Dedicated to

my father late

‘Shri Ekanath Hari

Gosavi’

who has been an

inspiration to me,

and also made me realize

the importance of

education, all

my life,

I wish every son gets a

ACKNOWLEDGEMENT

At the outset I thank that almighty, ***Lord KRISHNA****, for his abundant blessings and guiding light through out the study.*

I would also like to thank all those who have directly or indirectly helped me in caring out this dissertation work successfully.

My sincere thanks to ***Dr. V. D. Patil****, Principal, J. N. Medical College, Belgaum.*

I whole heartedly, like to thank ***Dr. M. V. Jali****, M.D. KLES Prabhakar Kore Hospital and Medical Research Center, Belgaum for having permitted me to carry out this dissertation work.*

I am grateful to my guide ***Dr. V. K. Dhulkhed*** *for his meaningful guidance to this dissertation work.*

My heart full of gratitude to ***Dr. Anil. P. Hogade****, Course Coordinator, for his timely advice and suggestions all the way.*

I would also like to thank ***Mrs. Sweta Agarwal****, Asst. Professor & Ms. Sona Raj, Lecturer for their kind cooperation through out the study work.*

I also like to thank the postgraduates and other ***staff of Anaesthesiology*** *department and the* ***staff of Medical Record's*** *Department.*

It, may not be fair on my part if I fail to thank all my classmates ***Mr. Milind, Dr. Veena, Miss. Geetarani, Miss. Nestila, Miss.Sushma, Miss. Mamata and Mrs.Shweta*** *for the cooperation extended by them in carrying out this dissertation work.*

Last but not the least I would like to thank my son ***Charudatt*** *for his valuable assistance in writing down this dissertation work.*

Narsinh Eknath Gosavi

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INTRODUCTION

Before we make an attempt to understand the topic, it is equally important for every one to know the meaning of the term "Audit" and "Anaesthesia".

AUDIT :

The term "Audit" is derived from a Latin word "Audire" which means, "to hear".

Every organization formal or informal in nature has a definite objective to achieve, and it would be very difficult to pronounce success without a proper and systematic approach towards it. Despite formulation of a definite strategy, as an administrator one would be more interested in ensuring that, the policies and procedures so designed are implemented and followed religiously at every level within an organization by keeping a continuous follow-up of feedback, not generated by a person from the department but by a professional who may either be an employee of the same organization or an external person, and such person is called as an Auditor.

Hypothetically, there are two types of audits, namely "Audit Under Statue" and "Management Audit". The topic under the current study falls in the second category i.e. "Management Audit"

As we all know that any hospital for that matter is an organization, which is invariably involved in providing health care activities that is many a time a life saving one. So as an administrator it is very important to keep a close vigil on all the activities within a hospital.

The systems medical audit will not only keep the management updated about the state of affairs in the hospital, but will also minimize the gap between thinkers and doers.

The principle aim of the audit is to improve the quality care provided to the patient. For e.g. by reducing unnecessary treatment, investigations, preventing iatrogenic diseases, and by identifying patients with continuing problems who have not been followed up.

Most audit coordinators consider that their local Anaesthesia chart adequately records details of Anaesthesia from staff involved. However answer to more detailed questions conflict with this picture when comparing information relating to Anaesthesia personnel that can be recorded on existing Anaesthesia chart desirable by audit coordinator, few charts, record grade, handover or details of supervision so there discrepancy between what can currently be recorded and what is seen desirable.

Audit is intended to provide reassurance to Physicians, Nursing staff, administrators and other health workers that quality service is achieved within the limits imposed by the resources available.

Clinical audit can be a valuable assistance to any programmer, which aims at to improve the quality of health care and delivery. Yet without a coherent strategy aimed at nurturing effective audit valuable opportunities will be lost. Paying careful attention to the professional attitude highlighted in this review may help audit to deliver on some of its promise.

Every hospital at any given point of time is relatively cost intensive, hi-tech activity and hence calls for a very high degree of attention towards capacity utilization, cost reduction, quality improvisation, patient satisfaction, minimizing labour turnover, interdepartmental relations and ultimately brand building process.

In this competitive world every hospital (health care services) would like to be ahead of the time and hence the first hand information reaching the management on time becomes the key to success, and to provide such a platform for a hospital (health care services), it is necessary to make a study on the topic stated above, to list out the set of deviations from the standards in terms of quality, quantity, compatibility etc.

ANAESTHESIA :

Anaesthesia has two objectives. The main one is to enable surgical procedures to be performed without pain. Secondly, modern Anaesthesia should also provide adequate protection from other ill effects of surgery, before, during and after the operation. The need for such Anaesthesia is, no doubt, worldwide.

Anaesthesia is a new medical science. The era of surgical Anaesthesia did not begin until approximately a century and a half ago. From the very beginning man sought various means to dull the morbid and even legal edge of pain, the archenemy of man. Opium, mandragora, alcohol and Cannabis indica were used by early surgeons to blunt the pain of surgery. Hypnosis or animal magnetism described by Anton Mesmer in 1779 was used to diminish the operative pain by James Esdaile in 1840 and James Braid in 1843. James Esdaile reported many surgical operations under mesmeric Anaesthesia done in a hospital of Hooghly in India. The advent of potent Anaesthetic drugs like ether and chloroform, however, diminished the used of hypnosis.

At the close of the eighteenth century, Joseph Priestly discovered oxygen and nitrous oxide. Sir Humphry Davy in 1800 experimented with nitrous oxide and suggested that its inhalation might be used to relieve pain of surgical procedures.

About 40 years later on 20th December 1844, a traveling chemist, Gardner Quincy Colton, demonstrated the effects of nitrous oxide in America at Hartford, Connecticut. Horace Wells a local dentist, was present there and noticed that a young man, Simpson Cooley, greatly exhilarated under the influence of nitrous oxide, was injured accidentally, but he stated later that he experienced no pain, whatsoever. Horace wells used it scientifically for painless extraction of teeth. Thus, the era of painless dentistry was established, and general Anaesthesia was to follow in its wake.

William Morton deserves the chief credit for the introduction of ether as an Anaesthetic agent in 1846. But this was preceded by C W Long's use of ether to remove a tumor from the neck of J M Venable in 1842 and this was followed by Simpson's use of Chloroform in Edinburgh in 1847. Queen Victoria was given chloroform at the birth of seventh son, Price Leopold. Chloroform became considerably popular in the part of nineteenth century and the word "Anaesthesia" even became synonymous with the word chloroform. But due to various adverse effects, its use is not in vogue in recent times.

In the early part of the twentieth century, various other volatile Anaesthetic agents constituted the Anaesthetist's armamentarium, The modern era of fluorinated Anaesthetic agents

is no doubt, of recent origin dating back to the early 1950's. Halothane was first used clinically by Johnstone in 1956 and methoxyflurane by Artusio and his co-workers in 1960. Recently various other volatile fluorinated Anaesthetic agents like enflurane (1972), isoflurane (1981), desflurane (1992), sevoflurane and fluroxene are also being used successfully.

Claude Bernard in 1884 discovered the essential physiological action of curare and arrow poison used by the South American Indians. Subsequently important advances were made in physiology and pharmacology by more so in clinical Anaesthesiology. Griffith and Johnstone in 1941 first used curare in Anaesthesia, and this agent paved the way for rapid advances. Thus, endotracheal anaesthesia introduced by Magill in 1920 was firmly established with the aid of muscle relaxants. The introduction of various muscle relaxants such as tubocurarine gallamine, suxamethonium, pancuronium, vecuronium, atracurium and so on also produced enormous expansion in techniques of anaesthesia. Recently the newer muscle relaxants like pipecuronium, doxacurium, rocuronium and mivacurium are in common use. Balanced anaesthesia introduced by Lundy in 1926 was also obtained by delicate balance of various agents and regional analgesia and general anaesthesia techniques.

In 1915 Dennis Jackson first used carbon-di-oxide absorption in anaesthesia, and the method was much improved by Waters in 1923. Artificial respiration by manual compression of a reservoir bag became popular, and the first respirator to take over the function of respiration was constructed by Crawford in 1938. With the introduction of relaxants, artificial respiration was universally employed and a large number of respirators were developed.

Anaesthesia machine and Anaesthetic breathing systems are greatly improved and lost of safety devices are incorporated. The most commonly used breathing circuits are Mapleson A system, Bain circuit and circle system. Vaporizers are also modernized and they are classified as agent specific, variable bypass, flow-over, temperature compensated, out of circuit vaporizers.

Considering the advances in anaesthesia, the greatest development seems to be in the art of resuscitation. The careful use of blood transfusion and other intravenous therapy, improved methods of using oxygen, and better ability to perform cardiac massage have rendered operation and survival possible in cases, which were almost impossible only a few years ago. Open-heart surgery, and even some organ transplantation have become common, easy and mostly safe in the last few years. The vast achievement in surgery is always synonymous with that of

anaesthesia. Regional analgesia is yet another field which allows painless surgery without producing unconsciousness. Karl Kollar, and ophthalmic surgeon, discovered the local analgesic action of cocaine in 1884. Since then research has been carried out to find the chemical that can act as a substitute in blocking the nerve conduction when applied locally.

Regional analgesia obtained by blocking the spinal nerves in the subarachnoid pace was actually introduced by Bier in 1898, and Pitkin popularized the technique in 1905. Epidural analgesia which blocks the spinal nerves in the epidural space was introduced by Corning in 1885 but was applied in clinical surgery by Pages in 1921 and by Dogliotti in 1931. The efficacy of opiods introduced into the subarachnoid space or epidural space for providing chronic pain relief and postoperative analgesia seems to be a great noteworthy advance in medicine.

Acupuncture for anaesthesia is of recent introduction, perhaps from 1958. Earlier it was mostly used for relief of pain and not in active anaesthesia for surgery. Acupuncture based on classical Chinese medicine, seems to be simple, safe and nontoxic and requires sophisticated instruments. But the method is not popular all over the world and it is still the subject of dispute. chronic pain relief and postgraduate

In modern times the growth and scope of anaesthesia has enormously expanded in logarithmic scale with the introduction of new drug, techniques, apparatus and equipment. In our country too, the magnitude of change, both in quality and quantity of anaesthesia has done up. Anaesthesia in our leading institutions today is easily comparable to the very best in the world. The pre-anaesthetic clinic used for consultation as to the suitability of the patient for anaesthesia and the pain clincia for proper management of patients with intractable pain are the two landmarks in the progress of anaesthetic speciality.

Monitoring, both invasive and non invasive in intraoperative period and in intensive care units a paramount importance and standards of monitoring have improved a lot in the last few years. Pulse oximeter, capnography, multiple gas analysis, thermometry, echocardiography, pulmonary artery catheterization and son on are now in common use. High quality monitoring increases the incidences of favourable outcome to the patient.

Today, Anaesthesiology is regarded as a major practice of medicine. The scope of Anaesthesiologist has broadened significantly even outside the operation theatre. He is now concerned with various problems in medical wards, intensive care units and in pain clinics, over and above his activities in operating

rooms and in the field of after-care of surgical patients. The management of fluid therapy, blood transfusion problems, the supervision of inhalation therapy and resuscitation including resuscitation of the newborn are some of the services concerned with the Anaesthesiologist's to perform. Since the epidemic of poliomyelitis in Copenhagen in 1953, Anaesthetist's have been taking full responsibility for patients suffering from respiratory insufficiency. Anaesthesiologist's are better concerned with the evaluation of respiratory function and application of respiratory therapy in all its forms.

The efficacy of closed chest cardiac massage by the chest compression introduced by Kouwenhoven and his associates in 1960 and expired air or mouth-to-mouth resuscitation by Safar and others in 1958 are now well recommended as the preference first aid methods for performance of cardio pulmonary resuscitation. Anaesthesiologist's are now involved in treating all aspects of cardiopulmonary arrest including basic life support and advanced cardiac life support. The clinical management and teaching of cardiac and pulmonary resuscitation are now in the domain of this particular branch of medicine, Anaesthesiology. They also have and important role to play in education the lay public in different techniques of basic life support.

Anaesthetists are often facing with various types of crisis management and they have to tackle the unpredictable, uncertain and dynamic situations and make complex medical judgments during critical patient care. They carry full professional responsibilities and liabilities with its medico legal implications. The ultimate goal is to utilize their specialized knowledge, skill and experience to help the patient care and to ensure the patient's safety.

Anaesthetist's are today better consulted in the management of various drug poisoning cases such as barbiturate, narcotic intoxification, in maintaining pulmonary ventilation and in the treatment of life threatening diseases like status epilepticus, status asthmaticus, eclampsia, tetanus, poliomyelitis, myasthenia gravis and so on. In this respect the Anaesthetist seems to be better physician with fair surgical and medical knowledge and a good physiologist and pharmacologist with super specialized technical ability and skill.

The scope of Anaesthesiology further extends to include extensive research works at all levels – the clinical and basic science levels to explain and improve the care of patients. In recent years such research works in all aspects of anaesthesia are noteworthy but much remains to be advanced and improved.

NEED FOR STUDY :

The hospitals are the key institutions of the health care delivery system that provide healthcare services to the patients. In this modern era every hospital in likes to be ahead of the time and hence the first hand information reaching the management on time becomes the key to success, and to provide such a platform for a hospital, it is necessary to make a study on the topic stated above, to list out the set of deviations from the standards in terms of quality, quantity, compatibility etc.

This prompts any one to carryout a systems medical audit in the Department of Anaesthesiology in KLES Prabhakar Kore Hospital and MRC Belgaum.

OBJECTIVE OF THE STUDY

The objective of the study is :

- To assess the significance of existing medical care system with regard to infrastructure, technology, human resources and other related activities and its leverage on ultimate objectives of Anaesthesia department.

REVIEW OF LITERATURE

"A physician who fails to enter the body of a patient with the lamp of knowledge and understanding can never treat diseases…" This remark appears somewhat rudimentary today, but Charaka made it in 2000 years ago in his famous Ayurvedic Treatise, "Charaka-Samhita". [1]

Physicians the world over have undoubtedly always been critically examining their work. The most ancient historical document emphasizing the responsibilities of physicians and the concept of quality of care provided dates back to 2000 BC and the Code of King Hammurabi of Babylon. Inscribed on a 7.5 feet block of diorite that is housed in the Louvre Museum in Paris are the earliest known documented penalties for incompetent practice. The code of Hammurabi also contains the earliest known listing of charges for service, thereby incorporating the quality and cost of medical care.

In classical Greece, Hippocrates required pupils to swear that the care administered to patients by them would always be to the best of their ability. The Hippocratic oath in its modified form is still required to be taken by the medical students on their graduation.

By the time of the renaissance a commonly practiced "Oath of Physicians" in Europe pledged that physicians would "prescribe regimens for the good of my patients according to my ability and my judgement and never do harm to anyone….".

Interest in the medical audit was first highlighted after the publication of Flexner report in the year 1910, which revealed appalling conditions in many of the American and Canadian Medical Schools. [2]

It was the beginning of a new philosophy of revolution in-patient care in the hospitals when in the summer of 1910, two surgeons, Dr. Eariest Emery Codman of Boston and Dr. Edward Martin of Philadelphia were riding in a hansom through the countryside in England. Dr Codman was explaining what he called his "End result system of hospital organization" to Dr. Martin. He described it as "merely the common sense notion that every hospital should follow every patient it treats, long enough to determine whether or not the treatment has been successful, and then to inquire "if not, why not?" with a view of preventing similar failure in the future. Dr. Martin seized his idea and responded that the he thought Dr. Codman's system was one of the important reasons why an American College of Surgeons should be established. [3]

In New York, 1912 Margaret Sanger, a birth control advocate and at the time a visiting nurse on Manhattan's Lower East Side was distressed with the "Pungent sting" of antiseptics which hardly "obscured the stench" of the maternal death that was an all too frequent occurrence in the city. The significance of maternal death like the abortion that had initiated septicemia for one of the Sanger's patients, remained hidden in the webs of social and medical discourse of the day, where few midwives, physicians or obstetricians recognized its significance. Over the following two decades the issue of maternal death increasingly became a part of the central argument. Ransom S Hooker, medical school professor and the New York Obstetrical Society on maternal mortality in New York City directed a study. All maternal deaths in the city were interviewed. A medical committee whose primary objective was to establish whether using "the best possible skill in diagnosis and treatment which the community could make available" then reviewed each case – each maternal death was preventable. This highlighted the role of understanding the causes and preventability of maternal deaths and expanded professional role for specialized physicians. The official release of the report was announced in the "New York Times" on 20th November 1933. A front-page headline concluded, "The Medical Academy Report blames doctors for 61 percent of such mortality". And on 22 February 1934 "The Times"

published: “The hazards of child birth in New York City are greater than they need be. Responsibility for reducing them rests with the medical profession”. [4]

In 1918, Dr. Geogre G Ward, a noted gynecologist at the Women’s Hospital in New York, gave a consideration to the Medical Audit in a systematic review and analysis of all the patients going through his service. This was probably the first organized Medical Audit in USA. He emphasized on the importance of good medical records and gave a major attention to the study of end results.

It was in 1928, that Dr. Thomas R Ponton presented a plan called “Professional Service Accounting” which was later issued by many institutions. The first step in this plan was to record the risk of each patient on admission. Dr. Ponton divided all the patients into three categories as far as treatment was concerned elective, emergency, and palliative. Under these categories he classified each patient as to risk good, fair or bad.

Dr. Ponton defined elective treatment as that which a patient undertakes voluntarily, upon the advice of the physician, so as to improve his health and comfort. And, when a patient enters as an emergency case, his life is in danger and immediate care must be rendered. In the palliative category, the patient is given relief or greater comfort for certain conditions causing pain or disability.

In view of these classifications and progresses, the medical staff, through an audit committee made a review of all professional work performed in the hospital and this constituted a thorough audit each month.

A most successful plan of Medical Audit along these lines with some modification has been carried on under the leadership of Dr. Frederick Hill of Waterville, Maine. Dr. Hill, the Medical Director of Thayer Hospital has manifested distinctive leadership in this work. The regular systematic and thorough review done by Hill had been very effective in keeping the professional war on a high quality level and had also been of educational value for all medical staff members for the hospital.

Dr. Malcolm T MacEachern was the Director of Hospital Standardization movement for the American College of Surgeon for 27 years. He took a great interest in the growth of Medical Audit through this movement and planned for a thorough evaluation of the professional work of each member of the medical staff and the hospital as a whole. He believed that Medical Audit is a cooperative project and required the interest of the administrators, the governing board and the medical staff. [5]

Definitions of Medical Audit :

Good clinicians have always organized some kind of systematic review of their daily work, recording and assessing the accuracy of their diagnosis and the outcome of their treatment. We have learnt to call this kind of activity audit. It will not be appropriate to define Medical Audit without discussing the concept on which its definition is based. However for a simple understanding of the issue, Medical Audit is defined as the evaluation of the high quality of medical care through the analysis of medical records in retrospect.

According to Webster Dictionary, the word "Audit" is defined as "an official examination and verification of accounts of dealing". [6]

To most of us, the word audit is familiar in relation to financial transactions. But, there is another aspect of accounting, dealings and transactions in the hospital, which is connected with the patient and is considered far more important that the financial transactions because it costs lives.

According to Dr. MacEachern "Financial efficiencies can eventually be met, but medical efficiencies may cost lives and loss of health which can never be retrieved". This aspect of medical care in hospital examination and verification of these dealings could be termed as Medical Audit. [5]

According to Dr. Anjan Prakash, "The Medical Audit is defined as a method of appraising the quality of care rendered". [6]

According to Dr. Mudaliar, Medical Audit is defined as "the review of the professional work in the hospital that could take place whenever, the medical staff meet to analyze the hospital clinical work". [7]

According to Myers and Slee, "Medical Audit is the evaluation by physician of the quality of care as revealed by the medical records". They said, "Simple review of medical records cannot be termed as medical audit. However, to be Medical Audit this review should be able to answer four questions: what did the patient have? What was done for him? Was the treatment optimum? If not, why not?" The answer to these four questions when collected, tabulated and analyzed may provide a means for evaluation against the criteria of standard set on the care of a patient or a group of patients. This may be termed as Medical Audit. [8]

In other words, medical audit may be said to be examination and verification of professional dealings by clinicians and their verification according to the standard or criteria on the basis of the data collected through professional accounting system in hospital i.e. medical records.

According to Alment Committee Report, "Medical Audit is the sharing by a group of peers, the information gained from personal experience and /or medical records, in order to assess the care provided to their patients, to improve their own learning, and to contribute to medical knowledge". [9]

According to F. Difford, "Medical Audit may be defined simply as looking at what we are doing with the aim of making improvements in patient care and use of resources". [10]

According to McKee, Laugo and Lesson, "Medical Audit as the systematic, critical analysis of the quality of medical care, including the procedures used for diagnosis and treatment, the use of resources, and the resulting outcome and quality of life for the patient". Audit is continuous cycle, involving observing practice, setting standards, comparing practice with standards, implementing change and observing the new practice. To be a meaningful audit the procedures must complete this cycle. [11]

Thus, medical audit is a systematic approach to peer review of medical care in order to identify opportunities for improvement and provide a mechanism for realizing them. Medical Audit and Clinical Audit are often used interchangeably, but clinical audit might be considered to cover all aspects of clinical care, e.g. nursing and the role of praramedical staff, whereas medical audit

relates to practices initiated directly by doctors. It complements and may partly overlap financial audit, utilization review, and management of resources, but is primarily clinical, not managerial; its focus is the process and results of medical care rather than the use of resources and it is the responsibility of doctors than managers.

Medical Audit is more systematic, quantified, and formal than traditional clinical ward rounds, meetings, and case presentations but shares with these the objectives of better patient care and education.

Principles of Medical Audit :

In an analysis to find ways of measuring the design and effectiveness of hospital audit, Charles D Shaw, Director of Medical Audit Programme, King's Fund Center, London has very effectively contributed by designing "Guidelines for Medical Audit: Seven Principles". These seven main measures serve as practical criteria. They are the definition of medical and managerial responsibilities; medical organization; scope of audit; essential characteristics; resources needed; record keeping and evaluation. This work of Dr Shaw offers criteria by which clinicians and hospital administrators may judge whether the service is being audited adequately.

The seven principles according to Dr. Shaw are:

1. **Health authorities and medical staff should define explicitly their respective responsibilities for the quality of patient care.**

   Health authorities and managers would not claim to be competent to make judgements on the technical quality of medical care. They must therefore entrust this function to medical staff and have an agreed level of feedback and an assurance that audit exists and it is effective in improving patient care. Medical staff should accept corporate responsibility for the quality of medical care both within their own speciality and within the hospital.

2. **Medical staff should organize themselves in order to fulfill responsibilities for audit and for taking action to improve clinical performance.**

   A regional health authority level it may be appropriate to have an advisory committee able to give advice, coordinate district activity and establish mechanisms for audit of regional specialities and district subspecialities. A designated consultant as a recognized clinical commitment with sessions should coordinate medical audit throughout the hospital or district. A steering group responsible to the medical staff would provide support. The purpose would be to develop a consistent and comprehensive pattern of audit.

3. **Each hospital and speciality should agree to a regular programme of audit in which doctors in all grades participate.**

Each programme of audit should define priorities for reviewing inpatients, day patients and outpatients every year. It should recognized that different specialities and case mix require different approaches; in most instances that systematic sampling is more practical than review of every case; and that well tried audit techniques are not available for all aspects of medical care.

Audit should include the use of diagnostic and therapeutic procedures, management of selected clinical conditions, and when possible, measures of outcome. When clinical responsibility is shared among specialities e.g. admissions from the accident unit, intensive care, and preoperative events joint audit meetings may be needed. These would include non-medical clinical staff, but all doctors should participate in the audit of their own work and that of their colleagues. Small specialities may need to collaborate on a regional or even supra regional basis in order to provide valid comparisons.

4. The process of audit should be relevant, objective, quantified, repeatable, and able to effect appropriate change in organization of the service and clinical practice.

The performance of audit and the specific subjects chosen should be relevant to the care of patients and to the training and education of doctors. Priorities might include conditions or treatments characterized by high volume, high risks, and high cost or in which there is particular concern or disagreement over clinical management. Individual cases should be selected either at random or systematically by previously agreed criteria.

The definition of explicit criteria or standards is an essential part of the process. Criteria should reconcile local practice with protocols, which have already been defined, evaluated, and published. They should be capable of being adapted in response to audit and the development of medical knowledge.

General patterns of practice rather than individual or anecdotal cases should be examined so that conclusions can be reached. Current practice and results should, if possible, be quantified so that they can be compared with other results over time.

Recommendations for action by management change in clinical policy or postgraduate education should be stated explicitly and responsibility for their implementation identified.

5. Clinicians should be provided with the resources for medical audit.

Audit should be recognized as a legitimate part of the work of clinicians. At least half a session a week should be assigned to educational activities, including medical audit; this will vary among specialities and according to the clerical and technical support available. In addition to regular audit meetings, documentation, and following up conclusions, as well as for helping other medical staff in developing audit. Allocation of sectional time should be separate from commitments to planning, management, and budgetary control.

Accurate, up to date patient based data should be available in each speciality. Clinicians should personally oversee checking the accuracy of clinical inputs to hospital data systems. Raw materials include diagnosis, operations and mortality listings as well as national data for comparisons.

6. The process and outcome of medical audit should be documented.

Data analysis and audit of individual patients and doctors must be confidential. Nevertheless, records should be kept of the data of audit meetings and attendance, issue evaluated, items for improvement identified, actions taken or planned and results of this action. Regular reports should be made to medical staff and the health authority at an agreed level of detail and frequency so that effective audit is confirmed.

7. Medical audit should be subject to evaluation.

Doctor's, managers and health authorities should have enough information to evaluate the following items, each of which requires "yes" or "no".

- Structure.

There is formal agreement among health authorities, management and consultant medical staff on responsibility for medical audit. Medical staff corporately accepts responsibility for the quality of medical care within the hospital. There is a named consultant or group or both to coordinate medical audit within the hospital. Every doctor is assigned to a formal speciality division of the medical staff. There are formally constituted

groups, including clinical consultants, with responsibility for drugs and therapeutic policy, infection control, postgraduate medical education, ethics and medical records. Time for audit is identified in individual consultant programmes. Timely, accurate local data are available to each speciality including diagnostic index, operations and procedure index, and morality listing. Clerical and technical support is allocated for medical audit.

- Process.

Each speciality meets formally and regularly to review clinical work. This review is attended by all members of the speciality, includes the work of each consultant firm and compares numerically patterns of practice. Recommendations are – recorded for references, distributed to relevant staff, and reviewed to assess progress. Medical staff receives regular audit reports from each speciality. Health authorities and management receive a regular summary of process and out come of audit from medical staff.

- Outcome.

Recommendations lead to documented changes in: Availability of services, organization of services, written clinical policy, and clinical practice, utilization of resources.

Improvement is measured in key issues such as complication rates, avoidable mortality etc.

Though these seven guidelines are generally consistent with the other proposals made elsewhere regarding the procedures of evaluation of medical care but they do offer some alternative approaches. The term medical audit is here to stay. Alternatives like clinical review make less clear that the activity is a systematic examination by doctors of what they do and what results they obtain.

A study revealed that the role of audit could broadly be divided into two aspects – Education and Finance. Audit can be a form of education and formal sessions are increasingly being recognized as an essential component of training in clinical skills. In a climate of resources constrains, the ability of audit to improve cost effectiveness is attractive. [12]

Another study on audit showed that it found departures from standards, and potential of risk and failure. New standards may be needed regarding Anaesthesia record sheet, induction, accountability, when to seek help and care of sick patients. Supervision systems in over 40% of hospitals need review to ensure that they provide a named consultant and immediate direct support for effective list. [13]

Yet another study conducted in Canada on critical care activities revealed that the importance of having established ICU policies and procedures to serve as standards of care in each unit should be emphasized. Policies and procedures should be evaluated in collaborative manner, by nursing and medical practitioners. One of the greatest assets of audit is fostering into action between medical, nursing and paramedical staff, particularly in response to reports. [14]

Another study revealed that unidisciplinary or multidisciplinary medical care ventures are benefited in terms of improved communication among the colleagues and other professional groups, improved patient care, increased professional satisfaction and better administration. [15]

MATERIALS AND METHODS

The materials and methods used for assessing the significance of existing medical care system and its leverage on ultimate objectives of Anaesthesia department in KLES Prabhakar Kore Hospital and MRC Belgaum included the following –

RESEARCH SETTING :

The study was conducted in KLES Prabhakar Kore Hospital and Medical Research Center, Belgaum, a 1820 bedded super speciality teaching hospital, established in the year 1996.

The hospital offers all the basic specialties such as General Medicine, General Surgery, Orthopaedics, E.N.T., Obstetrics and Gynaecology, Ophthalmology, Paediatrics etc. The hospital also offers super speciality services like Cardiology, Cardiovascular and Thoracic Surgery, Nephrology, Neuro-Surgery, Gastroenterology, Neonatology, Oncology, Joint replacement and Arthroscopy etc.

RESEARCH DESIGN :

A cross sectional descriptive approach was adopted in the study. It included collection of information and data directly from the subjects of the study through a questionnaire schedule as well as from the medical records. The approach attempts to describe and interpret what exists at present in the form of conditions, practices, process, trends, beliefs etc.

POPULATION :

The population for this study included all the staff of Anaesthesia department and the medical records of patients operated between October 2007 – December 2007 in KLES Prabhakar Kore Hospital and MRC, Belgaum.

SAMPLE SIZE :

Entire population of staff working in the Anaesthesia department was included therefore there was no sampling technique used for collection of data on the physical and biological system.

Where as simple random sampling technique was used to select medical records of patients undergoing the cardiac surgery, for collecting data on mechanical system.

CRITERIA FOR SELECTION OF SAMPLE :

a) Inclusion Criteria :

- The study participants who gave their consent for participating in the study.
- Staff of the Anaesthesia department working in KLES Prabhakar Kore Hospital and MRC Belgaum.
- Medical records of patient undergoing cardiac surgery during the period from October 2007 to December 2007.

b) Exclusion Criteria :

- Study participants who did not give their consent for participation in the study.
- Staff's other than those who belong to the Anaesthesia department in KLES Prabhakar Kore Hospital & Medical Research Center, Belgaum.
- Medical records of patients under going cardiac surgery other than the period from October 2007 to December 2007
- Medical records of patients undergoing surgeries other than cardiac surgeries.

CONSTRUCTION OF TOOL :

The tool was constructed using review of literature from books, journals and published research studies.

DESCRIPTION OF TOOL :

The structured questionnaire had three sections as follows:

Section 1– Physical System: It had 24 items related to the infrastructure i.e. area, location, internal design, ventilation, equipments, etc that existed in the Anaesthesia department.

Section 2 – Mechanical System: It had 29 items for assessing the technology and procedures that existed in the Anaesthesia department.

Section 3 – Biological System: It had 19 items for assessing human resources and related aspects that existed in the Anaesthesia department.

DATA COLLECTION PROCESS –

Step 1 : A formal permission was obtained from Principal, Jawaharlal Nehru Medical College, Belgaum and Medical Director, KLES Prabhakar Kore Hospital & M.R.C., Belgaum.

Step 2 : Investigator introduced himself to the study Participants.

Step 3 : Consent was taken from the study participants regarding their participation in the study.

Step 4 : The structured questionnaire was administered to the study participants.

Step 5 : A formal permission was taken from the Administrator, Clinical services for accessing the medical records.

Step 6 : The medical records of patients undergoing cardiac surgery during the study period were selected through a simple random sampling technique.

Step 7 : The secondary data on the mechanical system was collected from the medical records of the patients.

DATA ANALYSIS TECHNIQUE:

The data analysis was carried out using the frequency, percentage and ratio analysis technique.

OPERATIONAL DEFINITIONS :

- ***Systems Audit*** – Refers to verification of adequacy of existing procedural aspects commensurate with the size of activity.
- ***Physical System*** – Refers to availability of infrastructure in terms of land, building, furniture's, equipments etc.
- ***Mechanical System*** – Refers to style or procedure adopted in carrying out Anaesthesia activity.
- ***Biological System*** – Refers to availability of qualified and skilled manpower in Anaesthesia department.
- ***Anaesthesia*** – Refers to a controllable and reversible procedure, which provides drug-induced hypnosis, analgesia, depression of reflexes and controlled muscular relaxation.
- ***Anaesthetist*** – Refers to a person specialized and engaged in the activity of anaesthetizing the patient for the surgical activities.

RESULTS

For the purpose of study the entire Anaesthesia department is divided into three major systems namely:

a. Physical System

b. Mechanical System

c. Biological System

a. PHYSICAL SYSTEM:

This system is aimed at ascertaining the efficiency in terms of infrastructural front such as –

- Land, building and location
- Area occupied
- Distance from Operation Theatre
- Access to Operation Theatres
- Computerization
- Adequacy of internal design
- Furniture and fixtures
- Ventilation
- Internal communication system
- Departmental library facility
- Departmental laboratory
- Department well equipped

Table no.1. Assessing the existing Physical system in the Anaesthesiology Department

S.No	Items	Findings	Percentage f (%)
1.	Location	Centrally located	42 (100%)
2.	Area occupied	Adequate	10 (24%)
		Inadequate	32 (76%)
3.	Distance from OT	Nearer	42 (100%)
4.	Access to OT	Direct	42 (100%)
5.	Computerization	Yes	42 (100%)
6.	Adequacy of Internal Design	Satisfactory	31 (74%)
		Good	7 (17%)
		V. good	5 (12%)
7.	Furniture and fixtures	Adequate	34 (81%)
		Inadequate	8 (19%)
8.	Ventilation	Adequate	36 (86%)
		Inadequate	6 (14%)
9.	Internal communication system	Adequate	42 (100%)
10.	Departmental Library	Yes	42 (100%)
11.	Departmental Lab	No	42 (100%)
12.	Department well equipped	Yes	7 (17%)
		No	35 (83%)

b. MECHANICAL SYSTEM :

This system aims at ascertaining the technological efficiency and proficiency in carrying out the pre-Anaesthetic and Anaesthetic activities, and recording the different data such as –

- Type of patient classified as per ASA classification
- Type of Anaesthetist
- Anaesthetist opted by
- Anaesthetist on panel doctor of KLE
- History of Patient
- Routine checkup of patient
- Consent from the patient as per ASA classification
- Pre-medication of the patient
- When was the patient put on Anaesthesia
- Circuit used for ventilation
- Types of Anaesthetic drugs used
- Resuscitation equipments used
- Monitoring equipments used
- Any postoperative complications or iatrogenic diseases caused
- Maintenance of Anaesthesia sheet

Table no.2. Assessing the existing Mechanical system in the Anaesthesiology Department

S.No	Items	Findings	Percentage f (%)
1.	Type of patient	Recorded	6 (24%)
		Non recorded	19 (76%)
2.	Type of Anaesthetist	Recorded	0 (0%)
		Non recorded	25 (100%)
3.	Anaesthetist opted by	Recorded	0 (0%)
		Non recorded	25 (100%)
4.	Anaesthetist is on panel doctor of KLE	Recorded	0 (0%)
		Non recorded	25 (100%)
5.	History of the patient	Recorded	25 (100%)
		Non recorded	0 (0%)
6.	Routine checkup	Recorded	25 (100%)
		Non recorded	0 (0%)
7.	Consent as per ASA classification	Recorded	18 (72%)
		Non recorded	7 (28%)
8.	Pre-medication carried out	Yes	10 (40%)
		No	3 (12%)
		Not recorded	12 (48%)
9.	When was the patient put on Anaesthesia	Recorded	0 (0%)
		Non recorded	25 (100%)

..... Cont'd

Cont'd .....

S.No	Items	Findings	Percentage f (%)
10.	Circuit used for ventilation	Recorded	0 (0%)
		Non recorded	25 (100%)
11.	Type of Anaesthetic drugs used	Recorded	25 (100%)
		Non recorded	0 (0%)
12.	Resuscitation equipments used	Recorded	0 (0%)
		Non recorded	25 (100%)
13.	Monitoring equipments used	Recorded	0 (0%)
		Non recorded	25 (100%)
14.	Any postoperative complications or iatrogenic diseases caused	Recorded	0 (0%)
		Non recorded	25 (100%)
15.	Anaesthesia sheet maintained	Yes	25 (100%)
		No	0 (0%)

c. BIOLOGICAL SYSTEM :

This system aims at ascertaining the quality and quantity of manpower, the respective job satisfaction among them, statutory benefits available to them and working conditions. It includes –

- Gender
- Age
- Designation
- Length of service
- Educational qualification
- Job satisfaction
- Working in which shifts
- Working in which OT
- Inclination towards particular shift
- Inclination towards particular OT
- Associates and staff cooperation
- Communication system
- Awareness about systems audit
- Scope for personal opinion
- Likes to suggest
- Statutory benefits
- Health hazards
- Humiliations suffered

Table no.3. Assessing the existing Biological system in Anaesthesiology Department

S.No	Items	Findings	Percentage f (%)
1.	Gender	Male	33 (79%)
		Female	9 (21%(
2.	Age	Less than 30 yrs	30 (71%)
		31-40 yrs	8 (19%)
		41 and above	4 (10%)
3.	Designation	Anaesthetist	12 (29%)
		PG Student	28 (66%)
		Support staff	2 (5%)
4.	Length of service	Less than 5 yrs	32 (76%)
		6-15 yrs	8 (19%)
		16 and above	2 (5%)
5.	Educational Qualification	Super specialized	4 (10%)
		Specialized	15 (36%)
		Non specialized	23 (54%)
6.	Job satisfaction	Satisfied	42 (100%)
		Non satisfied	0 (0%)
7.	Working in particular shift	Particular	13 (31%)
		Changing	29 (69%)

..... Cont'd

Cont'd .....

S.No	Items	Findings	Percentage f (%)
8.	Working in particular OT	Hi-tech OT	25 (60%)
		Trauma OT	7 (17%)
		Free OT	13 (31%)
		Labour OT	7 (17%)
9.	Inclination towards particular shift	Yes	8 (19%)
		No	34 (81%)
10.	Inclination towards particular OT	Hi-tech OT	32
		Trauma OT	3
		Free OT	8
		Labour OT	3
11.	Associate and staff cooperation	Yes	42 (100%)
		No	0 (0%)
12.	Communication in the department	Happy	41 (98%)
		Unhappy	1 (2%)
13.	Awareness about systems audit	Yes	33 (79%)
		No	9 (21%)
		No	2 (5%)
14.	Scope for personal opinion	Yes	40 (95%)
		No	2 (5%)
15.	Likes to suggest	Yes	18 (43%)
		No	24 (57%)

..... Cont'd

Cont'd .....

S.No	Items	Findings	Percentage f (%)
16.	Statutory benefits	Yes	11 (26%)
		No	28 (67%)
		Neutral	3 (7%)
17.	Health hazards	Yes	3 (7%)
		No	39 (93%)
18.	Humiliation suffered	Yes	1 (2%)
		No	11 (26%)
		Neutral	30 (72%)

DISCUSSION

For the purpose of this study the entire Anaesthesiology department was divided into three major systems namely :

a. Physical System

b. Mechanical System

c. Biological System

a. PHYSICAL SYSTEM:

- **Location of the department with respect to OT**

From the data so collected it is very clear that the location of the Anaesthesiology department with respect to operation theatres and Hi-tech surgeries in particular is centrally located.

- **Area occupied by the department**

From the data it appears that majority of the people are of the opinion that the area occupied by the department is inadequate i.e. to say about 32(76%) staff are of the opinion that the area is inadequate and about 10(24%) staff feel the area occupied is adequate.

The inadequacy of the area occupied can further be justified by the ratio analysis stated below –

i. Floor area with respect to hospital area

$$\frac{\text{Area occupied by the department}}{\text{Total area of the hospital}} = \frac{1000 \text{ sq ft}}{125000 \text{ sq ft}} = 0.008 \text{ or } 0.8\%$$

From the above statistical data it is quite clear that the total area occupied by the department is just 0.8% of the total hospital area.

ii. Per capita space

$$\frac{\text{Area occupied by the department}}{\text{Total no of staff working in the dept.}} = \frac{1000 \text{ sq ft}}{42 \text{ nos}} = 23.8 \text{ sq ft/head}$$

The above ratio shows that the per capita space available in the department is 23.8 sq ft, which means when the entire staff is in the department, the department is likely to be overcrowded due to inadequate space.

- **Access to the Operation Theatre**

The results of the study reveal clearly that the department has direct access to the operation theatres and vice-versa. This can very well be justified from the response of the subjects because all the 42(100%) subjects have responded in favour.

- **Computerization**

From the data it is clear that the department is computerized in all respects and the departmental personnel 42(100%) appeared to be happy about adequacy of computerization.

- **Adequacy of internal design**

The findings show that 31(74%) subjects were happy about the internal design of the department but on other hand about 11(26%) subjects are of the opinion that there is a need for improvisation in the internal design commensurate with the size of the activities.

- **Furniture and fixtures**

It is apparent that 34(81%) subjects are of the opinion that the furniture and fixtures are adequate in number and about 8(19%) subjects are of the opinion that the department needs further procurement of furniture's.

- **Ventilation of the department**

The findings reveal that the department has adequate ventilation and the same is justified because 36(86%) of the subjects responded in favour and the remaining subjects i.e. 6(14%) voted against.

- **Internal communication system**

The results of the study show that the department is provided with intercom facilities and the adequacy is very good, and the same has been responded favourably by all the 42(100%) subjects.

- **Departmental Library**

Though the department is provided with internal library which has been responded favourably by all the subjects, the number of books so available amount's to only about 45, which means per capita availability of book is –

$$\frac{\text{Number of books}}{\text{Total no of staff}} = \frac{45 \text{ nos}}{42 \text{ nos}} = 1.07 \text{ books/head}$$

- **Departmental Laboratory**

It is very clear from the findings that the department is not provided with an internal departmental laboratory for any critical analysis or investigation to be carried out either by the staff or by the postgraduate students.

- **Department well equipped**

The findings show that the department is not good enough equipped as only about 7(17%) subjects responded in favour as against 35(83%) subjects.

b. MECHANICAL SYSTEM:

- **Type of patient**

The results revealed that only in about 6(24%) cases, the classification of the patient as per ASA classification was recorded but in remaining 19(76%) cases the classification was not recorded.

- **Type of anaesthetist**

It was very hard to notice from the results that in none of the 25 cases the type of anaesthetist was recorded on the anaesthesia sheet.

- **Anaesthetist opted by**

The results further made it clear that the system of opting the anaesthetist by the patient was not in practice, as it was evident from all the 25(100%) cases.

- **Anaesthetist is on panel doctor of KLE**

The findings revealed that it was not very clear from the documents i.e. anaesthesia sheet and pre-anaesthesia evaluation sheet, whether the anaesthetist working on a particular case was an on panel of KLE or otherwise.

- **History of the patient**

The results showed that the department personnel were religiously following the system of collecting the history of the patient and recording it on the pre-anaesthesia evaluation sheet, which was observed in all the 25 (100%) cases.

- **Routine checkup**

It was quite evident from the results that incase of all the 25(100%) cases the patient had undergone routine checkup and the data related to the checkup was recorded on pre-anaesthesia evaluation sheet.

- **Consent as per ASA classification**

From the results it was noticed that only in about 7(28%) cases, the consent as per ASA classification was taken but in remaining 18(72%) cases it was not recorded.

- **Pre-medication**

The results revealed that in 10(40%) cases the pre-medication was carried out, but in 3(12%) cases it was not very clear from the records as to what extent the pre-medication was done and in remaining 12(48%) cases no data was available.

- **When was the patient put on anaesthesia**

The findings disclosed that in all the 25 (100%) cases there were no records maintained neither on anaesthesia sheet or otherwise, as to when the patient was put on anaesthesia, which shall technically be after the arrival of the surgeon.

- **Circuit used for ventilation**

From the results it was very clear that the department didn't follow the system of recording the type of circuit used for the ventilation of the patient at the time of surgery, this was noticed in all the 25 (100%) cases.

- **Type of anesthetic drugs used**

The findings revealed that the data related to anaesthetic drugs used, was clearly available on anaesthesia sheet in all the 25(100%) cases.

- **Resuscitation equipments used**

It appears from the results that the department didn't follow or posses a system recording the data about the resuscitation equipment used during the course of surgery on the patient. This was evident in all the 25 (100%) cases.

- **Monitoring equipments used**

The results disclosed that there was no record being maintained at any point of time during the course of surgery regarding any other monitoring equipments being used. This was evident from all the 25(100%) cases.

- **Any postoperative complications or iatrogenic diseases caused**

It was noticed from the findings that there was no system of recording any specific post operative complications developed or iatrogenic diseases caused on anaesthesia front, neither in anesthesia sheet nor any other relevant document. This was observed in all the 25(100%) cases.

- **Anaesthesia sheet**

The findings revealed that the anaesthesia sheet was adequately filled in all the 25(100%) cases, though the sheet itself calls for some modifications and up gradation to record more relevant data. But on the other hand it was also noticed that none of the case papers i.e. 25(100%) cases, the anaesthesia sheets were duly signed by the concerned authorities.

c) BIOLOGICAL SYSTEM:

- **Gender**

It was evident from the results that the Anaesthesiology department was constituted of 33(79%) male personnel and only 9 (21%) female staff.

- **Age**

The results further showed that 30(71%) of the total staff were of 'less than 30 years' age, 8(19%) were of '31-40 years' age and only 4(10%) were of 'more than 41 years' age.

- **Designation**

It was learnt from the results that there were about 12(29%) staff designated as 'Anaesthetist' on the muster, around 28(66%) were the postgraduates and diploma in anaesthesia students working in the department, and only about 2 (5%) staff were designated as 'supporting staff'.

- **Length of service**

The results of the study revealed that 32(76%) of the total staff possessed a job experience of 'less than 5 years', about 8(19%) of the staff possessed a job experience between '6-15 years' and only about 2(5%) of the total staff possessed 'more than 16 years' of experience.

From the above findings it was quite clear that the department possess moderately efficient and experienced staff with minimum labour turnover.

- **Educational qualification**

The results of the study further disclosed that 4(10%) of the total staff were 'super specialized anaesthetists', 15(36%) of the staff was 'specialized anaesthetists' and about 23(54%) of the staff was 'non-specialized' staff.

- **Job satisfaction**

The findings revealed that the entire staff of the Anaesthesiology department was fully satisfied, which was clear from all the 42(100%) subjects that voted in favour.

- **Working in shift**

The results show that 9(25%) of the subjects worked in a particular shift and the remaining 33(75%) subjects worked in changing shift.

- **Working in OT**

From the findings it was noticed that 25(60%) of the subjects worked in 'Hi-tech OT', 7(17%) worked in 'Trauma OT', 13(31%) worked in 'Free OT' and 7(17%) worked in 'Labour OT'.

- **Inclination towards a particular shift**

The findings further revealed that there were 7(17%) subjects fond of working in a particular shift that they like and 35(83%) subjects preferred to work in any shift that was allotted to them.

- **Inclination towards a particular OT**

The results of the study showed that 32(76%) of the subjects were fond of working in 'Hi-tech OT', 3(7%) subjects preferred to work in 'Trauma OT', 8(19%) preferred 'Free OT', and about 3(7%) subjects preferred to work in 'labour OT'.

- **Associate and staff cooperation**

The results conveyed that there was a proper understanding and cooperation among the staff, which was evident from the positive response given by all the 42(100%) subjects.

- **Communication in the department**

It was learnt from the results that there was proper upward and downward communication within the department, which was quite evident from the positive response given by all the 42(100%) subjects.

- **Awareness about systems audit**

The results disclosed that about 33(79%) of the subjects are quite aware about 'systems audit' and the rest 9(21%) subjects were unaware about the same.

- **Scope for personal opinion**

It was clear from the findings that there was enough scope for personal opinions in the department as about 40(95%) of the staff consents in favour where as only 2(5%) subject responded against it.

- **Likes to suggest**

It was seen from the findings that about 16(38%) of the total subjects liked to extend suggestions to draw the attention of the management for further improvisation. On the other hand about 24(57%) of the subjects showed no interest towards any suggestions.

- **Statutory benefits**

It was further observed from the results that only about 11(26%) of the staff were enjoying all the statutory benefits as against 31(74%) staff were deprived of these benefits. This could be attributed to the reason that the department is a part of a teaching hospital.

- **Health hazards**

From the findings it was clear that only 3(7%) of the subjects suffered from major health hazards on duty in the past, where as the balance 39(93%) subjects did not.

- **Humiliation**

It was evident from the results that only 1(2%) of the total subjects felt humiliated but on the other hand about 11(26%) subjects did not feel so and the balance didn't respond to the question.

SUMMARY

The present study was undertaken to conduct the systems medical audit in Anaesthesia department in KLES Prabhakar Kore Hospital and MRC Belgaum.

Entire population of staff working in the Anaesthesia department was included therefore there was no sampling technique used for collection of data on the physical and biological system.

Where as simple random sampling technique was used to select medical records of patients undergoing the cardiac surgery during the period from October 2007 to December 2007. Secondary data on the mechanical system was collected from the selected medical records.

The study was aimed at accomplishing the following objective:-

- To assess the significance of existing medical care system with regard to infrastructure, technology, human resources and other related activities and its leverage on ultimate objectives of Anaesthesia department.

Physical System:

The Anaesthesiology department is primarily a function of physical system because without a proper infrastructure in terms of land, building, furniture & fixtures, equipments etc it is not possible to enable the personnel in achieving the goal more effectively.

In this study it was observed that the department in terms of area occupied with respect to the size of hospital and number of staff working within the department was inadequate i.e. the department possessed only 0.8% of the total hospital area and 23 sq ft per capita space availability.

Also the department requires to be well equipped in all the respects to meet out the upcoming competition in the market

Mechanical System

The primary aim of any department in a hospital is to ascertain how meticulous is the department in treating its patients to their satisfaction, by minimizing and avoiding unwanted treatments, and keeping the patient away from any iatrogenic diseases. Therefore, to be efficient and effective in delivering the services, the Anaesthesiology department needs to have a very scientific mechanical approach.

In this study it was noticed that though the necessary mechanism in treating the patient was followed there were very little sets of information recorded, as a result it becomes very difficult for any third person to assess the precision of work or mechanism that has been achieved in the activity.

Biological System

The primary aim of biological system is to ascertain the quality and quantity of the manpower that the department possess.

In this study it was noticed that the department possessed a moderate quality and efficiency of staff but this could further be enhanced by meeting out the necessary motives of the respective personnel and educating them on different fronts.

CONCLUSION

The study reveals that the Anaesthesiology department needs to be improvised in different fashions stated below.

Physical system

The department will have to be provided with adequate space, adequate library and study materials, and a properly equipped laboratory for the staff to carryout any investigations either in the academic interest of the staff or otherwise.

Mechanical System

The department needs to be educated about the importance of recording the events and preserving them properly, and also by upgrading the pre-anaesthesia evaluation sheet otherwise it becomes difficult for anyone to ascertain the quality of services provided by the department.

Biological System

As the department possess a moderate quality and quantity of anaesthesia staff, there is hardly anything to comment negative but with a positive note the biological system can be concluded.

RECOMMENDATIONS

On the basis of the systems medical audit conducted certain recommendations are due to be recommended as below –

Physical system :

- Adequate per capita space
- Well equipped internal laboratory
- Adequate per capita book
- Adequate computerization

Mechanical System :

- Upgrade the anaesthesia sheet to record the various data's such as type of anaesthetist, anaesthetist opted by, anesthetist on panel doctor, equipments used during anaesthesia, circuit used for ventilation, when was the patient put on anaesthesia, any resuscitation equipments used, post operative complications and iatrogenic diseases caused.
- Ensure that all the anaesthesia sheet are duly signed by the concerned authorities.

Biological systems :

- No recommendations

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STRUCTURED QUESTIONNAIRE ON SYSTEMS MEDICAL AUDIT IN ANAESTHESIA DEPARTMENT

Code No ☐

SECTION – 1: PHYSICAL SYSTEM

Name of the person: _____

1.	Gender :	Male ☐ Female	☐
2.	Age :	a) Below 30 years	☐
		b) 31-40 years	☐
		c) 41 and above	☐
3.	Designation :	a) Anesthetist	☐
		b) PG student	☐
		c) Support staff	☐
4.	Length of service :	a) less than 5 years	☐
		b) 6-15 years	☐
		c) 15 and above	☐
5.	Educational qualification :	a) Super specialized	☐
		b) Specialized	☐
		c) General	☐
6.	Location of dept. with respect to OT :	a) Centrally located	☐
		b) Isolated	☐
7.	Area occupied by the department :	a) Adequate	☐

		b) Inadequate	☐
8.	Distance of department from OT :	a) Nearer	☐
		b) Away	☐
9.	Access to the OT :	a) Direct	☐
		b) Indirect	☐
10.	Computerization :	a) Yes	☐
		b) No	☐
11.	Adequacy of internal design :	a) Adequate	☐
		b) Inadequate	☐
12.	Furniture and fixtures :	a) Adequate	☐
		b) Inadequate	☐
13.	Ventilation to the department :	a) Adequate	☐
		b) Inadequate	☐
14.	Internal communication device :	a) Adequate	☐
		b) Inadequate	☐
15.	Internal library :	a) Adequate	☐
		b) Inadequate	☐
16.	Departmental lab :	a) Yes	☐
		b) No	☐
17.	Is the department well equipped? :	a) Yes	☐
		b) No	☐

18. Are all the statutory documents maintained?

a) Yes ☐

b) No ☐

19. No of Senior anesthetists : a) Adequate ☐

b) Inadequate ☐

20. No of junior anesthetists : a) Adequate ☐

b) Inadequate ☐

21. No of postgraduate students : a) Adequate ☐

b) Inadequate ☐

22. No of other supporting staff : a) Adequate ☐

b) Inadequate ☐

23. Is the ratio of surgeon to Anesthetist adequate?

a) Adequate ☐

b) Inadequate ☐

24. Is the ration of Anesthetist equipments to OT adequate?

a) Adequate ☐

b) Inadequate ☐

SECTION – 2: MECHANICAL SYSTEM

Name of the patient : _____

1.	Gender :	Male ☐ Female	☐
2.	Age :	a) Below 30 years	☐
		b) 31-40 years	☐
		c) 41 and above	☐
3.	Type of patient :	a) Normal	☐
		b) Abnormal	☐
4.	Type of surgery :	a) Predetermined	☐
		b) Emergency	☐
		c) Trauma	☐

Name of surgeon : _____

5.	Type of surgeon :	a) Super specialized	☐
		b) Specialized	☐
		c) General	☐

Name of the Anesthetist : _____

6.	Type of Anesthetist :	a) Super specialized	☐
		b) Specialized	☐
		c) General	☐
7.	Anesthetist opted by :	a) Doctor	☐
		b) Patient	☐

8. Anesthetist is a panel Doctor of KLE : a) Yes ☐

b) No ☐

9. Type of OT : a) Hi-tech OT ☐

b) Trauma OT ☐

c) Free OT ☐

d) Labour OT ☐

10. Is history of patient taken : a) Yes ☐

b) No ☐

11. Is routine check up done? : a) Yes ☐

b) No ☐

12. Is the consent of the patient obtained as per ASA classification? :

a) Yes ☐

b) No ☐

13. Is the Pre-medication carried out before surgery? :

a) Yes ☐

b) No ☐

14. Equipments used during Anesthesia administration?

a) ☐

b) ☐

c) ☐

d) ☐

15. Did any assistant assist the Anesthetist? :

a) Yes ☐

b) No ☐

16. When was the patient put on anesthesia, before or after the arrival of surgeon? :
    a) Before ☐
    b) After ☐

17. Circuit used for ventilation of the patient? :
    a) MAGILLS ☐
    b) BAINS ☐
    c) CLOSE ☐
    d) AYRES T Ps ☐

18. Type of anesthetic drug used for the patient? :
    a) Anesthetic drugs ☐
        i. Inhalation anesthetics ☐
        ii. Local anesthetics ☐
    b) Non anesthetic drugs ☐

19. Any other non routine drugs used? :
    a) Yes ☐
    b) No ☐

20. Any resuscitation equipment used? :
    a) Yes ☐
    b) No ☐

21. Any other additional equipment used? :
    a) Yes ☐
    b) No ☐

22. Any other monitoring equipment used?
    a) Yes ☐
    b) No ☐

23. Duration of the surgery? :
    a) Normal ☐
    b) Abnormal ☐

24. No of time anesthesia given?
    a) Once ☐
    b) More than once ☐

25. Was a case of disseminated intra-vascular coagulation observed ?

a) Yes ☐

b) No ☐

26. Is the anesthesia sheet properly maintained? :

a) Yes ☐

b) No ☐

27. Outcome of the surgery? : a) Yes ☐

b) No ☐

If 'No" the reasons : _____

_____

28. Did the patient have any side effects?

a) Yes ☐

b) No ☐

If 'Yes' the reasons : _____

_____

29. Is any postoperative complication observed on anesthesia ground?

a) Yes ☐

b) No ☐

SECTION – 3: BIOLOGICAL SYSTEM

Name of the person: _____

1.	Gender :	Male ☐ Female	☐
2.	Age :	a) Below 30 years	☐
		b) 31-40 years	☐
		c) 41 and above	☐
3.	Designation :	a) Anesthetist	☐
		b) PG student	☐
		c) Support staff	☐
4.	Length of service :	a) less than 5 years	☐
		b) 6-15 years	☐
		c) 16 and above	☐
5.	Educational qualification :	a) Super specialized	☐
		b) Specialized	☐
		c) Non Specialized	☐
6.	Job satisfaction :	a) Satisfied	☐
		b) Not satisfied	☐
7.	Working in which shift :	a) Particular shift	☐
		b) Changing shift	☐
8.	Working in which :	a) Hi-tech OT	☐

b) Trauma OT ☐

c) Free OT ☐

d) Labour OT ☐

9. Any particular shift fond off : a) Yes ☐

b) No ☐

10. Any particular OT fond off : a) Hi-tech OT ☐

b) Trauma OT ☐

c) Free OT ☐

d) Labour OT ☐

11. Is the associate staff co-operative : a) Yes ☐

b) No ☐

12. Happy about upward and downward communication :

a) Yes ☐

b) No ☐

13. Awareness about system and systems audit:

a) Yes ☐

b) No ☐

14. Scope for personal opinion : a) Yes ☐

b) No ☐

15. Likes to suggest : a) Yes ☐

b) No ☐

16. Are all the statutory benefits available? :a) Yes ☐

b) No ☐

17. Did he meet with any major health hazard on duty in the past? :

a) Yes ☐

b) No ☐

18. Did he have any health problems? : a) Yes ☐

b) No ☐

19. Does he get humiliated time and again either by the superiors or by the colleagues? : a) Yes ☐

b) No ☐

PICTURES OF EQUIPMENTS USED IN ANAESTHESIOLOGY DEPARTMENT

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

(11)

(12)