Summer Internship Project Report

AT

Max Smart Super Specialty Hospital, Saket, New Delhi.

(April 22nd2024, to June 21st, 2024)

TOPIC - RATIONAL USE OF BLOOD AND BLOOD COMPONENTS DURING BLOOD TRANSFUSION IN A MULTISPECIALITY HOAPITAL OF NEW DELHI, INDIA.

Submitted by-

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Post Graduate Diploma in Hospital and Health Management

(2023-2025)

(PG/23/090)

International Institute of Health Management Research, New Delhi.

ACKNOWLEDGEMENT

A summer internship presents an invaluable opportunity for personal growth and skill development. I feel privileged to have had the chance to undergo summer training at MAX SMART SUPER SPECIALITY HOSPITAL in Saket, New Delhi.

During my tenure at this esteemed organization, I had the privilege of interacting with numerous individuals who generously shared their knowledge and experiences with me.

I am deeply grateful to **Ms. Kanika Bhatt,** Quality Manager in the Medical Administration Department, for her unwavering guidance. Despite her busy schedule, she took the time to listen to me, offer invaluable advice, and provide constructive feedback throughout the project. Her assistance was indispensable to the successful completion of this endeavor.

I would also like to extend my gratitude to **Dr. Pijush Kanti Khan**, Assistant Professor, for his continuous support and guidance during my internship.

Lastly, I express my heartfelt thanks to my family and friends whose support was instrumental in the development of this project.

ABBREVIATIONS

CPRS- Computerized Patient Record System.

WHO -World Health Organization.

BT- Blood transfusion.

EHR – Electronic Health records.

Nephro- Nephrology Department.

Cardio – Cardiology Department.

Onco – Oncology Department.

Pt. – Patient.

CKD – Chronic Kidney Disease.

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OBSERVATIONAL LEARNINGS

INTRODUCTION.

MAX SMART SUPER SPECIALITY HOSPITAL SAKET, NEW DELHI, INDIA.

Max Healthcare Institute Limited, headquartered in Delhi, is a leading Indian private hospital chain operating a network of 19 hospitals across North India, collectively offering over 4000 beds. Within its diversified offerings, Max Institute of Medical Excellence (MIME) conducts comprehensive training programs spanning various medical disciplines. Max Lab, positioned as the third-largest diagnostic chain in North India, delivers diagnostics and pathology services through its network of labs and collaborative partnerships.

Max@Home, a subsidiary service of Max Healthcare, specializes in home care, home health nursing, house calls, and pharmaceutical delivery, among other patient-centric services.

Max Smart Super Specialty Hospital in Saket, a unit of Gujarmal Modi Hospital & Research Centre for Medical Sciences, boasts a 250-bed capacity and is equipped with 12 advanced modular operation theatres, an emergency resuscitation and observation unit, 50 critical care beds, a dedicated endoscopy unit, and an advanced dialysis unit. It serves as a tertiary care facility offering specialized medical services in Cardiac Sciences, Orthopedics, Urology, Neurology, Pediatrics, Obstetrics, and Gynecology. Notably, the hospital features state-of-the-art medical equipment including a 256 Slice CT Angio, 3.0 Tesla digital broad band MRI, Cath Labs with electrophysiology navigation, and a flat panel C-Arm detector.

With a team comprising over 300 specialist doctors, dedicated nursing staff, and cutting-edge medical technology, Max Smart Super Specialty Hospital, Saket is committed to delivering superior medical care from patient admission through discharge. The hospital emphasizes integrated healthcare in a multidisciplinary environment, underpinned by highly qualified doctors, nurses, and healthcare professionals.

Max Smart Super Specialty Hospital, Saket is recognized as a regional center of excellence for complex medical procedures, encompassing neurovascular interventions, targeted cancer treatments, heart surgeries, orthopedic surgeries, renal care, bariatric procedures, and treatments in pediatrics, obstetrics, and gynecology.

TECHNOLOGY & INFRASTRUCTURE

Intra-Operative & Portable CT scanner with Navigation

Digital Orthopaedic Suite for Hip and Knee Joint Surgery

4D ECHO Machine

Bi-Plane Digital Cath lab

MRI 3.0 Tesla

Dexa scan

Optical coherence Tomography.

EEG

Ultrasound

CRRT

Fluoroscopy

VISION-

To be the most well regarded healthcare providers in India committed to the highest standards of clinical excellence and patient care,supported by latest technology and cutting edge research.

PURPOSE

- To Serve .

With commitment and compassion in our hearts, we deliver the highest standards of patient-centered care to those we serve.

- To Excel.

From a dream team of doctors and specialists to support staff that goes the extra mile to deliver quality care , excellence is in our DNA.

VALUES

- **COMPASSION-** We have a deeper level of patient understanding and are always empathetic to their needs. This encourages a culture of providing a high standard of patient -centered care. We respect each other and our patients, ensure that their needs are met with dignity. We rise to the occasion each time for we recognise the positive social impact we can create.
- **EXCELLENCE –** We ask more ourselves and are always passionate about achieving the highest standards of medical expertise and patient care. We understand that being the best is a continuous journey of becoming better versions of ourselves every day.
- **CONSISTENCY –** We always deliver on our commitment and ensure the highest level of patient care is met at every stage , every time. We believe that only through consistency can we achieve our patients' trust and fulfil our goals.
- **EFFICIENCY -**We create a responsive healing environment , by being nimble to the needs of our patients and delivering what they really need with precision and timing. We are focused yet fast, personal yet practical, advance yet seamless in delivering the exact care our patients need.

SCOPE OF SERVICES:

- Pediatrics
- Nephrology
- Oncology
- Neurology
- Neurosurgery
- Internal Medicine
- BMT
- Gynecology
- ENT
- Endocrinology
- Pulmonology
- Dental
- Orthopedics
- Cardiology
- Dermatology
- General Medicine
- Nuclear Medicine

PROJECT REPORT

SECTION -1

INTRODUCTION ABOUT THE TOPIC.

A blood transfusion involves administering donated blood through a small tube inserted into a vein in your arm. This procedure is crucial for replacing blood lost due to surgery, injury, or when your body is unable to produce blood effectively due to illness.

Individuals with chronic kidney disease (CKD) are nearly twice as likely to develop anemia compared to the general population. As CKD progresses, the severity of anemia increases significantly, primarily due to impaired kidney function and the build-up of uremic toxins that disrupt erythropoietin production.

This study aimed to evaluate the appropriate utilization of blood and its components according to WHO guidelines in a tertiary care hospital.

The following are the WHO guidelines for transfusion of blood components.

Whole blood-

- Indicated only in massive bleeding.
- Exchange transfusions
- Where red cell concentrates are not available.

- **Hb trigger for Red Cell Concentrates-**
- <7g/dl: Indicated if signs of impaired oxygen transport are present, with lower thresholds applicable in conditions such as sickle cell anemia or iron deficiency.
- 7-8g/dl: Recommended preoperatively and for surgeries associated with significant blood loss.

- <9g/dl: Considered in patients under chronic transfusion regimen or marrow suppressive therapy.

- **Platelet count triggers for transfusion:**
  - <10,000x10^3 /µl: Recommended as prophylaxis in bone marrow failure.
  - <20,000x10^3 /µl: Advised in bone marrow failure with additional risk factors, fever, or systemic hemostatic failure.
  - <50,000x10^3 /µl: Suggested for cases of massive hemorrhage, patients undergoing surgery or invasive procedures, or those with disseminated intravascular coagulation (DIC).
  - <100x10^3 /µl: Necessary prior to brain or eye surgeries, or in any bleeding patient where thrombocytopenia significantly contributes.

- **Fresh Frozen Plasma (FFP) trigger for transfusion:**
  - Indicated when PT and PTT exceed 1.5 times the upper limit of the normal range. This applies to conditions like DIC, warfarin overdose, bleeding with abnormal coagulation parameters, and in patients with liver disease or undergoing cardiac bypass surgeries.

TRANSFUSION REACTION

Transfusion reactions are adverse occurrences following the administration of whole blood or its components. These events vary in severity, ranging from minor inconveniences to life-threatening incidents. They can occur either during the transfusion process itself (acute transfusion reactions) or days to weeks later (delayed transfusion reactions). These reactions may result from immune-mediated mechanisms or non-immune-related factors. Types of transfusion reactions include acute hemolytic reactions, delayed hemolytic reactions, febrile non-hemolytic reactions, anaphylactic reactions, simple allergic reactions, septic reactions due to bacterial contamination, transfusion-related acute lung injury (TRALI), and transfusion-associated circulatory overload (TACO).

REVIEW OF LITERATURE

Transfusion reactions can occur in approximately 1% of transfusions and can range in severity from mild to life-threatening events. The incidence of fatal reactions varies from 1 in 0.6 million to 2.3 million transfusions.

Acute Transfusion Reaction Incidence Per 100,000 units transfused.

Acute Hemolytic: 2-8

Anaphylactic -8

Septic – 0.03-3.3

TRALI- 0.4-1.0

Circulatory overload -10

Febrile nonhemolytic – 200(if leukoreduced);1000(if not leukoreduced)

Urticarial – 100

Delayed Transfusion Reaction Incidence Per 100,000 units transfused.

Delayed hemolytic transfusion reaction -40

Transfusion associated graft versus host disease (TA_GVHD) – very rare

Post transfusion purpura (PTP) – 1-2

OBJECTIVES

There are two objectives of this Study-

- To analyze the Rational use of blood and blood components during Blood Transfusion at Super specialty hospital of New Delhi, India
- To Study if there is irrational use, what is the reason behind it.

SECTION -2

RESEARCH METHODOLOGY

- **TYPE OF STUDY**

Observational and Quantitative study

- **STUDY AREA**

Multispecialty Hospital of New Delhi, India.

- **STUDY POPULATION**

Pts. from Cardio department, onco surgery department, nephron dialysis department. (January, February, March, April)

- **TYPE OF SAMPLING**

Convenience sampling

- **SAMPLE SIZE**

Total – 123

Nephro – 100

Cardio –16

Onco - 7

- **MODE OF DATA COLLECTION**

The data is collected from CPRS and Patient record file according to standard WHO checklist.

ABOUT CPRS.

The Computerized Patient Record System (CPRS) is a comprehensive electronic system that stores patient information. It integrates details about a patient's health, care, demographics, medical history, and financial information. This data is gathered from

various sources such as labs and billing services, providing a unified record for efficient healthcare management.

- **DURATION OF STUDY**

  2 months (22/4/2024-21/6/2024)

- **DATA ENTRY**- Manually
- **DATA ANALYSIS** - Using graphs, and Microsoft Excel.

SECTION -3

DATA ANALYSIS AND INTERPRETATION.

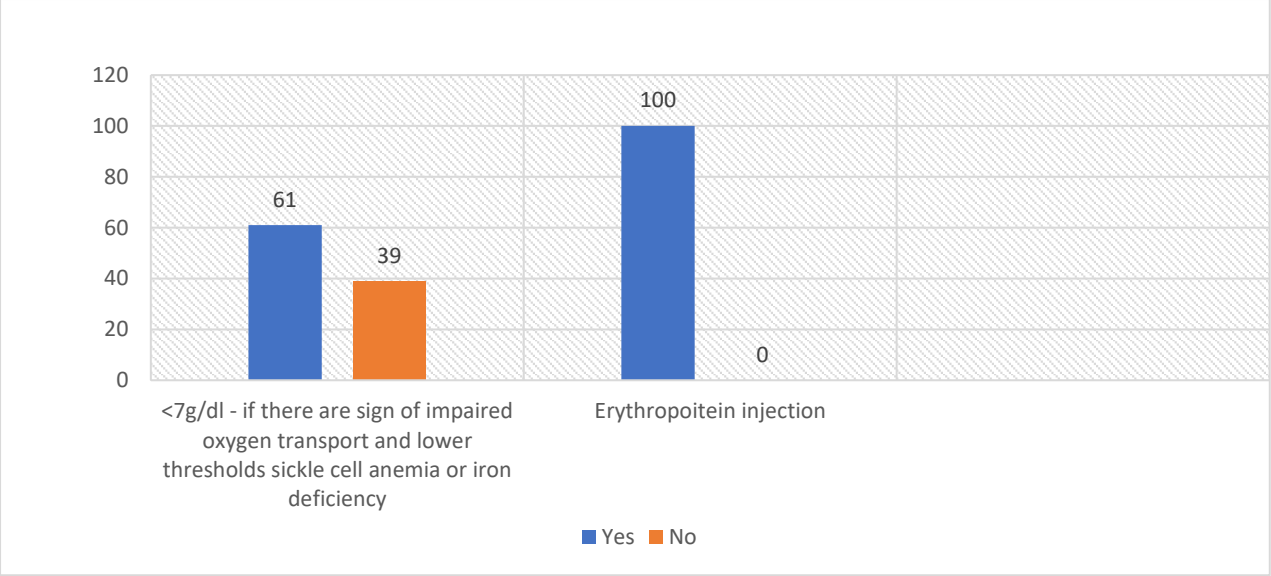

FIG. – Nephrology Department.

INTERPRETATIONS

- The total cases studied for the analysis in nephron department for Jan, Feb, Mar, Apr is 100.
- The Factors that are taken for analysis are-
  1. <7g/dl - if there are sign of impaired oxygen transport and lower thresholds sickle cell anaemia or iron deficiency
  2. Erythropoietin injection given.

- First bar represents that 61 pts (61%) have HB < 7 and 39 pts (39%) have > 7 out of 100 pts.

- Although ,in 39 pts (39%) the HB is > 7 ,but BT was administered due to the patient's multiple conditions like PR bleeding, severe iron deficiency anaemia, Renal anaemia, GI bleeding, hemorrhoids,UGI bleeding.
- Second bar represents that 100 % erythropoietin injections are given to all pts.
- Erythropoietin (EPO) is a growth factor synthesized by the kidneys that stimulates the production of red blood cells (RBCs).
- Despite administering 100% erythropoietin injections to all pts., low HB levels persist due to other underlying conditions. Therefore, prior to initiating dialysis, blood transfusion was administered.

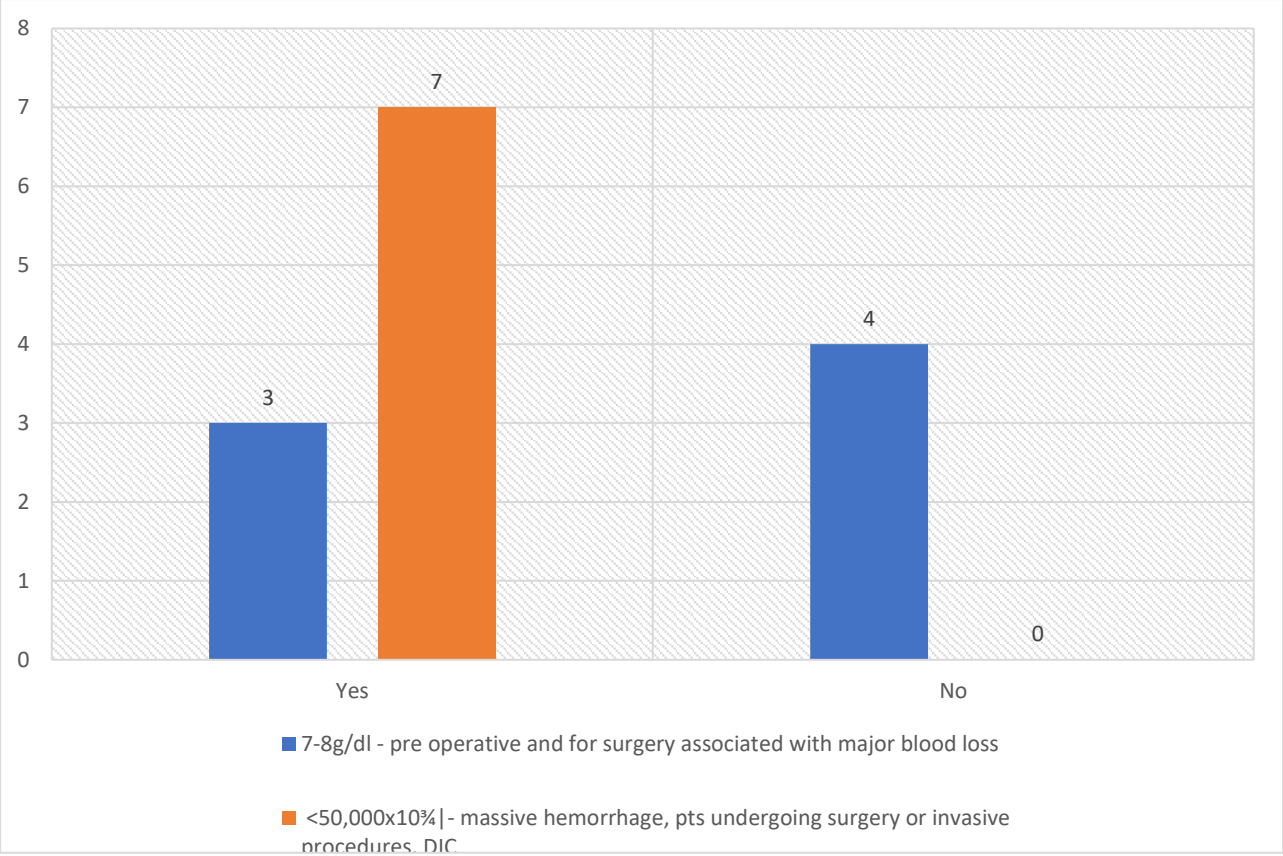

FIG : Oncology Surgery Department.

INTERPRETATION

- Out of 7 cases 3 cases(43%) had HB between 7-8g/dl pre- operatively .
- Out of 7 cases 4 cases (57%)had HB >8 pre-operatively but as the surgery is associated with major blood loss so BT was administered.
- All patient had Platelet count > 500000 pre-operatively.
- However the pt. had at a high risk of bleeding due to surgery so the BT was given despite of Platelet count.

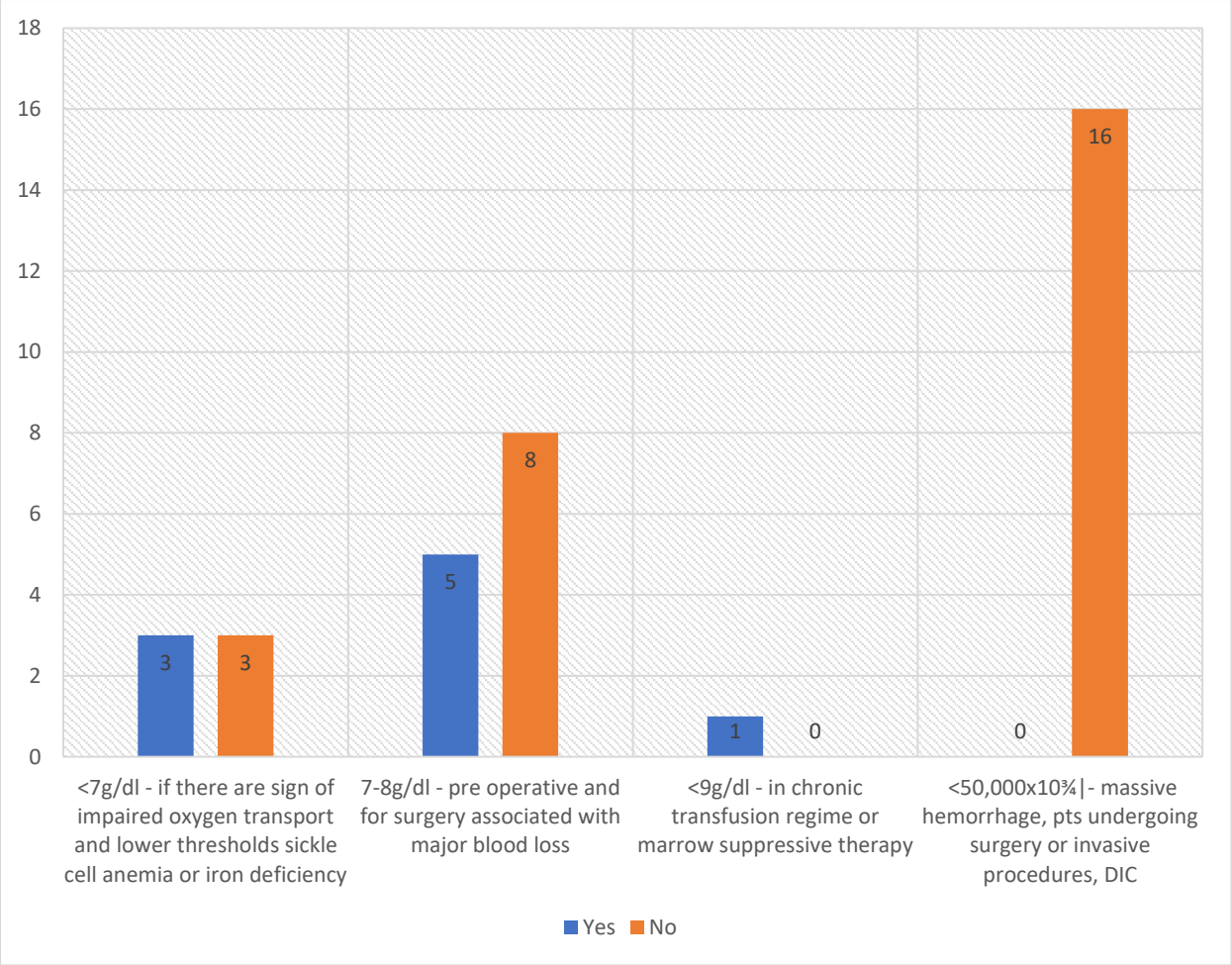

FIG- Cardiology Department.

- Out of 16 pts, 3 pts. (18%) had Hb <7g/dl and was suffering from iron deficiency anaemia, and 3 pts. (18%) had HB > 7g/dl but they were also suffering from iron deficiency anaemia, haemorrhoids, PR bleeding.
- Out of 16 cases 5 cases(31.2%) had HB between 7-8g/dl pre- operatively, and 8 pts.(50%) had HB >8g/dl pre-operative but there cases are highly associated with major blood loss , so BT was administered.
- Only 1 case out of 16 cases (6.25%)was suffering from Thalassemia minor and had HB <9g/dl so chronic transfusion regime was required.
- All patient had Platelet count > 500000 pre-operatively, but pts. were at a high risk of bleeding due to surgery so the BT was given despite of Platelet count.

SECTION-4

PROBLEM FACED

- The collection of data was not easy, there were no proper and systematic arrangement of notes especially for the Nephrology Dialysis department.

CONCLUSION

- In some cases, BT was administered beyond standard protocols, yet it was necessary due to pt's condition like surgeries associated with major blood loss, PR bleeding, hemorrhoids, severe renal anemia.
- Additionally, in instances where HB levels remained low even after erythropoietin administration, transfusion were provided prior to initiating dialysis to prevent patient collapse.
- So this study illustrates that the hospital practices rational utilization of blood and blood products, with ongoing monthly monitoring of all indicators using COM. (Clinical outcome measures)data.

REFERENCES

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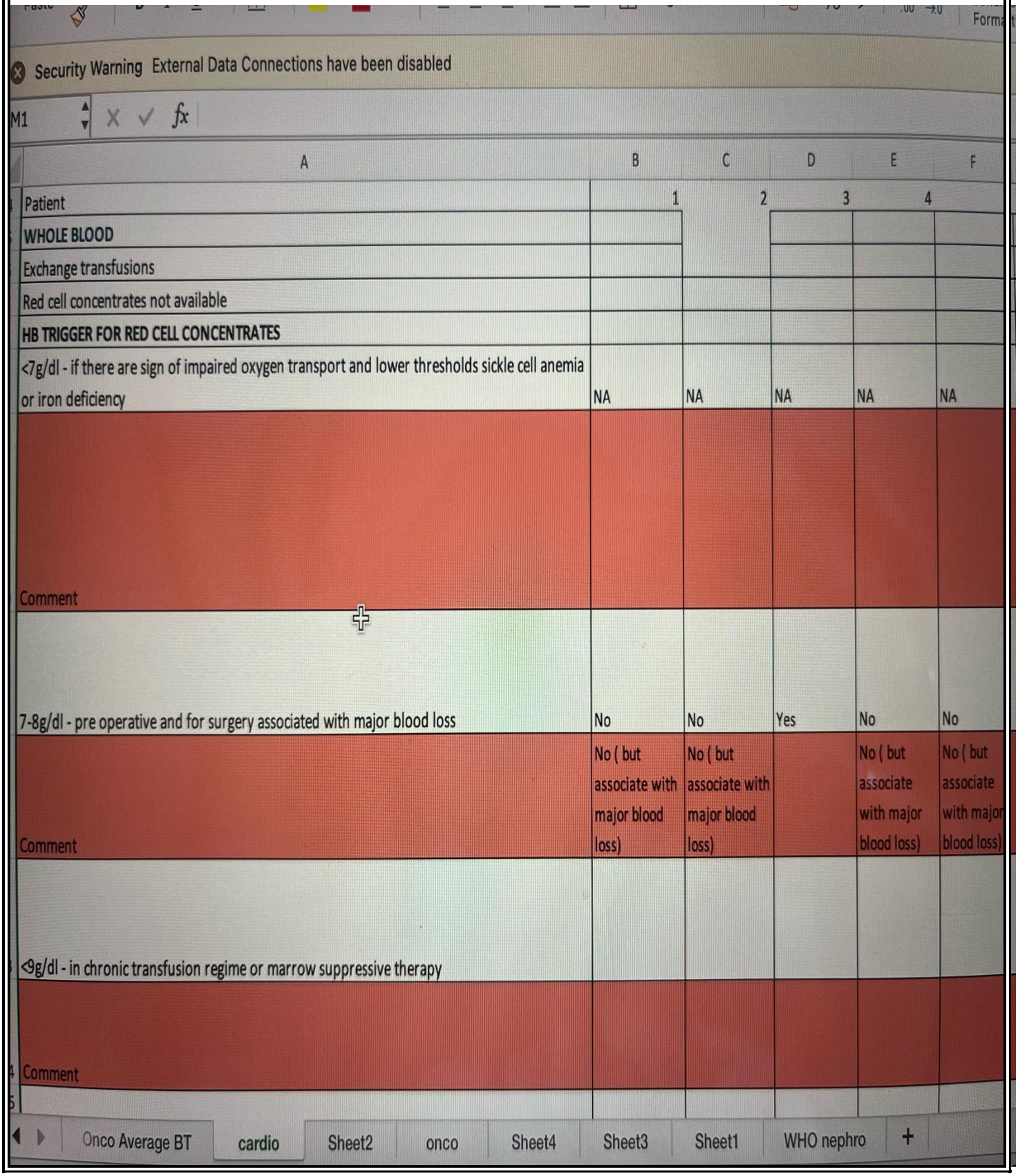
ANNEXURE:

S.NO	NAME OF DEPARTMENT.	INTERACTED WITH.	DESIGNATION.
1	OT.	DR. ATUL PETERS.	SR. SURGEON.
2	NEPHROLOGY DEPARTMENT.	MR. ARVIND	NURSING TEAM LEADER
3.	MICU	DR. RAJIV AGGARWAL	SR. CARDIOLOGIST
4	PHARMACEUTICAL DEPARTMENT	MR. VARUN	HEAD CLINICAL PHARMACIST.

ANNEXURE:

DATA COLLECTION FORMET IN EXCEL-



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M1

	A	B	C	D	E	F
	Patient	1	2	3	4	
	WHOLE BLOOD					
	Exchange transfusions					
	Red cell concentrates not available					
	HB TRIGGER FOR RED CELL CONCENTRATES					
	<7g/dl - if there are sign of impaired oxygen transport and lower thresholds sickle cell anemia or iron deficiency	NA	NA	NA	NA	NA
	Comment					
	7-8g/dl - pre operative and for surgery associated with major blood loss	No	No	Yes	No	No
	Comment	No (but associate with major blood loss)	No (but associate with major blood loss)		No (but associate with major blood loss)	No (but associate with major blood loss)
	<9g/dl - in chronic transfusion regime or marrow suppressive therapy					
	Comment					

Onco Average BT | cardio | Sheet2 | onco | Sheet4 | Sheet3 | Sheet1 | WHO nephro | +

MONTH	JAN	FEB	MAR	MAR	MAR	APR	APR
Patient	1	2	3	4	5	6	7
WHOLE BLOOD							
Exchange transfusions							
Red cell concentrates not available							
HB TRIGGER FOR RED CELL CONCENTRATES							
<7g/dl - if there are sign of impaired oxygen transport and lower thresholds sickle cell anemia or iron deficiency							
7-8g/dl - pre operative and for surgery associated with major blood loss	No	Yes	No	No	No	Yes	Yes
Comment	No (but associate with major blood loss)		No (but associate with major blood loss)	No (but associate with major blood loss)	No (but associate with major blood loss)	associated with major blood loss	associate with majo blood los
<9g/dl - in chronic transfusion regime or marrow suppressive therapy							
PLATLET COUNT TRIGGER FOR TRANSFUSION							
<10,000x10¾ul-as prophylaxis in bone marrow failure	NA	NA	NA	NA	NA		
<20,000x10¾l -BM failure with risk factors, fever, systemic hemostatic failure							
<50,000x10¾l - massive hemorrhage, pts undergoing surgery or invasive procedures, DIC	NO	NO	NO	NO	NO	NO	NO
	No (370)	75	155	150	175	155	

(Completion of Summer Internship from respective organization)
The certificate is awarded to

Name Dr. Renu Rathore.

In recognition of having successfully completed his/her
Internship in the department of

Title Medical Quality

and has successfully completed her Project on Title of the Project " Rational use of Blood & Blood components during Blood transfusion according to WHO criteria **Date** April 22 — June 21-2024)

Organisation Max Smart Super Speciality Hospital, Sake

He/she comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning

We wish him/her all the best for future endeavours

21/06/24

Organization Supervisor

Head-HR/Department Head

Max Smart Super Speciality Hospital
Mandir Marg, Press Enclave Road,
Saket, New Delhi-110 017

Certificate of Approval

The Summer Internship Project of titled "**Rational Use of Blood and Blood components during Blood Transfusion in a Multi speciality hospital of New Delhi"** at "**MAX SMART SUPER SPECIALITY HOSPITAL , SAKET, NEW DELHI** 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.

Name of the Mentor → Dr. Piyush Kanti Kha. :- Piyush

Designation - Assistant Professor.

IIHMR, Delhi

FEEDBACK FORM (Organization Supervisor)

Name of the Student: Dr. Renu Rathore.

Summer Internship Institution: Max Smart Super Specialty Hospital, Saket, New Delhi.

Area of Summer Internship: Medical Quality

Attendance: Punctual in conduct.

Objectives met:
She has completed all the tasks assigned during the internship.

Deliverables:
Blood transfusion Project.

Strengths:
Polite in conduct, Adaptable in team, Enthusiastic to take up new tasks, Sincere and quick learner.

Suggestions for Improvement:
Can work on improving self confidence while communicating with team.

Signature of the Officer-in-Charge (Internship)

Date: 21/06/24
Place: New Delhi

21/06/24.

FEEDBACK FORM (IIHMR MENTOR)

Name of the Student: DR. RENU RATHORE.

Summer Internship Institution: MAX SMART MULTI-SPECIALITY HOSPITAL ,SAKET,NEW DELHI

Area of Summer Internship: MEDICAL QUALITY MANAGEMENT.

Attendance: GOOD.

Objectives met: YES

Deliverables: MET.

Strengths: HARDWORKING, SINCERE, FOCUSED.

Suggestions for Improvement: KEEP LEARNING.

Signature of the Officer-in-Charge (Internship)

Date: 1 JULY 2024

Place: IIHMR DELHI.

Renu Rathore ST report

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