Summer Training at
Columbia Asia Hospitals Private Limited,
Gurgaon

Study on Quality Control Protocols in the Department of Radiology

By
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Under the guidance of
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MBA Hospital and Health Management
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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. Vivek Kumar Singh** student of **MBA Hospital and Health Management** from the IIHMR University; Jaipur has undergone summer training at **Columbia Asia Hospital, Palam vihar , Gurgaon** from 1st April to 31st May, 2016.

The candidate has successfully carried out the study designated to him during summer training and his approach to the study has been sincere, scientific & analytical.

The internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.

Col. (Dr.) Ashok Kaushik
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COLUMBIA ASIA

24th May 2016

To Whomsoever It May Concern

This is to bring to your kind notice that Dr. Vivek Kumar Singh has done his training with us in Operations Department from 1st April 2016 to 31st May 2016. During his tenure with us we found him to be diligent and hardworking.

We wish all the best to him in future endeavors.

Yours Sincerely,

For Columbia Asia Hospital Palam Vihar, Gurgaon

COLUMBIA ASIA HOSPITAL Gurgaon Haryana

Authorized Signature

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CIN: U85110KA2003PTC033055

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On the very outset of this report, I would like to extend my sincere and heartfelt obligation towards all the personages who have helped me in this endeavour. Without their active guidance, help, cooperation and encouragement, I would not have made headway in the project.

I am ineffably indebted to Ms. Rashmi Hingorani, Operations Head, Columbia Asia Hospitals, Gurgaon for conscientious guidance and encouragement to accomplish this assignment.

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I extend my gratitude to my mentor Dr. Nutan.P. Jain and IIHMR University, Jaipur for giving me this opportunity.

I also acknowledge with a deep sense of reverence, my gratitude towards my parents and member of my family, who has always supported me morally as well as economically.

At last but not least gratitude goes to all my colleagues who directly or indirectly helped me to complete this project report.

Sincerely,

Vivek Kumar Singh

Place: Jaipur

Date:21/06/2016

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ACRONYMS

IP - In patients

OP- Out Patients

OTC- Over The Counter

US – Ultra Sound

RDT-Radio Diagnostic Technology

CT-Computed Tomography

CS-Charge Sheet

OR-Operating Room

TLD- Thermo Luminescent Dosimeters

BMD- Bone Mineral Dosimeter

AERB-Atomic Energy Regulatiory Board

NABH-National Accreditation Board for Hospitals and Healthcare Providers

NABL-National Accreditation Board for Laboratories

Ops- Operations

ER- Emergency Room

QA – Quality Assurance

KRA – Key Result Area

INTRODUCTION

The **healthcare industry** (also called the **medical industry** or health economy) is an aggregation and integration of sectors within the economic system that provides goods and services to treat patients with curative, preventive, rehabilitative, and palliative care. It includes the generation and commercialization of goods and services lending themselves to maintaining and re-establishing health. The modern healthcare industry is divided into many sectors and depends on interdisciplinary teams of trained professionals and paraprofessionals to meet health needs of individuals and populations.

The healthcare industry is one of the world's largest and fastest-growing industries. Consuming over 10 percent of gross domestic product (GDP) of most developed nations, health care can form an enormous part of a country's economy.

For purpose of finance and management, the healthcare industry is typically divided into several areas. As a basic framework for defining the sector, the United Nations International Standard Industrial Classification (ISIC) categorizes the healthcare industry as generally consisting of:

1. hospital activities;
2. medical and dental practice activities;
3. "other human health activities".

This third class involves activities of, or under the supervision of, nurses, midwives, physiotherapists, scientific or diagnostic laboratories, pathology clinics, residential health facilities, or other allied health professions, e.g. in the field of optometry, hydrotherapy, medical massage, yoga therapy, music therapy, occupational therapy, speech therapy, chiropody, homeopathy, chiropractics, acupuncture, etc.

The Global Industry Classification Standard and the Industry Classification Benchmark further distinguish the industry as two main groups:

1. healthcare equipment and services; and
2. pharmaceuticals, biotechnology and related life sciences.

The healthcare equipment and services group consists of companies and entities that provide medical equipment, medical supplies, and healthcare services, such as hospitals, home healthcare providers, and nursing homes. The latter listed industry group includes companies that produce biotechnology, pharmaceuticals, and miscellaneous scientific services.

Other approaches to defining the scope of the healthcare industry tend to adopt a broader definition, also including other key actions related to health, such as education and training of health professionals, regulation and management of health services delivery, provision of traditional and complementary medicines, and administration of health insurance.

A healthcare provider is an institution (such as a hospital or clinic) or person (such as a physician, nurse, allied health professional or community health worker) that provides preventive, curative, promotional, rehabilitative or palliative care services in a systematic way to individuals, families or communities.

The World Health Organization estimates there are 9.2 million physicians, 19.4 million nurses and midwives, 1.9 million dentists and other dentistry personnel, 2.6 million pharmacists and other pharmaceutical personnel, and over 1.3 million community health workers worldwide, making the health care industry one of the largest segments of the workforce.

The medical industry is also supported by many professions that do not directly provide health care itself, but are part of the management and support of the health care system. The incomes of managers and administrators, underwriters and medical malpractice attorneys, marketers, investors and shareholders of for-profit services, all are attributable to health care costs.

The delivery of healthcare services—from primary care to secondary and tertiary levels of care—is the most visible part of any healthcare system, both to users and the general public. There are many ways of providing healthcare in the modern world. The place of delivery may be in the home, the community, the workplace, or in health facilities. The most common way is face-to-face delivery, where care provider and patient see each other

'in the flesh'. This is what occurs in general medicine in most countries. However, with modern telecommunications technology, in absentia health care is becoming more common.

This could be when practitioner and patient communicate over the phone, video conferencing, the internet, email, text messages, or any other form of non-face-to-face communication. Improving access, coverage and quality of health services depends on the ways services are organized and managed, and on the incentives influencing providers and users. In market-based health care systems, for example such as that in the United States, such services are usually paid for by the patient or through the patient's health insurance company. Other mechanisms include government-financed systems (such as the National Health Service in the United Kingdom). In many poor countries, development aid, as well as funding through charities or volunteers, help support the delivery and financing of health care services among large segments of the population.

The structure of healthcare charges can also vary dramatically among countries. For instance, Chinese hospital charges tend toward 50% for drugs, another major percentage for equipment, and a small percentage for healthcare professional fees. China has implemented a long-term transformation of its healthcare industry, beginning in the 1980s. Over the first twenty-five years of this transformation, government contributions to healthcare expenditures have dropped from 36% to 15%, with the burden of managing this decrease falling largely on patients. Also over this period, a small proportion of state-owned hospitals have been privatized. As an incentive to privatization, foreign investment in hospitals—up to 70% ownership—has been encouraged. Medical tourism (also called medical travel, health tourism or global health care) is the rapidly growing practice of traveling across international borders to obtain healthcare.

Such services typically include elective procedures as well as complex specialized surgeries such as joint replacement (knee/hip), cardiac surgery, dental surgery, and cosmetic surgeries. However, virtually every type of health care, including psychiatry, alternative treatments, convalescent care and even burial services are available. As a practical matter, providers and customers commonly use informal channels of communication-connection-contract, and in such cases this tends to mean less regulatory or legal oversight to assure quality and less formal recourse to reimbursement or redress, if needed.

Over 50 countries have identified medical tourism as a national industry. However, accreditation and other measures of quality vary widely across the globe, and there are risks and ethical issues that make this method of accessing medical care controversial. Also, some destinations may become hazardous or even dangerous for medical tourists to contemplate.

1. OBSERVATIONAL LEARNING

COLUMBIA ASIA GROUP OF HOSPITALS

1.1 COMPANY PROFILE

Columbia Asia is an international healthcare group operating a chain of modern hospitals across Asia with as many as 28 medical facilities across India, Malaysia, Vietnam and Indonesia. Columbia Asia Hospitals Pvt. Ltd.is one of the first healthcare companies to enter India through 100% foreign direct investment (FDI) route. The Columbia Asia Group is owned by more than 150 private equity companies, fund management organizations and individual investors.

Columbia Asia hospitals are clean, efficient, affordable and accessible. The innovative design of the hospitals, from their manageable size to their advanced technology, is focused on creating positive experience for patients.

The first hospital in India commenced operations in 2005 in **Hebbal** – Bangalore and currently Columbia Asia operates eleven facilities. The group has presence in **Ahmedabad, Bangalore, Mysore, Kolkata, Gurgaon, Ghaziabad, Patiala and Pune.**

MISSION:

"To deliver the best clinical outcomes in the most effective, efficient and caring environment"

VISION:

"We have a passion for making people better"

OUR MOTTO:

Customer First

OUR PEOPLE

We hire the best talent from healthcare and other industries, invest in training the employees and have numerous rewards and recognitions for them.

PATIENT-CENTERED CARE

we pride ourselves on our service standards, the people working with us and the clinical expertise extended to patients. Our mission is to provide effective and affordable care in a clean and caring environment.

We have a hospitality-based approach wherein our patients are treated as guests. Our processes are technology-driven, making it convenient for patients to use our services. All our medical programs are underpinned by an uncompromising belief and practice of ethics, excellence and strict clinical governance.

INFRASTRUCTURE AND SERVICES

Columbia Asia today serves more than one million patients every year. Columbia Asia

hospitals offer comprehensive clinical programs that are supported by a list of ancillary services (ICU, NICU, Physiotherapy, Referral lab, Tele radiology / Telemedicine, Pharmacy and Imaging facilities).

A comprehensive electronic medical records system forms the core of the Hospital Information System (HIS) that supports clinical decision making. While four of hospitals are already accredited by **NABH**, the rest are under process. Itcaters to healthcare needs of international patients from developed and developing countries.

NABH ACCREDITATION

National Accreditation Board for Hospitals & Healthcare Providers (NABH) is a constituent board of Quality Council of India, set up to establish and operate accreditation program for healthcare organizations. The board is structured to cater to much desired needs of the consumers and to set benchmarks for progress of health industry. The board while being supported by all stakeholders including industry, consumers, government, have full functional autonomy in its operation.

1.2 COLUMBIA ASIA HOSPITAL, PALAM VIHAR, GURGAON

Columbia Asia Hospital – Palam Vihar, Gurgaon, is a 90 bed multi-specialty facility situated in an upscale locality of the National Capital Region. The hospital began its services in July 2008 and has already become a preferred healthcare service provider for the residents and corporate entities of Gurgaon.

The hospital offers a wide range of clinical services such as Obstetrics & Gynecology, Internal Medicine, General Surgery, Pediatrics, Ophthalmology, Ear, Nose & Throat, Urology, Gastroenterology, Dermatology, Orthopedics, Reconstructive & Aesthetic Surgery, Smoking Session Clinic, Sleep Lab, Cardiology, Orthopedics, Neurology& spine surgery, Pulmonology. Qualified and experienced medical personnel and technicians ensure healthcare delivery of the highest standards.

It is today considered as one of the best hospitals in Gurgaon. The hospital has international standard infrastructure and follows globally benchmarked standards of medical, nursing and operating protocols and is rapidly becoming the preferred healthcare destination for International Patients.

1.3 SERVICES:

- CATH-LAB
- EMERGENCY ROOM
- BLOOD BANK
- LABORATORY
- PHARMACY
- ENDOSCOPY
- RADIOLOGY
- AMBULANCE
- OPERATION THEATER
- INTENSIVE CARE UNIT
- LABOR AND DELIVERY SUITE
- BARIATRIC SURGERY CLINIC
- BLOOD BANK
- CARDIAC SCREENING
- CANCER SCREENING
- NUTRITION & DIETETICS
- PSYCHOLOGY AND COUNSELING SERVICES
- AUDIOLOGY
- PHYSIOTHERAPY

1.4 FACILITIES

- DIAGNOSTIC IMAGING
- CT SCAN
- OPERATING THEATRE
- AMBULATORY & DAYCARE

- CAFETERIA
- NURSING UNITS
- PATIENT ACCOMODATION
- CLINICAL LABORATORY

COMPETITORS

FORTIS, MEDANTA, ALCHEMIST, PARAS,ARTEMIS AND MAX HEALTHCARE.

PROJECT REPORT

2.1 Introduction: -

Hospitals have continuously undergone changes in concept over the time of their inception. Modern medical technology has been proven to be the base of all changes in quality of healthcare. State of the art technologies has resulted in metamorphic changes in diagnostic and therapeutic procedures.

Medical equipment constitutes as much as 40-50% of the tertiary care set up and hence the costing shows in the carrying out the procedures as well, ultimately increasing out of the pocket expense for the patient. Since carrying out these procedures costs both the hospital as well as the patient, the overall quality of the diagnosis must be checked in order to meet the efficiency and effectiveness of the services.

2.2 Rationale

This study was carried out to observe and analyse the Quality control protocols of the Radiology Department at Columbia Asia Hospitals, Palam Vihar in order to understand efficiency and effectiveness of the department.

2.3 Mode of Data Collection

It is an observational and analytical mode of study.

2.4 Background

Department of Radiology is located on the ground floor of Columbia Asia Hospital, which provides 24 hour and Emergency services.

It has following Modalities

- Ultrasonography
- M.R.I (Magnetic Resonance Imaging)
- Mammography
- C.T Scan
- X-Ray

Picture Archiving and Communication System (PACS)technology is used in the department. It is a medical imaging and reporting tool. It is easy to apprehend and access and since it is universal for whole of the hospital, the data can be accessed by any employee who has the granted Id and unique Password to log in to the PACS. Image once taken by the system of any modality uploads it on PACS after the final reporting is done by the concerned Radiologist. The Department issues CD's of the procedure so done, which can be taken away by patients immediately if and when needed, otherwise mostly reports can be collected in the evening latest by 6 P.M with the films, if demanded by the patients.

Care 21 like ***PACS***is Columbia Asia's ingenious software which connects the whole of the organisation on one arena. It is interconnected as well, and every query regarding the patient is available on it.

For every radio diagnostic equipment, license has been granted by **Atomic Energy Regulatory Board** as per under the ***Atomic Energy (Radiation Protection) Act 2004.***

The Department can be visualised as a BIG U. On entrance, one arm of the Big U it has two Ultrasound rooms to the right followed by adjacent Reporting Area which is followed by one Ultrasound room. It has 3 Ultrasound Rooms, with 2 Fixed and 1

Portable Ultrasound Machine. At the end of the Department, bend of the Big U there is M.R.I room. From the entrance, on the other arm of the Big U there is one X-Ray Room followed by the C.T room and from the Console area of C.T it leads to Mammography room.

With 24 hours service guarantee, this department has its rotational based employees in the night shift.

Duration of the Study was for 2 months. A Total of 284 patients were studied.

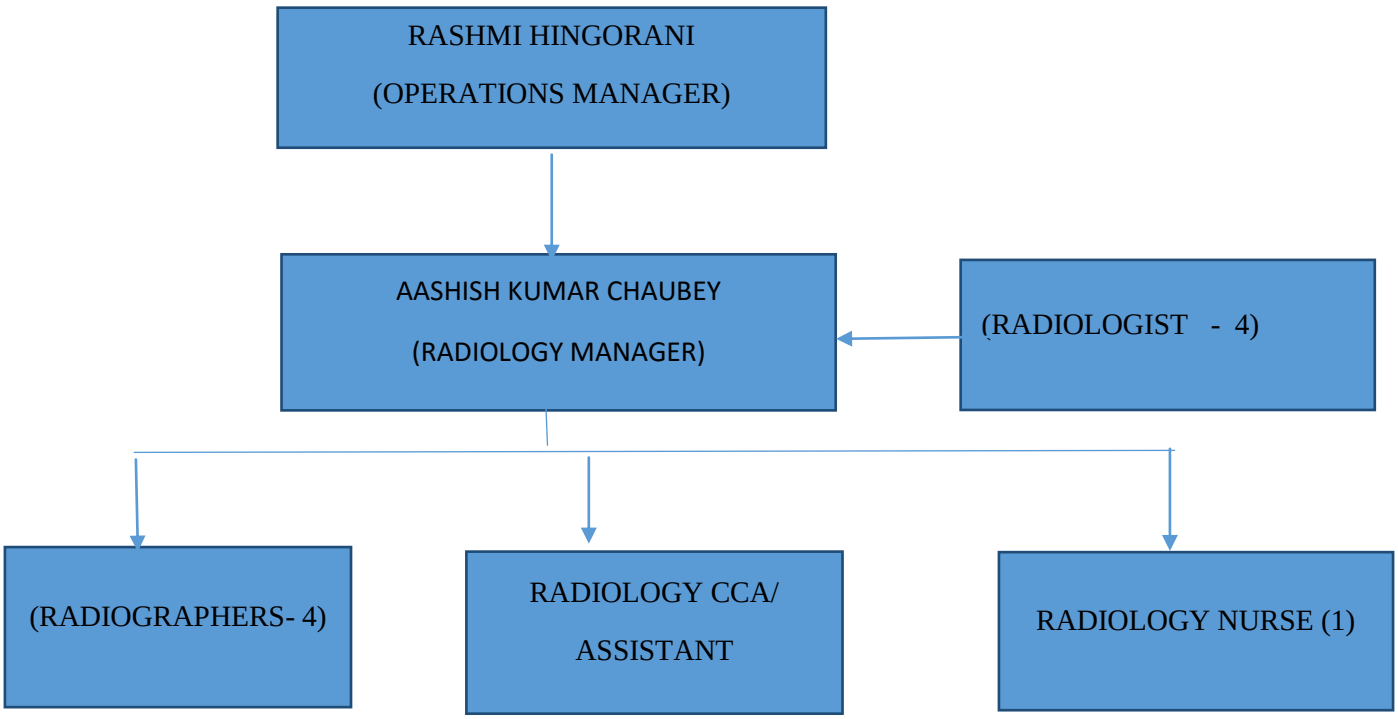
The Department has following modalities

- Ultra-sonogram
- Magnetic Resonance Imaging (M.R.I)
- C.T Scan
- Mammography
- X-ray

STATUTORY COMPLIANCES

- All laws, regulations, directives, guidelines and registration requirements of Atomic Energy Regulatory Board (AERB) & Pre conception and Pre-natal diagnostic test Act District Health and Family Welfare Office, Karnataka will be complied with.
- The Department has all time a valid and current AERB registration.
- All the radiographers maintain life time memberships with Karnataka Radiographers Association or Indian Association of Radiological Technologists.
- All staff will be provided with Thermo Luminescent Dosimeter (TLD)
- Registration Certificates – AERB layout for x-ray and Form B – from District Health & Family Welfare Office.
- Acts- PC & PNDT Act 1994, AERB Safety Code, The Bio-Medical Waste (Management and Handling) Rules, 1998.
- TLD badges are sent for monitoring of radiation dose every quarter.

2.5ORGANOGRAM



2.6 Modalities

2.6.1 Ultra-Sonogram

Medical ultra sonogram is a medical diagnostic technique based on the laws of ultrasound. Its prime aim is to find out any pathological condition or disease. The practice of obstetric ultrasound is also done here, which is of examining pregnant women. The ultrasound machine produces sound frequencies higher than 20,000Hz. The images so produced are called sonograms. Department of radiology has 3 ultrasound machines which includes 1 portable machine. The machines are of Siemens and Philips make. Ultrasound procedure usually takes half an hour but some procedures even take long enough to complete. The reports are usually dispatched in the evening to the respective patients email and it can also be collected from the department after 5 p.m.

2.6.2 Magnetic Resonance Imaging (M.R.I)

It is a medical imaging technology used to view the anatomical and physiological processing of the body. The organisation has 1.2 Tesla range M.R.I machine. It works on the principle of absorption and radiation of certain radio frequency by atomic nuclei under the influence of external magnetic field. An M.R.I procedure varies from 30 minutes to and hour long or may be more depending on the complication to be observed.

2.6.3 Mammography

Mammography diagnostic technique is used to see the physiological processes of the mammary gland. The department has one chamber for it. The process is usually 30-45 minutes long,

2.6.4 C.T Scan

The C T Scan machine used by the department is of 16 slice. C T stands for Computed Tomography or also the CAT scan. It produces a 3-D view of the area which is to be diagnosed. The images can be viewed in depth like in different planes such as axial, coronal and sagittal. The procedure usually takes around 20-25 minutes and it can be much more than the usual time depending upon the complications. The reports are usually given in the evening time.

2.6.5 X-ray

The X rays were discovered by William Roentgen. Ever since it has been a boon to mankind. X ray chamber is the busiest ones of the radiology department. Most of the patient flows occurs for this procedure.

X rays have wide used in the organisation. From emergency to daily basis, it has been used widely. For the protection of the patients and the technician's safety adherence protocols are also followed in the department. Each technician wears a TLD badge and while performing the function total safety is ensured from the radiation, for both the patient as well as the technician. The TLD badges are sent to AERB, Mumbai (Atomic Energy Regulatory Board) to check for the levels of radiation. And if some anomaly is find in those levels then the technician is given the proper follow ups and treatment according to the seriousness of the issue. Lead aprons are must for the patient if the x ray is not supposed to beam the trunk

region. The lead apron is also provided to patients attendant if patient is being accompanied by one. The level of dosage is maintained by the rules and is differs accordingly.

2.7 Quality Control Protocols

There are following quality control parameters of the Radiology Department.

- CLINICAL CO-RELATIONS
- RE-DO'S OF PROCEDURE
- ADDENDUMS
- PATIENT WAITING TIME

2.7.1 Clinical Co Relations

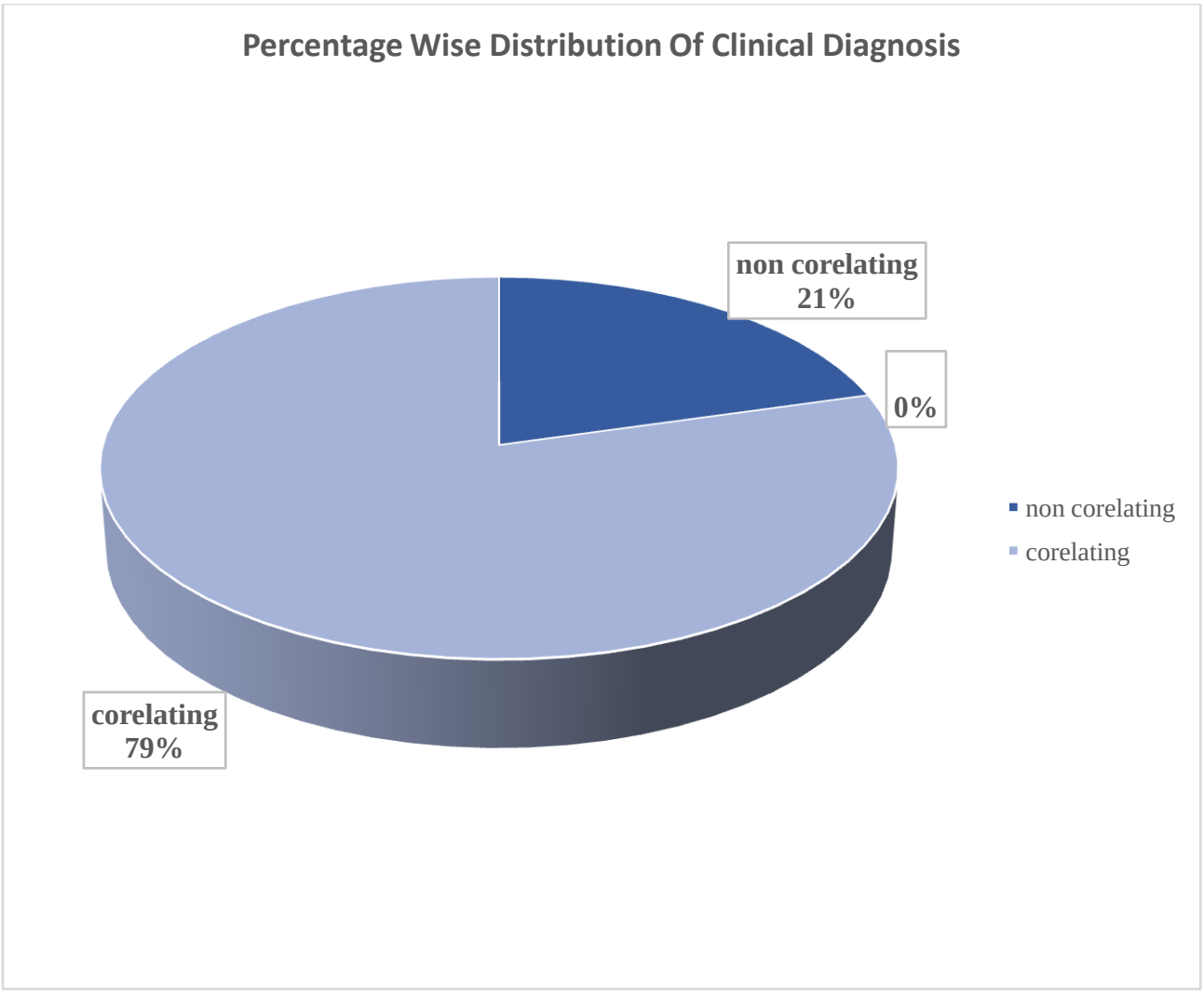
Clinical co relation is a procedure used by the department to check the coherency of the diagnostic procedure so recommended by the physician to the actual effectiveness of the procedure done.

A total of 125 patients were studied and the observed over the period of 2 months. It was found that out of the 125 patients who were prescribed of the certain radiological tests 26 of them were found to be not in no relation with the prescribed procedure. The diagnostic co relations were found among the 99 of the cases. It turned out that 79% were co relating and 21% were not. This shows the clinical accuracy of the prescription for the procedures. The recommended is more than 90%.

The organisation maintains its data and a quarterly analysis of the data is sent to the headquarters at Bangalore. The quality check is done by keeping the work efficient to reach the required mark of the clinical accuracy.

This ensures that the diagnosis so done is not going waste and the cost effectiveness is maintained. This is also to ensure unnecessary exposure to the radiation,

Clinical Co Relation



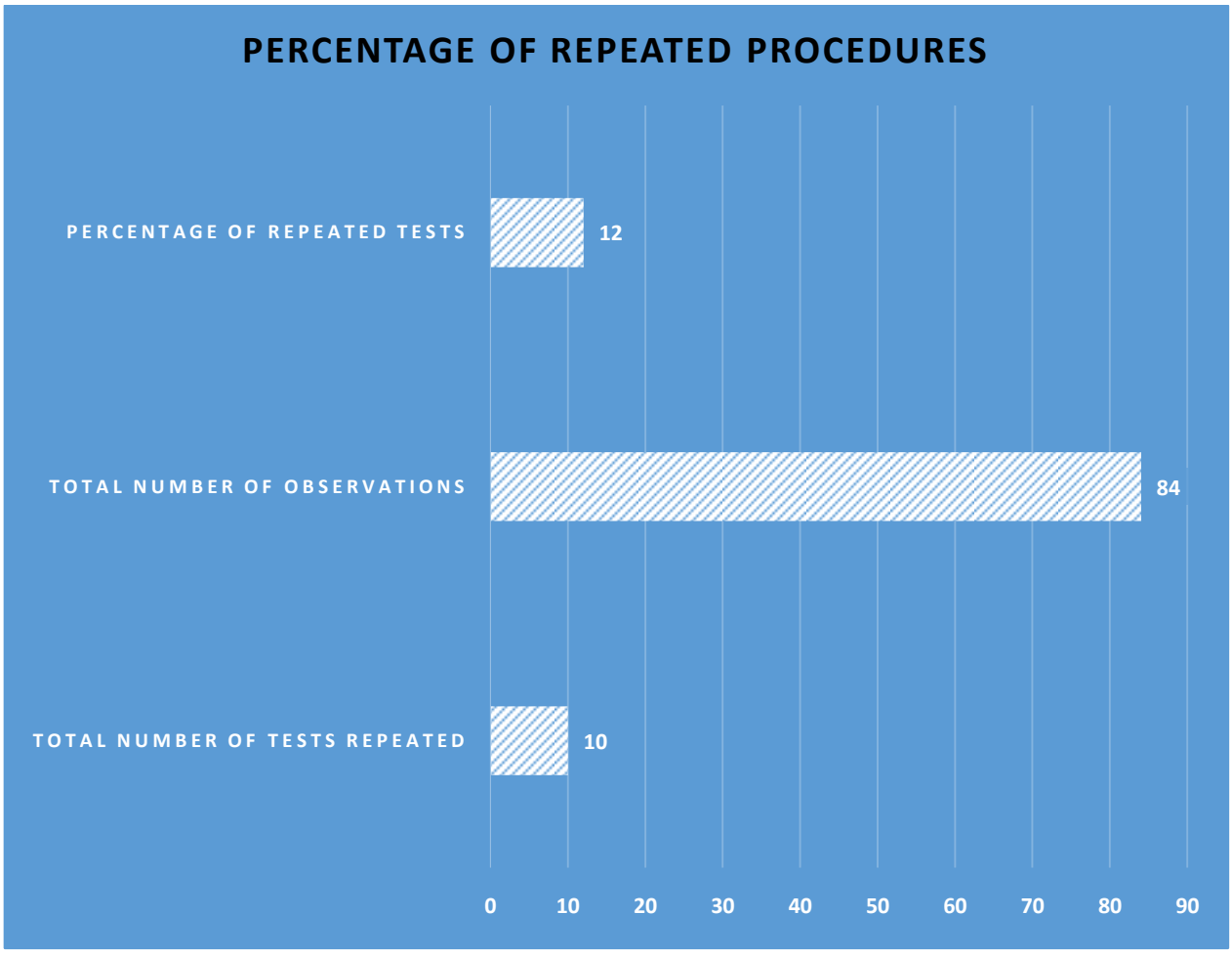
Co-relating - 79%

Non-correlating - 21 %

2.7.2 Re-Do's of The Procedure

Re do's of the procedure includes all those radio diagnostic procedures which are repeated due to technical error, human error or some other problems.

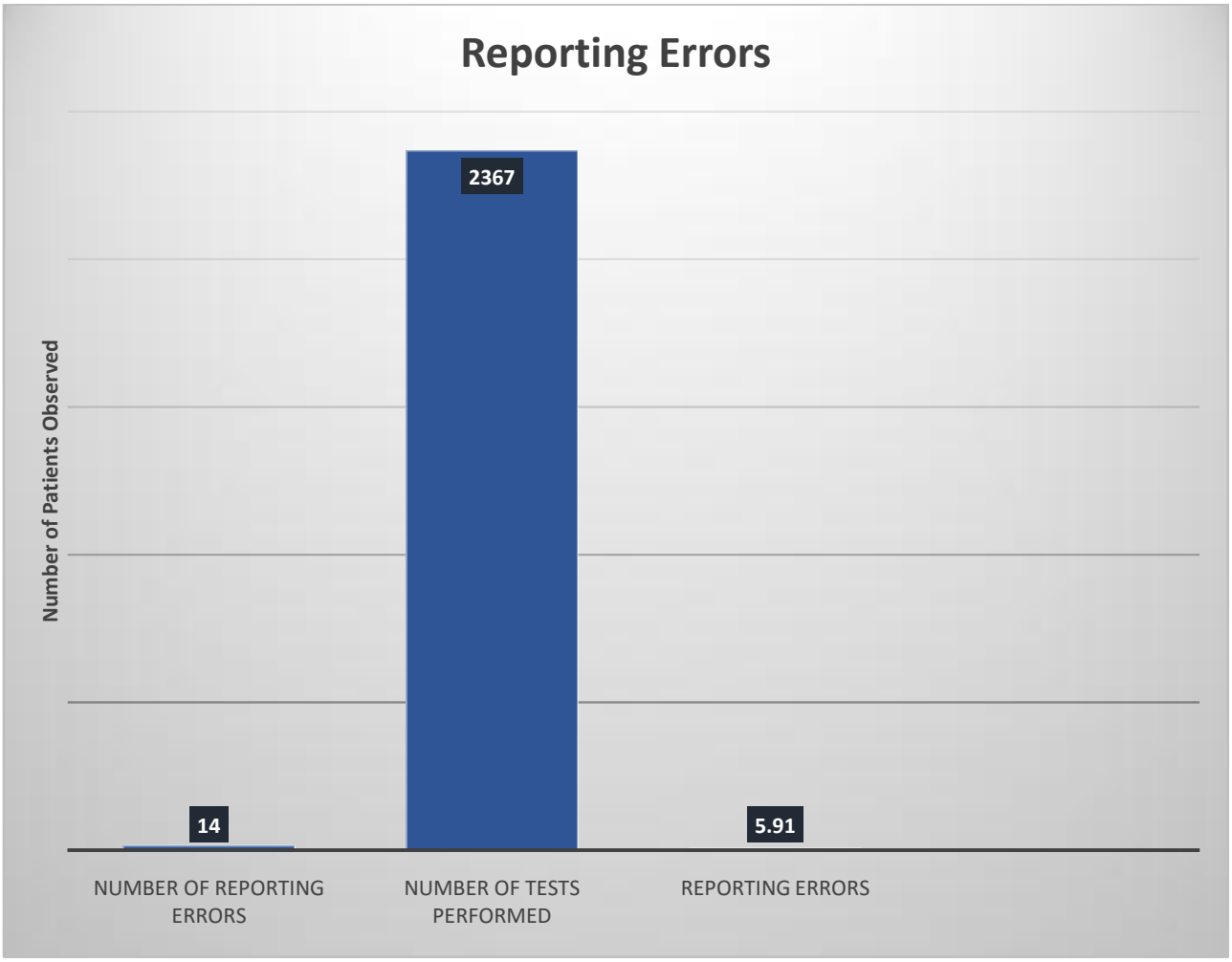
A total of 84 patients were studied and the observations were recorded. Out of this 10 procedures were repeated yielding a total repeat percentage of 12. The set level of the repeated procedures is 5 or below than 5 %.



2.7.3 Addendums

Addendums are also called the reporting errors. These errors occurs because of the faulty entry done by the radiographers, technicians or error in entry by the reporting doctors on the duty.

A retrospective analyses of the data shows following outcome.

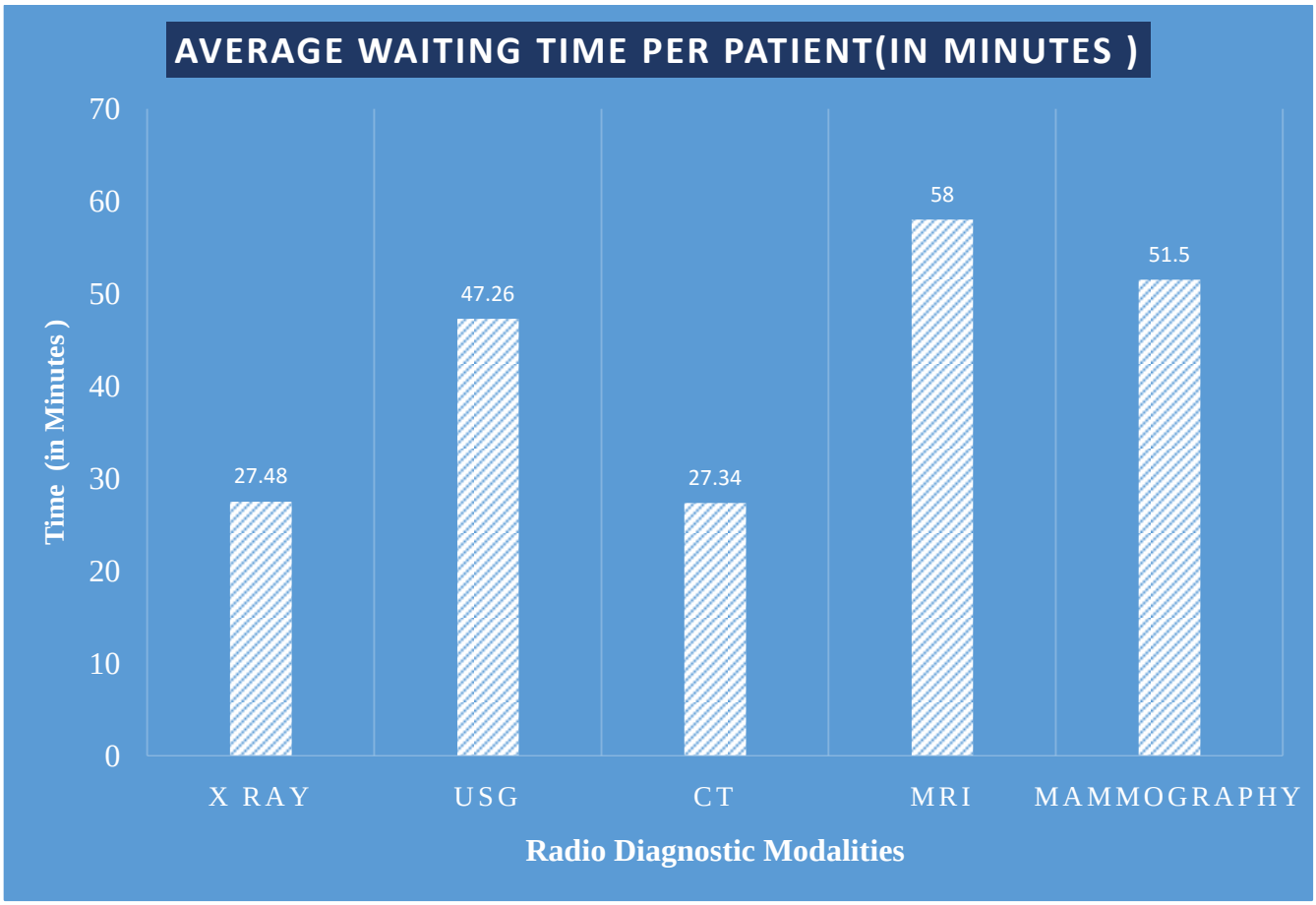


The error is under 10% which is accepted under the guidelines of the organisation.

2.7.4 Patient Waiting Time

This is a latest addition to the protocols of the quality control. A total of 75 patients were studied during this period and their total time taken from the moment the patient entered the

department till the time procedure was done was recorded. The clinical outcome for the following study is



The usual time for x ray is 5-10 minutes and the average is approximately 28 minutes.

The usual time for radiology is half an hour booked slot and the average is 48 minutes approximately.

The usual time for CT is 15-20 minutes and the average is 28 minutes.

For MRI usually it takes from 30 minutes to an hour and the average falls under this category.

Mammography usually takes 30 minutes and the average is 52 minutes.

CONCLUSION:

Quality control of the Department can be ensured by fusion of skills and technology. The best part of the working is that its software has provided one platform for all the functions,

which helps in cooperating the entire working of the department. In this study it is found that there is a need to increase the manpower of the department, lack of which is causing the delays in the procedures done. Skills of the employed technicians and other concerned members of the department should also be enhanced to meet the protocols of the organisation.

RECOMMENDATIONS

- To reduce the repetitions, technicians should be well trained.
- Repetition should be brought down to as low as 5 percent as repetition of the procedure automatically adds up to the wait time for the next patient and so on.
- Patient should be pre informed about the procedural guidelines for their full cooperation.
- X ray Film Positioning should be checked again before beaming.
- Unchecked appointment allotting leads to backlog and hence unrest amongst patients. At the time of allotting appointment slots, it should be checked that whether the previous procedure is going to exceed the ideal half an hour slot time. If yes, then the patient should be given the next slot.
- There should be an attendant at the reporting office who should be particular of only making entries.
- Availability of the Radiographers according to the given appointment slot should be checked.
- Clinical accuracy is of 79 %. Any accuracy higher than the available one is preferred. To achieve that the physicians must be made sure of the procedures before prescribing it to the patient.

References:

http://www.newhealthguide.org/Clinical-Correlation.html

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3868129/