may do better remotely. For example, white coat syndrome may be avoided. Patients who are homebound, and would otherwise require an ambulance to move them to a clinic are also a consideration.

The downsides of telemedicine include the cost of telecommunication and data management equipment and of technical training for medical personnel

who will employ it. Virtual medical treatment also entails potentially decreased human interaction between medical professionals and patients, an increased risk of error when medical services are delivered in the absence of a registered professional, and an increased risk that protected health information may be compromised through electronic storage and transmission. There is also a concern that telemedicine may actually decrease time efficiency due to the difficulties of assessing and treating patients through virtual interactions; for example, it has been estimated that a teledermatology consultation can take up to thirty minutes, whereas fifteen minutes is typical for a traditional consultation. Additionally, potentially poor quality of transmitted records, such as images or patient progress reports, and decreased access to relevant clinical information are quality assurance risks that can compromise the quality and continuity of patient care for the reporting doctor. Other obstacles to the implementation of telemedicine include unclear legal regulation for some telemedical practices and difficulty claiming reimbursement from insurers or government programs in some fields.

Another disadvantage of telemedicine is the inability to start treatment immediately. For example, a patient suffering from a bacterial infection might be given an antibiotic hypodermic injection in the clinic, and observed for any reaction, before that antibiotic is prescribed in pill form.

Types

Categories

Telemedicine can be broken into three main categories: store-and-forward, remote monitoring and (real-time) interactive services.

Store-and-forward telemedicine: it involves acquiring medical data (like medical images, biosignals etc.) and then transmitting this data to a doctor or medical specialist at a convenient time for assessment offline. It does not require the presence of both parties at the same time. Dermatology (teledermatology), radiology, and pathology are common specialties that are conducive to asynchronous telemedicine. A properly structured medical record preferably in electronic form should be a component of this transfer. A key difference between traditional in-person patient meetings and telemedicine encounters is the omission of an actual physical examination and history. The 'store-and-forward'

process requires the clinician to rely on history report and audio/video information in lieu of a physical examination.

Remote monitoring: Also known as self-monitoring or testing, enables medical professionals to monitor a patient remotely using various technological devices. This method is primarily used for managing chronic diseases or specific conditions, such as heart disease, diabetes mellitus, or asthma. These services can provide comparable health outcomes to traditional in-person patient encounters, supply greater satisfaction to patients, and may be cost-effective

Interactive telemedicine: This service provides real-time interactions between patient and provider, to include phone conversations, online communication and home visits. Many activities such as history review, physical examination, psychiatric evaluations and ophthalmology assessments can be conducted comparably to those done in traditional face-to-face visits. In addition, "clinician-interactive" telemedicine services may be less costly than in-person clinical visit.

Emergency telemedicine

Common daily emergency telemedicine is performed by SAMU Regulator Physicians in France, Spain, Chile and Brazil. Aircraft and maritime emergencies are also handled by SAMU centers in Paris, Lisbon and Toulouse.

A recent study identified three major barriers to adoption of telemedicine in emergency and critical care units. They include:

- regulatory challenges related to the difficulty and cost of obtaining licensure across multiple states, malpractice protection and privileges at multiple facilities
- Lack of acceptance and reimbursement by government payers and some commercial insurance carriers creating a major financial barrier, which places the investment burden squarely upon the hospital or healthcare system
- Cultural barriers occurring from the lack of desire, or unwillingness, of some physicians to adapt clinical paradigms for telemedicine applications

General health care delivery

The first interactive telemedicine system, operating over standard telephone lines, designed to remotely diagnose and treat patients requiring cardiac resuscitation (defibrillation) was developed and launched by an American company, Med Phone Corporation, in 1989. A year later under the leadership of its President/CEO S Eric Wachtel, Med Phone introduced a mobile cellular version, the MDPhone. Twelve hospitals in the U.S. served as receiving and treatment centers.

Tele monitoring is a medical practice that involves remotely monitoring patients who are not at the same location as the health care provider. In general, a patient will have a number of monitoring devices at home, and the results of these devices will be transmitted via telephone to the health care provider. Tele monitoring is a convenient way for patients to avoid travel and to perform some of the more basic work of healthcare for themselves.

In addition to objective technological monitoring, most Tele monitoring programs include subjective questioning regarding the patient's health and comfort. This questioning can take place automatically over the phone, or Tele monitoring software can help keep the patient in touch with the health care provider. The provider can then make decisions about the patient's treatment based on a combination of subjective and objective information similar to what would be revealed during an on-site appointment.

Some of the more common things that Tele monitoring devices keep track of include blood pressure, heart rate, weight, blood glucose, and hemoglobin. Tele monitoring is capable of providing information about any vital signs, as long as the patient has the necessary monitoring equipment at his or her location. Depending on the severity of the patient's condition, the provider may check these statistics on a daily or weekly basis to determine the best course of treatment.

Partap Chauhan, an Indian Ayurvedic doctor and the Director of Jiva Ayurveda, established the first Ayurvedic telemedicine center in India in 2007. Tele doc used Nokia phones running Java script to link mobile Ayurvedic field techs with doctors in the Jiva Institute clinic; at its peak, Tele doc reached about 1,000 villagers per month in Haryana province, primarily treating chronic diseases such as diabetes.

Monitoring a patient at home using known devices like blood pressure monitors and transferring the information to a caregiver is a fast-growing emerging service. These remote monitoring solutions have a focus on current high morbidity chronic diseases and are mainly deployed for the First World. In developing countries, a new way of practicing telemedicine is emerging better known as Primary Remote Diagnostic Visits, whereby a doctor uses devices to remotely examine and treat a patient. This new technology and principle of practicing medicine holds significant promise of improving on major health care delivery problems, in for instance, Southern Africa, because Primary Remote Diagnostic Consultations not only monitors an already diagnosed chronic disease, but also has the promise to diagnose and manage the diseases patients will typically visit a general practitioner for.

Tele-neuropsychology

Tele-neuropsychology is the application of Tele-health-based communications (i.e., video teleconferencing) to neuropsychological services. This includes remote neuropsychological consultation and assessment, wherein patients with known or suspected cognitive disorders are evaluated using standard neuropsychological assessment procedures administered via video teleconference (VTC) technology. Initial studies support the feasibility and reliability of this assessment medium when using a brief battery of standard neuropsychological tests of orientation, attention, episodic memory, language, and visual-spatial skills in older adults with and without cognitive impairment. Research comparing results from VTC versus traditional face-to-face neuropsychological testing suggests good reliability on most tests studied to date, although remote administration of certain measures requiring nonverbal manipulative may require procedural modifications which may have an impact upon test results and clinical interpretation. While promising, additional studies are needed with more neuropsychological measures in various populations to further document the validity of this assessment medium.

Tele-nursing

Tele nursing refers to the use of telecommunications and information technology in order to provide nursing services in health care whenever a large physical distance exists between patient and nurse, or between any numbers of

nurses. As a field, it is part of Tele-health, and has many points of contacts with other medical and non-medical applications, such as Tele-diagnosis, Tele-consultation, Tele-monitoring, etc.

Tele-nursing is achieving significant growth rates in many countries due to several factors: the preoccupation in reducing the costs of health care, an increase in the number of aging and chronically ill population, and the increase in coverage of health care to distant, rural, small or sparsely populated regions. Among its benefits, Tele-nursing may help solve increasing shortages of nurses; to reduce distances and save travel time, and to keep patients out of hospital. A greater degree of job satisfaction has been registered among Tele-nurses.

Tele-pharmacy

Pharmacy personnel deliver medical prescriptions electronically; remote delivery of pharmaceutical care is an example of telemedicine. Tele-pharmacy is the delivery of pharmaceutical care via telecommunications to patients in locations where they may not have direct contact with a pharmacist. It is an instance of the wider phenomenon of telemedicine, as implemented in the field of pharmacy. Tele-pharmacy services include drug therapy monitoring, patient counseling, prior authorization and refill authorization for prescription drugs, and monitoring of formulary compliance with the aid of teleconferencing or videoconferencing. Remote dispensing of medications by automated packaging and labeling systems can also be thought of as an instance of Tele-pharmacy. Tele-pharmacy services can be delivered at retail pharmacy sites or through hospitals, nursing homes, or other medical care facilities.

The term can also refer to the use of videoconferencing in pharmacy for other purposes, such as providing education, training, and management services to pharmacists and pharmacy staff remotely.

Tele-rehabilitation

Tele-rehabilitation (e-rehabilitation) is the delivery of rehabilitation services over telecommunication networks and the Internet. Most types of services fall into two categories: clinical assessment (the patient's functional

abilities in his or her environment), and clinical therapy. Some fields of rehabilitation practice that have explored Tele-rehabilitation are neuropsychology, speech-language pathology, audiology, occupational therapy, and physical therapy. Tele-rehabilitation can deliver therapy to people who cannot travel to a clinic because the patient has a disability or because of travel time. Tele-rehabilitation also allows experts in rehabilitation to engage in a clinical consultation at a distance.

Most Tele-rehabilitation is highly visual. As of 2014, the most commonly used mediums are webcams, videoconferencing, phone lines, videophones and web pages containing rich Internet applications. The visual nature of Tele-rehabilitation technology limits the types of rehabilitation services that can be provided. It is most widely used for neuropsychological rehabilitation; fitting of rehabilitation equipment such as wheelchairs, braces or artificial limbs; and in speech-language pathology. Rich internet applications for neuropsychological rehabilitation (aka cognitive rehabilitation) of cognitive impairment (from many etiologies) were first introduced in 2001. This endeavor has expanded as a Tele-therapy application for cognitive skills enhancement programs for schoolchildren. Tele-audiology (hearing assessments) is a growing application. Currently, Tele-rehabilitation in the practice of occupational therapy and physical therapy is limited, perhaps because these two disciplines are more "hands on".

Two important areas of Tele-rehabilitation research are (1) demonstrating equivalence of assessment and therapy to in-person assessment and therapy, and (2) building new data collection systems to digitize information that a therapist can use in practice. Ground-breaking research in Tele-haptics (the sense of touch) and virtual reality may broaden the scope of Tele-rehabilitation practice, in the future.

Tele-trauma care

Telemedicine can be utilized to improve the efficiency and effectiveness of the delivery of care in a trauma environment. Examples include:

Telemedicine for trauma triage: using telemedicine, trauma specialists can interact with personnel on the scene of a mass casualty or disaster situation, via the internet using mobile devices, to determine the severity of injuries. They can provide clinical assessments and determine whether those injured must be

evacuated for necessary care. Remote trauma specialists can provide the same quality of clinical assessment and plan of care as a trauma specialist located physically with the patient.

Telemedicine for intensive care unit (ICU) rounds: Telemedicine is also being used in some trauma ICUs to reduce the spread of infections. Rounds are usually conducted at hospitals across the country by a team of approximately ten or more people to include attending physicians, fellows, residents and other clinicians. This group usually moves from bed to bed in a unit discussing each patient. This aids in the transition of care for patients from the night shift to the morning shift, but also serves as an educational experience for new residents to the team. A new approach features the team conducting rounds from a conference room using a video-conferencing system. The trauma attending, residents, fellows, nurses, nurse practitioners, and pharmacists are able to watch a live video stream from the patient's bedside. They can see the vital signs on the monitor, view the settings on the respiratory ventilator, and/or view the patient's wounds. Video-conferencing allows the remote viewers two-way communication with clinicians at the bedside.

Telemedicine for trauma education: some trauma centers are delivering trauma education lectures to hospitals and health care providers worldwide using video conferencing technology. Each lecture provides fundamental principles, firsthand knowledge and evidenced-based methods for critical analysis of established clinical practice standards, and comparisons to newer advanced alternatives. The various sites collaborate and share their perspective based on location, available staff, and available resources.

Telemedicine in the trauma operating room: trauma surgeons are able to observe and consult on cases from a remote location using video conferencing. This capability allows the attending to view the residents in real time. The remote surgeon has the capability to control the camera (pan, tilt and zoom) to get the best angle of the procedure while at the same time providing expertise in order to provide the best possible care to the patient.

Remote surgery

Remote surgery or Tele-surgery is performance of surgical procedures where the surgeon is not physically in the same location as the patient, using a robotic Tele-operator system controlled by the surgeon. The remote operator

may give tactile feedback to the user. Remote surgery combines elements of robotics and high-speed data connections. A critical limiting factor is the speed, latency and reliability of the communication system between the surgeon and the patient, though trans-Atlantic surgeries have been demonstrated.

Specialist care delivery

Telemedicine can facilitate specialty care delivered by primary care physicians according to a controlled study of the treatment of hepatitis C. Various specialties are contributing to telemedicine, in varying degrees.

Tele-cardiology

ECGs, or electrocardiographs, can be transmitted using telephone and wireless. Willem Einthoven, the inventor of the ECG, actually did tests with transmission of ECG via telephone lines. This was because the hospital did not allow him to move patients outside the hospital to his laboratory for testing of his new device. In 1906 Einthoven came up with a way to transmit the data from the hospital directly to his lab. See above reference-General health care delivery. Remotely treating ventricular fibrillation Med phone Corporation, 1989. One of the oldest known Tele-cardiology systems for Tele-transmissions of ECGs was established in Gwalior, India in 1975 at GR Medical college by Ajai Shanker, S. Makhija, P.K. Mantri using an indigenous technique for the first time in India. In addition, electronic stethoscopes can be used as recording devices, which is helpful for purposes of Tele-cardiology. There are many examples of successful Tele-cardiology services worldwide.

Tele-psychiatry

Tele-psychiatry, another aspect of telemedicine, also utilizes videoconferencing for patients residing in underserved areas to access psychiatric services. It offers wide range of services to the patients and providers, such as consultation between the psychiatrists, educational clinical programs, diagnosis and assessment, medication therapy management, and routine follow-up meetings.

Tele-radiology

Tele-radiology is the ability to send radiographic images (x-rays, CT, MR, PET/CT, SPECT/CT, MG, US...) from one location to another. For this process to be implemented, three essential components are required, an image sending station, a transmission network, and a receiving-image review station. The most typical implementation are two computers connected via the Internet. The computer at the receiving end will need to have a high-quality display screen that has been tested and cleared for clinical purposes. Sometimes the receiving computer will have a printer so that images can be printed for convenience.

The Tele-radiology process begins at the image sending station. The radiographic image and a modem or other connections are required for this first step. The image is scanned and then sent via the network connection to the receiving computer. Tele-radiology is the most popular use for telemedicine and accounts for at least 50% of all telemedicine usage.

Tele-pathology

Tele-pathology is the practice of pathology at a distance. It uses telecommunications technology to facilitate the transfer of image-rich pathology data between distant locations for the purposes of diagnosis, education, and research. Performance of Tele-pathology requires that a pathologist selects the video images for analysis and the rendering diagnoses. The use of television microscopy, the forerunner of Tele-pathology, did not require that a pathologist have physical or virtual "hands-on" involvement is the selection of microscopic fields-of-view for analysis and diagnosis.

Tele-pathology has been successfully used for many applications including the rendering histopathology tissue diagnoses, at a distance, for education, and for research. Although digital pathology imaging, including virtual microscopy, is the mode of choice for Tele-pathology services in developed countries, analog Tele-pathology imaging is still used for patient services in some developing countries.

Teledermatology

Teledermatology is a subspecialty in the medical field of dermatology and one of the more common applications of telemedicine and e-health. In teledermatology, telecommunication technologies are used to exchange medical information (concerning skin conditions and tumours of the skin) over a distance using audio, visual and data communication. Teledermatology can reduce wait times by allowing dermatologists to treat minor conditions online while serious conditions requiring immediate care are given priority for appointments. Applications comprise health care management such as diagnoses, consultation and treatment as well as (continuing medical) education.

The dermatologists Perednia and Brown were the first to coin the term "teledermatology" in 1995. In a scientific publication, they described the value of a Tele-dermatologic service in a rural area underserved by dermatologists.

Tele-dentistry

Tele-dentistry is the use of information technology and telecommunications for dental care, consultation, education, and public awareness in the same manner as Tele-health and telemedicine.

Tele-audiology

Tele-audiology is the utilization of Tele-health to provide audiological services and may include the full scope of audiological practice. This term was first used by Dr Gregg Givens in 1999 in reference to a system being developed at East Carolina University in North Carolina, USA. Givens, Balch and Keller accomplished the first Internet audiological test in 2000.

The first Transatlantic Tele-audiology test was performed in April 2009 when Dr James Hall tested a patient in South Africa from Dallas.

Tele-ophthalmology

Tele-ophthalmology is a branch of telemedicine that delivers eye care through digital medical equipment and telecommunications technology. Today, applications of Tele-ophthalmology encompass access to eye specialists for patients in remote areas, ophthalmic disease screening, diagnosis and monitoring; as well as distant learning. Tele-ophthalmology may help reduce disparities by providing remote, low-cost screening tests such as diabetic retinopathy screening to low-income and uninsured patients.

Advanced and experimental services

Tele-surgery

Remote surgery (also known as Tele-surgery) is the ability for a doctor to perform surgery on a patient even though they are not physically in the same location. It is a form of Tele-presence. Remote surgery combines elements of robotics, cutting edge communication technology such as high-speed data connections and elements of management information systems. While the field of robotic surgery is fairly well established, surgeons at the location of the surgery control most of these robots.

Remote surgery is essentially advanced telecommuting for surgeons, where the physical distance between the surgeon and the patient is immaterial. It promises to allow the expertise of specialized surgeons to be available to patients worldwide, without the need for patients to travel beyond their local hospital.

Video-telephony

Video-telephony comprises the technologies for the reception and transmission of audio-video signals by users at different locations, for communication between people in real-time. At the dawn of the technology, video-telephony also included *image phones,* which would exchange still images between units every few seconds over conventional POTS-type telephone lines, essentially the same as slow scan TV systems.

Currently video-telephony is particularly useful to the deaf and speech-impaired who can use them with sign language and also with a video relay service, and well as to those with mobility issues or those who are located in distant places and are in need of telemedical or Tele-educational services.

Health information technology

Health information technology (HIT) provides the umbrella framework to describe the comprehensive management of health information across computerized systems and its secure exchange between consumers, providers, government and quality entities, and insurers. Health information technology (HIT) is in general, increasingly viewed as the most promising tool for improving the overall quality, safety and efficiency of the health delivery system. Broad and consistent utilization of HIT will:

- Improve health care quality;
- Prevent medical errors;
- Reduce health care costs;
- Increase administrative efficiencies and
- Decrease paperwork; and
- Expand access to affordable care.

Interoperable HIT will improve individual patient care, but it will also bring many public health benefits including:

- Early detection of infectious disease outbreaks around the country;
- Improved tracking of chronic disease management; and
- Evaluation of health care based on value enabled by the collection of de-identified price and quality information that can be compared.

Medical records department in SCTIMST

Screening of referral letters

In SCTIMST, the role of MRD starts in the registration counter. As a referral hospital and a research institute only cardiology, cardiac surgery, neurology, interventional radiology and neurosurgery patient can registered here. Accident cases and other emergency cases cannot be register. When a patient came to registration, he must bring referral letter to this institute from a recognized doctor. He must write the patients name, age, sex, detailed diagnosis or symptoms, patient's present condition, why the patient referred to here, doctor's name, hospital/doctor's address etc. If the patient sends the referral letter to the institution by post, then all the referral letters passed to senior medical record officer, he screened the letters and arrange for sending an appointment to all the selected patients with time and date for registration and examination by post or email. This avoids the unnecessary repeated arrival of patients and overcrowding in the OPD's

Registration

New patients with appointment date and without appointment date first reports to Medico Social Worker with MRD's appointment letter in separate counters for Cardiology, Cardio-Thoracic-surgery, Neurology (Neurology includes Epilepsy cases, Kerala Registered Epilepsy pregnancy cases, Movement Disorder cases, neuromuscular cases, MNC, autism etc.), Neurosurgery, Interventional radiology(rehabilitation clinic, pain clinic).

The medico-social worker supplies a social data form to the them which contains, patient's full name with initial, correct age at registration time, sex, religion, occupation, names of father, mother, husband/wife, guardian (if applicable), permanent postal address (House name, Place, Post office, District, State, Postal pin code). Also includes monthly family income from all sources, nationality, telephone number/mobile number, eligibility for medical benefits if any, PAN number if tax payment, driving license number, passport number (must for foreign patients), name and hospital address /e-mail id of the doctor who referred the patient here. The patient or his close relative fills the registration data form and returned to medico social worker. Then MSW assess the patient

about his socio-economic status. After the assessment, MSW categorize the patient into paying and non-paying group.

The non-paying group is "A" many poor patients come under "A" group. Other groups are B1, B, C and D. Sometimes old patients of non- paying group changed to paying category during their review in this way. This system of categorizing is very helpful to poor patient.

Responsibility and duty of a Medical Record Assistant or Medical Record Trainee in the OP desk

The MSW gives the registration number, which is permanent to the particular patient, then MSW passes the registration form to MRD (there are two MRD sub divisions near to OPDs). The MRDs assistant feed the socio-economic details of the registered patients to the computer for opening a new medical record. An identification card is give to the patient, which includes Patient's registration date, Patient's name, age sex, category, and address with an instruction to bring the card on every visit. Then an outpatient record, referral letter, assessment sheet, social data form and patient's op small stickers are keeping together in a green folder (which indicates that it is an outpatient file only) and send to concerned OPD's. Doctors record the physical examination findings, diagnosis, investigation, and disposition of the patient in time. The patient must take next review date from the MRD after their check-up. Such medical records are analyzed by the MRA's to know the deficiency if any. International coding is doing for diagnosis and procedure for out patient's record.

Review

As explained the patients who need only further follow-up after an interval of particular period according to the severity of diagnosis are give a follow-up appointment by MRA, as per the availability of token in the computer as programmed. Appointment dates given by staggered basis to avoid overcrowding in OPD's. The appointment dates can be postpone when there is reasonable request from patients. MRO also postponed future admission dates for procedures and surgery in the same way.

Patients with appointment date first inform to the MSW for entering they have to do payment (for payment category only) for review. Then they have to report to MRD with appointment token computer print card. MRA receives the card and then asked them to wait in the OPD's. The concerned files then send to concerned OPD's. Although there is a definite number of appointments in each OPD's, but the patients may come in without appointment date on emergency they are consider as without appointment cases. The doctors in OPDs must say whether the patient is sick or not, then they writes the without slip, then the procedure is as same as that of with cases, that is the patient is send to the payment then asked them to inform the without issue to the information counter. The OP procedures starts just like the with appointment cases. After the review, all the new files and old files from concerned OPDs were collected in MRD. Then MRA has to check the return files, sort them numerically and send them back to filing desk in main MRD.

All patients under 18 years are under a scheme, RBSK (Rashtriya Bal Swasthya Karyakram). If a patient came who is under this scheme, MSW will a form in which the patients' guardian to enter the hospital number, age, date of birth, parent or guardians name and signature. After writing these things they have to go to OPDs. From there the doctor will enter the diagnoses and signature in that form. Then the patient come to MRD. The MRA include the patient under the scheme RBSK by entering the details in the form to the computer.

Admission

Not all the patients registered may require hospitalization on the day of registration. Due to limited bed strength, only serious patients are admitted on the same day and others will be given a date after an interval according to the seriousness of the disease. The patients to be admitting asked to do the advance payment. After that patient and relative is asked to be sign in admission record to get their consent to do all necessary treatments including surgery to them. Then the Inpatient procedure started. MRA should gather the changed patient data i.e. his present age at the time of admission and address. Additional information viz. telephone number of the bystander, local address etc. collected, by MRA from the patient or relatives. Moreover, no relatives (except babies or small children) permitted to stay with patients in the ward. All information fed to the computer.

The MRAs issues 2 permanent passes for one week to the bystanders, if the patient, stay more than one week they have to renew pass. At a time from 4pm- 6pm, two bystanders can visit the patient.

Filing Section

All the files from OPDs, wards (discharged files, inpatient's files), Files after study purpose and others are collected together. Here the files are check by an MRA, and sorted and serialized them in ascending order of their number. Then entered it in computer and filed. During filing, the chance of missing files is more. As a result, that chart cannot be traced out when the patient has come for review, so filing should be very careful and vigilant. In our institute, we are following unit-numbering system. Hence, the chance of misplaced files is low. Sometimes thin charts may incorporate with large one accidentally. Such charts cannot trace out easily. Sometimes charts may misplace due to the negligence OPD people. Anyway, in our institute chance of misfiling is very less. The MRA in filing desk duty should also take the next days with-appointment files from the filing racks, and should sent them to the OPDs after sorting into clinic wise (Cardiology, CVTS, Neurology, Neurosurgery, IS &IR). In addition, they must issue the without date files to the concerned OPDs.

Inpatient chart checking desk

Here in patient files after discharge are giving to the MRA. The quality of medical care rendered is check only through medical records. For maintaining accurate medical records, the following things are very important.

Check all medical records qualitatively and quantitatively and note the deficiencies. Then code the file based on ICD-9 for diagnosis and procedure. MRA should write all deficiency of that chart on a checklist then keep it in front of the IP file. Only completed medical records where stored in incomplete filing racks and respective personal upon call by Medical Records Officer completed it. If anybody seems to be disagree with the completion of files, first reminders was sent through corresponding heads of each departments, second through the Medical Superintendent and finally by Director. After completion, the IP files are taken to filing procedure.

Pruning

Pruning is the part of space management. Examine each record and remove all unimportant papers. Most of the forms in OP records like Op face sheet, continuing sheets, important lab reports, and socio-economic data sheet and referral letter kept as such. In in-patient records, the admission records, histopathology records, scanning records, death certificates and autopsy records always kept.

In SCTIMST, the retention period is ten years. All such files, were scanned and stored as soft copy. When such patients are come to hospital without taking prior appointment, the soft copies are issued. We had maintained a pruning register so that we can easily identify pruned files. Pruning provides necessary space so that we can file latest records.

Electronic medical records

Electronic medical records system is started in SCTIMST in this year from January. Now this system established only in cardiology department. The history and physical examination, diagnoses, investigation results are entered to the computer by doctor. The complete outpatient record is scanned and uploaded to the system by MRA. So when the patient came for review next time no need to take the OP file. It can be seen in systems in OPDs. All the with appointment review cases are now under EMR. The patient have to give their appointment cards to the EMR counter. The MRA in the counter receives the cards with their last prescription. And then enter the drugs they taken to the computer. After that the file is issued to the review OPD. There the consulting doctor enters the prescription in the computer and give a printout to the patient. Investigation reports of that day are send to MRD after consultation from OPD. These reports are collected, scanned and uploaded to the system.

Hospital statistics

Daily ward census: Daily ward census i.e. Number of patients present each day for given time is prepared by nursing staff in the ward census reporting form.

The census taking time is at midnight. Reporting forms are collected by night supervisor on duty and are handed over to MRD. The data contained is processed in the computer by medical records staff and a daily report is generated and presented to authorized concerned.

Monthly and annually reports: The monthly and annually statistical reports are generated by MRD and are circulated to hospital administrators and head of the departments. These reports provided comparative figures, which are valuable to the concerned to evaluate its own performance and the hospital administrators as a picture of professional performance of the hospital and medical staff. The aspects highlighted in the reports are:

- Service-wise classification
- Sex-wise analysis
- Age-wise analysis
- Paying and non-paying analysis
- Geographical analysis
- Service-wise death rate analysis
- In patient service-wise analysis
- In patient bed turnover rate
- Religion-wise analysis

A detailed list of death cases with cause of death and other data required is prepared monthly and circulated among all members of hospital management committee. The cause of death and other factors are discussed in the meeting and necessary measures are taken immediately. Statistics in relation to diagnosis, operation, operating surgeons, interventional procedures and other aspects demanded by residents, consultants, administrators and paramedical are provided at requirement.

Assisting Doctor's study

Postgraduate students need the support of MRD for their study and thesis presentation. It is the duty of medical record personnel to make the charts available for them according to diagnosis wise etc. and issuing necessary statistical information to them from the medical records. An average 10,000 are retrieved for this purpose every year. MRD saves the doctors, institution from the consumer protection council. Doctor-MRD does patients' correspondence.

Patient's certificates

Except Doctors Medical certificates for leave, all the following certificates are issued by SMRO.

- Financial assistance from Prime Minister's fund
- Financial assistance from Chief Minister's fund
- Financial assistance from organizations
- Estimate for advance from departments
- Train concession certificate
- Treatment certificate for telephone, electricity etc
- Attendance certificate

Standardized forms control

MRD maintains all medical record forms in a stock room an issue to the wards, ICUs and OPDs once in a month. Medical records committee's approval is required whenever a new form is to be introduced. SMRO who controls the consumption of it prepares annual indent. He issues the forms to all ward and OPDs once in a week according to the convenience of everybody.

Death reports to the corporation

Each and every hospital is responsible to send birth and death reports to corporation/municipality/panchayat in the scheduled period of 14 days for birth and 21 days for death. Thiruvananthapuram Corporation has supplied very detailed forms for sending those death reports to corporation. A cause of death certificate is given to patient's relatives for taking the dead body from this institute to their place. Recently corporation has introduced a new format in Malayalam additionally which shows the patients detailed data. Our MRD sends the death reporting forms promptly once in every 15 days with the signature of Medical Superintendent.

Discussion about the negligence, if any in death cases

Department heads prior to this meeting peruses the death charts. On the day of meeting, HOD explains the various reasons for each death happened in their department. Professor of pathology explains about the autopsy details if it has done associated with HODs. There will be cross-questions from everybody for which the HODs reply. If the death is due to negligence of anybody, the committee submits the report to the Director for disciplinary action against the culprit. It is done in the good interest of the institution for offering better treatment with the advanced facilities. The accurate medical record maintained in the MRD are the tools for evaluation the quality care rendered to patients. So far 150 medical audit are conducted in SCTIMST successfully

Prolonged stay in the ward and ICUs

HOD of the concerned department explains about the reasons for the prolonged stay of patients who are lying in the ward or ICUs more than 30 days.

Hospital Infection

The Professor of Microbiology who is the chairman of the infection committee explains the infection rate and the remedial steps taken.

Hospital Statistics

The SMRO explains the monthly hospital statistics viz. admission, discharges, mortality rate, length of stay etc. in each service.

Complaints and Suits

The complaints or suits against to doctors or institute if any will be brought to the notice of the committee members by SMRO and discusses in detail for necessary action.

My training period

I joined here on 1 January 2014 as trainee student, in Diploma in Medical Records Science. I got rigorous training in all fields and work places of the Medical Records Department of SCTIMST, which includes

- Outpatient management
- Admitting office management
- Census preparation and analysis
- Qualitative and quantitative analysis
- Statistical data preparation and presentation
- ICD coding
- Delinquent record control
- Filing area management
- Pruning and assembling of disoriented medical record forms
- Registration of vital events
- Medical record retrieval and retention
- Computerized appointment system with automatic token system
- Inactive record control and space management
- Incomplete control and reminders
- Surgical and procedural date scheduling
- Medical record forms control
- Medical records scanning and uploading

Outpatient department

In our hospital, MRD has two divisions in outpatient department, one cardiac side and another in neuro side. In my training period, I appointed in both sides. Here I did the following tasks:

- Feeding of socio economic data of new patients to the system
- Issuing of medical records of patients who came for review in various OPDs
- Issuing the computerized appointment tokens to the patients for their next review
- Assembling and coding of new medical records
- Sorting of medical records received from OPDs
- Procedures for the admission of patients
- Renewal of visiting passes, etc.

Filing

I have the training in filing section too. Here I studied the maintenance of a medical records library. We followed the unit numbering system. The duties in filing as a trainee are :

- Sorting of files came from OPDs, wards, disposed files from class room (study purpose) etc.
- Enter these files to computer as filed and arrange these files in appropriate filing racks
- Take files of patients who came for review
- Take files for the doctors, research students etc. for study purpose

In patient record analysis

- Assembling of records of discharged patients
- Checking of deficiencies
- Coding the diagnoses and procedures

Other works

- Assembling of disoriented old records
- Correspondence
- Pruning
- Scanning and uploading the records
- Emergency night call duty