Summer Placement

In

BLK-MAX SUPER SPECIALITY HOSPITAL

(18th April 2022-17th June 2022)

A study on analysis of laboratory critical value reporting and their compliance rate at BLK-Max hospital.

Presented By

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Post Graduate Diploma in Hospital and Health Management

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International Institute of Health Management Research, New Delhi

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FEEDBACK FORM

(Organization Supervisor)

Name of the Student: Dr. Lipika Singh

Summer Internship Institution: BLK-Max Super Speciality Hospital

Area of Summer Internship: Quality Department

Attendance: Good attendance

Objectives met: Critical value audit on floor done. Data analyzed & result published

Deliverables: Critical value data with analysis & result given

Strengths:

Suggestions for Improvement:

Vivek Gupta

Signature of the Officer-in-Charge (Internship)

Date: 17/06/2022
Place:

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FEEDBACK FORM

(IIHMR MENTOR)

Name of the Student: Dr.Lipika Singh

Summer Internship Institution: BLK-MAX SUPER SPECIALITY HOSPITAL

Area of Summer Internship: Quality Department

Attendance: Good attendance

Objectives met: Critical value audit on floor done
Data analysed and result published

Deliverables: Critical value data with analysis and result given.

Strengths:

Suggestions for Improvement:

Ranjan

Signature of the Officer-in-Charge (Internship)

Date: 03/11/2022
Place: IIHMR Delhi

Certificate of Approval

The Summer Internship Project of titled **"CRITICAL VALUE ANALYSIS"** at **"BLK-MAX SUPER SPECIALITY HOSPITAL"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the report only for the purpose it is submitted.

Raushan

Dr. Mukesh Ravi Raushan
Assistant Professor
IIHMR, Delhi

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ABBREVIATIONS:

IPD- INPATIENT DEPARTMENT

MICU- MEDICAL INTENSIVE CARE UNIT

ICCU- INTENSIVE CORONARY CARE UNIT

NICU-NEONATAL INTENSIVE CARE UNIT

NSICU- NEUROSCIENCE INTENSIVE CARE UNIT

CTVSICU- CARDIOTHORACIC AND VASCULAR SURGERY INTENSIVE CARE

PICU- PEDIATRIC INTENSIVE CARE

MBU- MULTI BED UNIT

SICU- SURGICAL INTENSIVE CARE UNIT

OTICU- ORGAN TRANSPLANT INTENSIVE CARE UNIT

KTICU- KIDNEY TRANSPLANT INTENSIVE CARE UNIT

GLICU- GASTRO AND LIVER INTENSIVE CARE UNIT

GLHDU- GASTRO AND LIVER HIGH DEPENDENCY UNIT

SOHDU- SURGICAL ONCOLOGY HIGH EPENDENCY UNIT

NH3- AMMONIA

TROP I- TROPONIN I

PCT- PROCALCITONIN

BNP- BRAIN NATRIRETIC PEPTIDE

K- POTASSIUM

Na- SODIUM

BLOOD C/S- BLOOD CULTURE

BLK-MAX SUPER MULTISPECIALITY HOSPITAL

BLK-Max Super Specialty Hospital is a member of one of India's major healthcare networks, with a diverse variety of services that make it a force to be reckoned with in the field of Super Specialty Tertiary Healthcare. There are 650 beds, including 125 critical care beds, 17 operating theatres, and specialty-specific OPD blocks.

BLK-Max has constantly been recognised among Delhi NCR's Top 10 Multi Super Specialty Hospitals.

TomoTherapy (Next Generation Image-guided Intensity-modulated Radiation Therapy for Cancer Treatment); Robotic Surgical System; India's First Computer Navigation for Joint Replacement; South Asia's First Signa Artist MRI; Revolution Frontier CT; Flat Panel Combo Cath Lab with 3D reconstruction; Ultrasound with 3D and 4D imaging; Dual Head Spect CT with variable angle BLK-Advanced Max's Centers of Excellence, cutting-edge facilities, and patient-centered services form the foundation for a holistic, comprehensive, and cutting-edge treatment strategy.

A passion for healing...

We are committed to providing the greatest quality healthcare at BLK-Max. Whether it's the best doctors, cutting-edge medicine, cutting-edge infrastructure, or smiling nursing. Nothing is too large or small to ignore when you are enthusiastic about restoring the lives that have been entrusted to us.

LEGACY:

In 1930, Dr. B L Kapur, a renowned obstetrician and gynaecologist, established a Charitable Hospital in Lahore. He migrated to post-partition India in 1947 and established a Maternity Hospital in Ludhiana. Dr. B L Kapur, on the invitation of the then-Prime Minister, began the effort to build a 200-bed hospital in Delhi in 1956. On the 2nd of January, 1959, Prime Minister Pt. Jawahar Lal Nehru opened the hospital.

The hospital become Delhi's leading multispecialty institute by 1984, when it celebrated its Silver Jubilee. Apart from mother and child care, the hospital provided general surgery, ophthalmology, ENT, dentistry, pulmonology, Intensive Care, and Orthopedics.
The community's health was an important consideration for the facility. To enhance the state of community health in the area, enthusiastic doctors organized camps and public health speeches.

The Lahore Hospital Society was formed, in 1942. The Lahore Hospital Society was founded by some of the most well-known physicians and benefactors of the day, and they contributed significantly to the development and management of the hospital.

BLK-Max Super Specialty Hospital was redeveloped and re-launched as a Multi Super Specialty facility with 650 beds, including 125 beds dedicated to critical care and 17 operation theatres, providing patients with a seamless integrated healthcare experience. The prestigious NABH and NABL accreditations were given to it as the first hospital in India.

Vision

- To be the best-rated healthcare organisation in India, committed to the highest levels of clinical excellence and patient care, and supported by cutting-edge research and technology.

Mission

- Achieve Professional Excellence in Quality Care Delivery.
- Ensure that care is delivered with honesty and integrity.
- Through research and education, push the boundaries of care.
- Adhere to national and international healthcare standards.
- Ensure that all members of society have access to high-quality healthcare.

QUALITY & ACCREDATION

Joint Commission International

NABH

ilac - MRA

Quality Policy

- Meeting the evolving requirements and expectations of patients, as well as the hospital's vision and goal
- Incorporate quality into all of its services and maintain it through national and international accreditations.

Specialties:

- Surgical Gastroenterology, Advance Laparoscopic & Bariatric Surgery
- Dental & Maxillofacial Surgery
- Dermatology
- Emergency & Acute Care Medicine
- Diabetes, Thyroid, Obesity, and Endocrinology Centre
- ENT & Cochlear Implant Centre
- Centre for Women's Health
- Hepato Pancreato Biliary Surgery
- Internal Medicine
- Interventional Radiology
- IVF & Infertility Treatment
- Liver Transplantation
- Nuclear Medicine
- Nutrition & Health
- Ophthalmology
- Pain Management
- Laboratory Services
- Physiotherapy & Rehabilitation
- Psychiatry
- Radiology & Imaging
- Rheumatology
- Podiatry (Foot Care) & Wound Care

Centres of Excellence

- Cancer Centre
- Bone Marrow Transplant Centre
- Heart Centre

- Centre For Neurosciences
- Institute For Digestive & Liver Diseases
- Centre For Renal Sciences & Kidney Transplant
- Institute For Bone, Joint Replacement, Orthopaedics Spine & Sports Medicine
- Centre For Chest & Respiratory Diseases
- Centre For Plastic & Cosmetic Surgery
- Centre For Child Health

State of the art equipment:

- Endoscopy Suites
- MRI
- CT Scan
- Nuclear Medicine
- Tomotherapy System
- Robotic Surgery System
- Computer Navigation System

FLOORS	DEPARTMENTS
BASEMENT	Physiotherapy (neuro rehabilitation ,sports medicine) Radiation oncology In patient billing Medical Record Department LT room Parking

GROUND FLOOR	Reception Admission & discharge OPD Pharmacy Emergency Transfusion medicine Pre Anesthesia Chekup clinic Interventional Radiology Waiting lounge **OPD 1** : ENT & Cochlear implant, internal medicine, pediatric & pediatric surgery,general & minimal acess surgery, orthopadics,rheumatology, Podiatry, psychiatry & psychology, dermatology **OPD 2 :** gynaecology & obstetrics Diagnostic : Mamography , Radiology, Nuclear medicine, sample collection Financial councling Cafeteria
1st Floor	International patient lounge Laboratory services Dental science OPD 3: cardiology & cardiac surgery, vascular surgery, non-invasive cardiology , nephrology & kidney transplant, urology, endocrinology, diabetes & thyroid, respiratory medincine, executive health check up, ophthalmology, Ayurvedic medicine, OPD 5 : Gasteroentrology, hepatology, GI surgery, HPV surgery & liver transplant OPD 6 : dialysis OPD 7 : medical & surgical oncology,BMT & HEMATO ONCOLOGY, radiation oncology OPD 8 : neurology & neuro surgery, neuro electrophysiology

2nd FLOOR	OT Cathlab MICU SICU CTVS ICU ICCU OT-ICU NSICU KT-ICU Pre & post operative area
3RD FLOOR	In patient rooms Surgical onco HDU Neuro HDU Bronchoscopy ECP Sleep lab Dialysis unit 2
4th FLOOR	In patient room / MBU PICU NICU & HDU Birthing suits LR,Labour OT, Nursery
5TH FLOOR	In patient rooms Chemotherapy & day care
6th floor	In patient rooms GL-ICU & GL-HDU Bone marrow transplant unit

7TH FLOOR	In patient rooms OT Plastic & cosmetic surgery Bone marrow transplant unit Administration area

GENERAL FINDINGS ON LEARNING:

For first one month in quality department work was done on IPSG (INTERNATIONAL PATIENT SAFETY GOALS). Audits were done to check whether the hospital was following all the IPSGs or not. It helps well-known organisations address specific areas of concern in some of the most difficult areas of patient safety.

2017-2021 version of IPSGs:

- Goal 1: Make sure you're appropriately identifying patients.
- Goal 2: Boost communication effectiveness.
- Goal 3: Ensure that high-alert drugs are as safe as possible.
- Goal 4: Ensure that the procedure is carried out in a safe manner.
- Goal 5: Lower the risk of infections brought on by medical care.
- Goal 6: Lower the chances of a patient being injured due to a fall.

For the second month in quality department work was done on critical value analysis.

Section 2: Project Report

TITLE OF THE STUDY:

A study on analysis of laboratory critical value reporting and their compliance rate at BLK-Max hospital.

INTRODUCTION:

To communicate a critical value to patient care providers in a clear, accurate, and timely manner is one of the important functions of a clinical laboratory. A pathophysiological state that is sufficiently different ranging from being harmless to becoming fatal unless immediate action is taken, and for which some form of treatment is available. Idea behind the increase of critical value notification is that prompt reporting will lead to more timely therapeutic interventions, which will enhance treatment outcomes and reduce co-morbidities.

Lundberg was the first to identify critical value, and it was widely accepted by laboratories after his observation. When reporting critical values, laboratory professionals must overcome challenges such as developing clinically appropriate critical value standards, addressing challenges reaching the doctor who requested the report when a critical value is received, and assuring that the doctor understands the severity and consequences of a critical result. Critical value reporting is now required for accreditation, and most laboratories have critical value procedures in place as a quality assurance practise. The importance of critical value necessitates are rapid reporting, treatment, or more intensive care. To ensure that the critical value reporting procedure is successful, the factors involved must be understood and addressed by the organization.

This study was conducted to analyse the compliance rate of action taken by the doctors against the critical value of the patients. A study sample of 250 patients were taken in the duration of one month. Primary data was collected from the microbiology and biochemistry laboratories and then with the help of checklist further data was collected from doctor's progress notes which is present inside patient's record file where patient is admitted at that point of time.

RESEARCH QUESTION:

What is the compliance rate of action taken by the doctors against the documentation of critical value of the patients?

OBJECTIVES:

1) Primary Objective:
   To assess the compliance rate of documentation of the critical value by the doctors of BLK-Max during the period of 10th May 2022 to 10th June 20.

2) Secondary Objective:
   To ensure the appropriate action taken by the doctor against the critical value of the patient.

REVIEW OF LITERATURE:

1. Arbiol-Roca, A. *et al.* (2019)- To compare their findings to those in the literature, they examined critical value data and reporting methods across a 6-month period in this study. Their study's goal was to evaluate the scenario in their lab for the notification of critical values in order to identify the strengths and shortcomings so that they might enhance the entire procedure.

2. Bhatia, K. *et al.* (2019)- The goal of the study was to pinpoint areas of practise that needed to be enhanced if medication mistakes were to be decreased and patient safety increased. At first, all critical values reporting-disease diagnosis, name of investigation, date of investigation, reported by, time of report generation, reported to, action done on critical report, consultant signature, and appropriateness of response- were judged to be 100% compliant. 97.22% of reports are submitted on time, while 63.88% of critical value reports are submitted on time. Following the delivery of training sessions, all criteria for critical value reporting compliance were at 100%, with the exception of the critical report stamp, which climbed to 72.22%. For inpatients, the average time it takes to receive a report in the event of a critical value report is 5 minutes.

3. Bhutani, Namrata and Bhutani, Neha (2020)- In this study, they sought to compare the frequencies for various parameters with the information

available from other studies by analysing the critical values data collected over a two-month period in the emergency laboratory setting at a tertiary care hospital in New Delhi, India.
Three months, from July to September 2019, were used to retrospectively assess the emergency biochemistry samples. 183056 tests in total were analysed for the research's purposes throughout the study period, and the Olympus AU 480 analyser produced 11875 critical alarms overall.

4. Desai, K. N. and Chaudhari, S. (2017)- A study done at the Shree Krishna hospital, Karamsad, from January 2012 till December 2013. All information was gathered from reports produced by the haematological and clinical pathology labs and entered into the crucial call back log. 19,423 critical values were reported by the laboratory for haematological and clinical pathology. Testing conducted at the haematology laboratory was the main cause of critical callbacks (78.4%). Hemoglobin and urine ketones were the analytes that were called back the most frequently. Maximum inpatient callback rates were 52.7%, followed by emergency department callback rates of 34.2% and outpatient department callback rates of 13.1%. The average time it took to get information from the important callback register to the ordering clinician or the patient location was 20 minutes for ED, 30 minutes for OPD, and 21 minutes for IPD.

METHODOLOGY:

Study design and setting:

A descriptive cross-sectional study design was done at the laboratories of BLK-Max hospital.

Study population:

INCLUSION- Patients whose critical values are mentioned in the critical alert register at BLK -MAX lab.

EXCLUSION- Patients whose critical values aren't mentioned in the critical alert register at BLK -MAX lab.

Sample size:

250 patients.

Study tool:

A checklist was prepared according to the needs of the study. Observational checklist included different criteria for compliance of critical value reporting as under:

1. Max UHID
2. Location
3. Test
4. Value
5. Informed by
6. Time of informing
7. Informed to
8. Action taken documented
9. Time of action taken

MAX ID	LOCATION	TEST	VALUE	INFORMED BY	TIME OF INFORMING	INFORMED TO	ACTION TAKEN DOCUMENTED	TIME OF ACTION TAKEN

Method of data Collection:

Primary data was gathered from laboratories critical alert registers.

RESULTS:

During one month study duration, our BLK-Max hospital laboratories conducted 600 tests of critical value. From the sample of 250, that was taken from the microbiology laboratory and biochemistry laboratory, it was observed that non-compliance (71%) is comparatively greater than compliance (29%) which means doctors were not documenting the critical values on the doctor's progress notes.

After the analysis, number of compliance rate for Trop I is 23/63, for BNP is 14/52, for NH3 is 1/6, for K is 18/58, for Na is 3/13, for Blood c/s is 6/33, and for PCT is 7/21 on the other hand number of non-compliance rate for Trop I is 40/63, for BNP is 38/52, for NH3 is 6/7, for K is 40/58, Na is 13/16, Blood c/s is 27/33 and for PCT is 14/21.

Percentage of compliance rate for Trop I is 36.5%, for BNP is 26.92%, for NH3 is 14.28%, for K is 31.03%, for Na is 18.75%, for Blood c/s is 18.18%, and for PCT is 33.33% and on the other hand percentage of non-compliance rate for

Trop I is 63.49%, for BNP is 73.07%, for NH3 is 85.71%, for K is 68.96%, Na is 81.25%, Blood c/s is 81.81% and for PCT is 66.66%.

Z Score for Trop I is -3.029, for BNP is -4.7068, for NH3 is -2.6726, for K is -4.0853, for Na is -3.5355, for Blood c/s is -5.1698, and for PCT is -2.1602.

P Value for Trop I is 0.00244, for BNP is 0.00001, for NH3 is 0.00758, for K is 0.00001, for Na is 0.0004, for Blood c/s is 0.00001, and for PCT is 0.03078.

P Value less than 0.05 interprets that the results is statistically significant, corelation is seen amongst the variables taken.

The analysis of critical value is shown in the table no. 1 and graphs namely graph no.1 and graph no.2 as well.

TESTS	C (%)	NC (%)	C	NC	TOTAL	Z SCORE	P VALUE
TROP 1	36.5	63.49	23	40	63	-3.029	0.00244
BNP	26.92	73.07	14	38	52	-4.7068	0.00001
NH3	14.28	85.71	1	6	7	-2.6726	0.00758
K	31.03	68.96	18	40	58	-4.0853	0.00001
Na	18.75	81.25	3	13	16	-3.5355	0.0004
BLOOD C/S	18.18	81.81	6	27	33	-5.1698	0.00001
PCT	33.33	66.66	7	14	21	-2.1602	0.03078

Table No.1- Analysis of critical value according to tests.

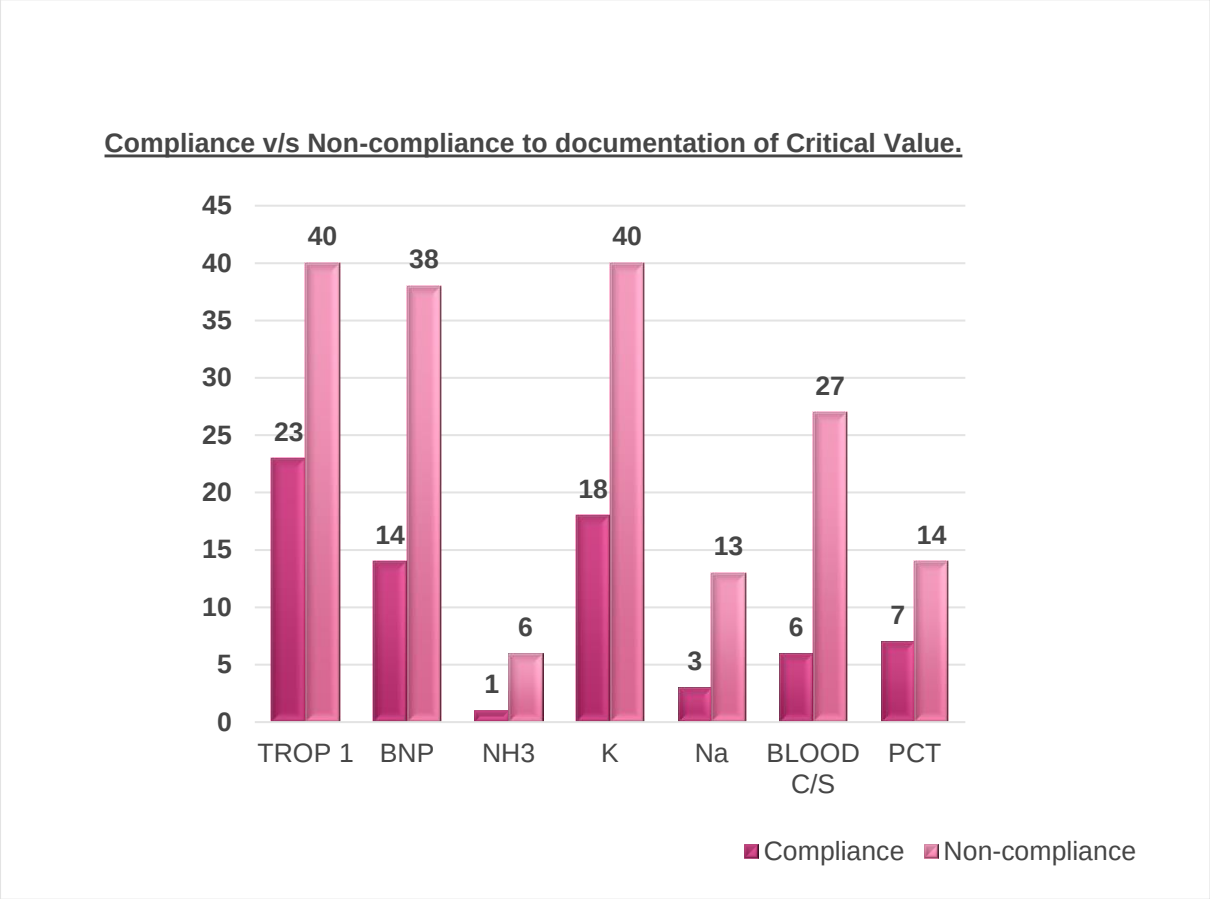

Figure 1: Shows comparison between the compliance and non-compliance to documentation of Critical Value in progress report by the doctors.

After analysing the sample of 250 patients the total number of compliance rate is 72 and total number of non-compliance rate is 178 which has been shown in table no.2 and in the form of a pie-chart as well in graph no.3.

COMPLIANCE	NON-COMPLIANCE	TOTAL
72	178	250

Table no.2- total compliance and non-compliance rate.

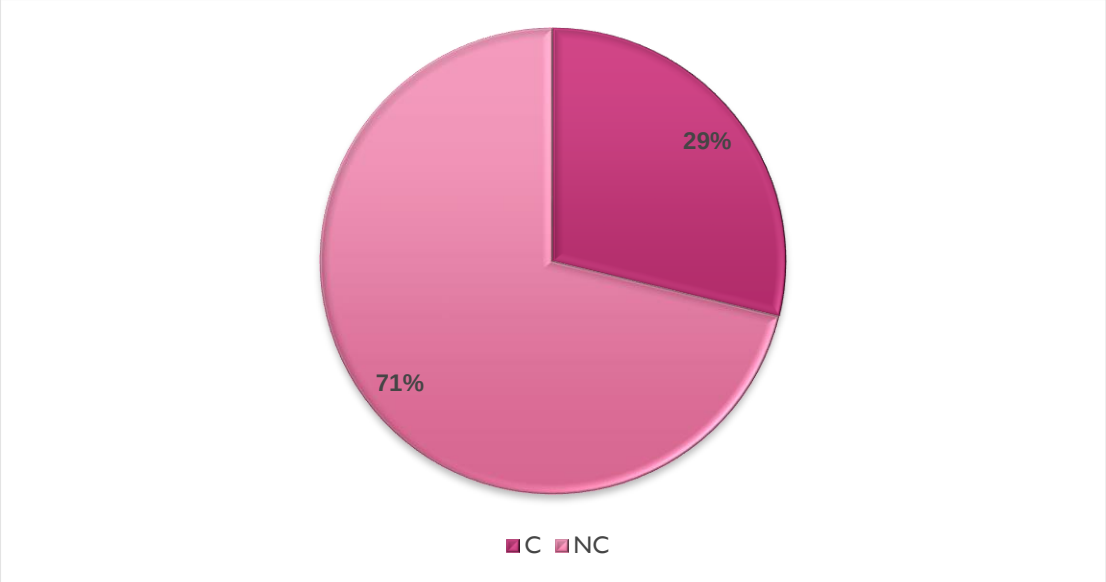

Figure no.2: pie-chart showing total number of compliance and non-compliance rate (%)

LIMITATIONS:

- Due to time constraints, the sample size was reduced.
- Only IPD patients were included.
- Unavailability of doctors due to busy schedules.
- No direct contact with the doctors.

DISCUSSION:

Critical value can be defined as numerical assessment of a physiological condition. The numerical value is linked to an evidence-based risk of bad outcome if therapeutic care is not prioritised, and it can be judged to be abnormal by deviation from a mean value. Despite the fact that the vast majority of clinical laboratory results have diagnostic and therapeutic implications that do not demand rapid medical action, laboratory findings can occasionally be significantly changed, signalling a potentially fatal consequence for the patient.

This study was conducted to assess whether the doctors are taking action against the critical value of the patients or not. In this study the sample of 250 patients were analysed. Primary data was collected from the critical value registers of the BLK-Max hospital laboratories mainly from biochemistry and microbiology laboratories. Then with the help of MRD number patient site was identified and audit was conducted on the site of the patient. Then further data was collected with the help of a checklist which was prepared for this study which includes Max UHID, location, tests, values, informed by, time of informing, informed to, action taken documented, and time of action taken. On the site of the patient doctor's progress notes were checked whether the critical value of the particular test was documented or not. If the critical value was documented then the action taken was noted as compliance and if the action taken was not documented then it was noted as non-compliance. When the action taken was noted as compliance for that time of action taken was documented whether the action taken for the patient was on time or not.

The main sites for these audits were ICCU, KTICU, OTICU, MICU, NSICU, CTVS ICU, SICU, NICU, PICU, GLICU, GLHDU, SOHDU, MBU, wards of third, fourth, fifth, sixth and seventh floors.

After the collection of data it was analysed and it was observed that the non-compliance rate was more (178/250) than that of the compliance rate (72/250) which means the doctors were not documenting the critical values of the patients on the doctor's progress note which is a major concern because critical value tests are performed when there is a life-threatening situation for patient so it should be documented properly on time.

From this study it is recommended that the doctor's progress notes should be checked regularly for the proper documentation of the critical values. And training sessions should be conducted for doctors for decrease in critical value documentation errors and for better favourable patient outcome.

RECOMMENDATION:

- In order to improve the compliance rate for critical value of patients, BLK-Max should conduct training sessions for doctors and other caregivers.
- BLK-Max should conduct regular audits to check whether the doctors are documenting the critical values in doctor's progress notes.
- There should be relevant doctor available to respond to the critical value report of the patient.
- The most prevalent conventional practise of telephonic system that might be improved and upgraded electronic system that helps to inform critical value reports straight to the corresponding ward/ICU setting by checking patient's unique identifying number.
- To improve patient safety, the critical value alarm can help with faster and more accurate reporting as well as lowering mortality.

CONCLUSION:

Critical value reporting is an important aspect of the clinical laboratory testing procedure, and if the criteria aren't properly matched, the process will fail. New communication processes will emerge as a result of the development of new automated reporting systems, and notice times will be reduced. Doctors training sessions should be held more frequently in order to further reduce critical value criteria errors and improve patient outcomes. The ultimate goal should be to get these values to the proper person as quickly as possible, so that doctors can treat patients immediately away and enhance their overall prognosis.

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