

***Residency Program
Doctor of Medicine (MD)
Curriculum (Phase-B)***

Transfusion Medicine



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1. Introduction:

1.1 Overview of the specialty

The specialty of Transfusion Medicine developed as sub specialization both physicians & surgeons for safe transfusion of blood & blood products as a part of their treatment. Now transfusion medicine is serving patients independently in wards. Serology is an important part of harmless transfusion. Safe donor recruitment & screening to prevent spread of serious diseases by transfusion. Some diseases like thalassaemia, haemophilia, aplastic anaemia etc are treated by blood & blood components only. More over, transfusion medicine requires knowledge in a variety of specialty like haematology, Microbiology, Immunology, Parasitology, Virology. It requires also appreciation of the importance of the epidemiology. It includes skilled laboratory science & clinical blood transfusion including management of hazards.

Donor recruitment is a community work. Increase of voluntary blood donor & replacement of party donation is an important subject in specialty. Haemovigilance is an important talk. Modern techniques like therapeutic & donor reducing apheretic technique is an important advance. Autologous transfusion as an alternative to homologous transfusion is gaining special attention. So, transfusion medicine is now recognised an important specialty in medical science.

1.2 Program Overview (Residency program in transfusion medicine)

The university has introduced residency program where training and education is based on knowledge, skill & attitude which require for clinical practice. It is a competency based program. Competency is attained by training under direct

supervision of teachers. 2 years phase A is completed on rotation in different allied specialty to improve broad range of core knowledge, skill & attitude. Core knowledge & skill acquired in phase A are further strengthened & refined during phase B training which is a 3 year specialty specific training.

2. Goals & objectives:

2.1 Goals: Ultimate goal is to make a competent transfusion medicine specialist

1. To prepare transfusionist who be able to meet and respond to the changing healthcare needs and expectation of the society.
2. To develop transfusionist who posses knowledge, skills and attitudes that will ensure that they are competent to practice transfusion medicine, safely and effectively.
3. To ensure that they have appropriate foundation for lifelong learning and further training in their specialty.
4. To help them develop to be critical thinkers and problem solvers when managing health problems in the community they serve.

2.2 Learning Objectives

Objective of the curriculum Phase B Transfusion Medicine M.D (Residency) is to attain competency in the field of transfusion medicine. The educational and learning process is to develop students to competent transfusionist. Who:

- Will address all aspects of appropriate transfusion need of a patient.
- Will be able to solve problem of transfusion medicine.
- Will be able to organize voluntary donor and donation camp in the country.

- Will be masters in leadership & team working.
- Will maintain highest standard of professionalism & will raise the prestige of transfusion medicine.
- Will be aware of current thinking about ethical & legal issues.
- Will be honest & responsible.
- Will manage time & resources for the benefit of profession, patient & colleagues.
- Will provide advance information technology to improve patient care.
- Will be competent to perform core investigation & procedures required in transfusion medicine.
- Will gather sufficient knowledge in research methodology will be able to identify educational need & attainment to these needs.
- Will be able to apply the knowledge of biological and behavioral Sciences in Clinical practice.
- Will be able to develop the skills of an effective teacher.

3. Admission Requirements for Phase B:

- A. Residents who has successfully completed Phase A training & passed Phase-A final examination are eligible for enrollment in Phase B.

4. Contents (syllabus) outline: Detail in section 11

The training in Phase B is designed to develop both generic & specialty- specific attributes necessary to practice independently as a transfusion medicine consultant to attain highest standard of service for patient with transfusion need. It also include the development of Positive attitude toward life long learning & ability to accept future technological advances & changing expectations of society.

4.1 Educational Program

4.1.1 Applied Basic Medical Sciences

- Applied basic medical sciences related to transfusion medicine with meaningful integration.

4.1.2 Transfusion Medicine Syllabus

- The syllabus include definition, epidemiology, etiopathogenesis, genetics, clinical presentation differential diagnosis, investigation, treatment especially by blood and component, prevention & prognosis of transfusion related haematological & other diseases.
- The trainee should be expert in laboratory diagnosis of all above diseases independently .
- They should learn recent advances & techniques used in transfusion medicine.
- They should learn about transfusion triggers & procedures of different transfusions.

4.1.3 Basic Courses on: (Optional)

- Research methodology
- Medical Education

4.2 Training Program

Phase B training rotations:

Transfusion Medicine Phase B training comprises rotations within Transfusion Medicine Specialty & other departments under control of transfusion medicine.

Transfusion –inpatient, out patient & emergency	12 months.
Donor motivation, recruitment, selection & making donor pool	3 months
Blood collection, processing & preservation	3 months
Component preparation, preservation & quality control	3 months
Screening of blood	3 months
Lab serology	6 months
Neonatal, paediatric and oncology transfusion	3 months
Eligibility assessment & preparation of final examination	3 months

5. Teaching & learning Process:

Competency outcome based model mending experiential learning; self directed study should be given importance. Teaching & learning should include several methods from formal lecture to planned practical & clinical skill & finally competency in the subject. The theoretical part of curriculum will include latest knowledge. This can be imparted using lectures, grand rounds, clinical meetings, morbidity/mortality review meetings, literature, review presentations, journal club self directed study, conference, seminars etc.

6. Records of training:

6.1 Log book:

- The day to day work done should be recorded in the log book & signed by supervising teacher daily.
- Log book should be supplied to residents at the 1st day of the training program.

6.2 Portfolio:

Resident will have to maintain a portfolio during the Phase B course. It will contain POMR, discharge, referral, procedure, case presentation, journal presentation. At the end of every block Port Folio will have to be evaluated.

7. Research:

Development of research competency forms an important part of the Residency Program curriculum as they are an essential set of skills for effective clinical practice. Undertaking research helps to develop critical thinking and the ability to review medical literature. Every Resident shall carry out work on an assigned research project under the guidance of a recognized supervisor; the project shall be written and submitted in the form of a Research/thesis report.

8. Assessment:

The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists for independent practice and lifelong learning and covers cognitive, psychomotor and affective domains. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum. Assessment includes both **Formative Assessment and Summative (Phase final) Examinations.**

8.1. Formative Assessment:

Formative assessment will be conducted throughout the training phases. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (Phase completion exams).

There will be Continuous (day-to-day) and Periodic type of formative assessment.

- **Continuous (day-to-day) formative assessment** in classroom and workplace settings provides guide to a resident's learning and a faculty's teaching / learning strategies to ensure formative lesson / training outcomes.
- **Periodic formative assessment** is quasi-formal and is directed to assessing the outcome of a **block placement** or **academic module completion**. It is held at the end of Block Placement and Academic Module Completion. The contents of such examinations include **Block Units** of the Training Curriculum and **Academic Module Units** of the Academic Curriculum.

8.1.1. End of Block Assessment (EBA):

End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, structured clinical Assessment (SCA), medical record review, and logbook assessment. Unsatisfactory block training must be satisfactorily completed to be eligible for phase final examination

8.1.2. Formative assessment for Academic modules for Biostatistics and Research Methodology and Medical Education to be done in the first nine months of Phase B training. Residents getting unsatisfactory grade must achieve satisfactory grade by appearing the re-evaluation examination to be eligible for the Phase B Final Examination.

8.2. Summative Examination:

Assessment will be done in two broad compartments.

- a) **Compartment A:** Consist of 3 (three) components.
1. Written Examination (Consisting of 2 papers).
 2. Clinical Examination (One long and four short cases).
 3. SCA and Oral (10 stations SCA, Oral one board consisting of 2 examiners).

Every Resident must pass all the 3 components of compartment-A separately. Candidates will be declared failed if he/she fails in one or more component (s) of the examination. He/she then have to appear all the 3 components in the next Phase B Final Examination.

- b) **Compartment B:** Thesis and Thesis defense.

8.2.1. Written Examination:

Two Papers: Contents of written papers listed in Annexure II

Question type and marks:

- Two Papers (Paper I and Paper II); 100 marks each; Time 3 hrs for each paper. Pass marks-60% of total of 2 papers.
- **Each paper will consist of Two Groups:**
- **Group A:**
 - 10 short questions (5 marks each)
 - These will assess the knowledge of different level and its application
- **Group B:**
 - 5 scenario based problem solving questions (10 marks for each).
 - The questions should focus to assess the capability of handling clinical problem independently and comprehensively as a specialist.
 - Suggested format:-
 - A scenario followed by question(s).
 - Questions may include diagnosis, differential diagnosis, investigation plan, treatment, follow up and patient education.

8.2.2 Clinical Examination: Long a short cases and Laboratory practical examination.**i. Long case: Marks-100**

- Directly observed.
- Two examiners for each examinee.
- History taking and examination by the examinee-30min.
- Discussion on the case- 20 min (Presentation-6min, crossing-6x2 min & decision-2min).

- Examiners will not ask any question nor stop the examinee in any way during history taking and physical examinations.
- Discussion should be done preferably as per structured format and proper weight age on different segments of clinical skills.

ii. Short cases: Marks-50

- Two in number.
- Time -20 min (equally divided for each case)
- Crossing should be done with proper weightage on different segment of clinical skills.

iii. Laboratory Practical examination: Marks-50

- Two Lab, Practical: Total Time – 2 hours.
- Two examiners for each candidate.
- Crossing 15min (with proper weightage on different segment of practical skills.)

iv) Pass Mars: 60% of Total of Long case, Short case and Practical.**8.2.3. Structured Clinical Assessment (SCA): Marks-100**

- 10 stations, 6 minutes each.

8.2.4. Oral Examination: Marks-100

- One board consisting of 2 examiners.
- 20 minutes (9+9+2)

8.2.5. Pass marks in SCA and Oral: 60% of total *SCA and Oral).**8.3. Thesis Evaluation:**

Marks: Thesis writing-200; Defense-100: Marks for acceptane-60% of total.

- To be evaluated by 3 (three) evaluators:- 2 subject specialists and one academician preferably involve in research and teaching research methodology.

- Among the subject specialists one should be external.
- Evaluators should be in the rank of Professor/Associate Professor.
- Supervisor will attend the defense as an observer and may interact only when requested by the evaluators.
- Thesis must be submitted to the controller of Exam not later than 27 months of enrolment in Phase-B.
- Thesis must be sent to the evaluators 2 (Two) weeks prior to assessment date.
- Evaluation will cover Thesis writing and its defense.
- For thesis writing evaluator will mark on its structure, content, flow, scientific value, cohesion, etc.
- For defense – Candidate is expected to defend, justify and relate the work and its findings.
- Assessment must be completed in next 3 months.
- Outcome of the assessment shall be in 4 categories – “Accepted”, “Accepted with minor correction”, “Accepted with major correction” and “Not Accepted”.

8.3.1. Description of terms:

Accepted: Assessors will sign the document and resident will bound it and submit to the Controller of Examinations by 10 days of the examination.

Accepted with minor correction: Minor correction shall include small inclusion/exclusion of section; identified missing references, correction of references and typographical and language problem. This should be corrected and submitted within 2 weeks.

Accepted with major correction: Task is completed as per protocol with acceptable method but some re-analysis of result and corresponding discussion are to be modified.

- To be corrected, confirmed by Supervisor and submit within 3 (Three) weeks.

- **Not Accepted:** When work is not done as per protocol or method was faulty or require further inclusion or confirmation of study.
- To complete the suggested deficiencies and reappear in defense examination during its next Phase Final Examination.
- Candidate has to submit his/her thesis and sit for examination and pay usual examination fess for the examination.

8.3.2. Residents must submit and appear Thesis defense at notified date and time. However non- acceptance of the Thesis does not bar the resident in appearing the written, clinical and oral exam.

8.4. Qualifying for MD/MS Degree:

On passing both the compartments, the candidate will be conferred the degree of MD/MS in the respective discipline. If any candidate fails in one compartment he/she will appear in that compartment only in the subsequent Phase-B exam.

9. Supervision & Training Monitoring:

Training should incorporate the principle of gradually increasing responsibility and provide each trainee with a sufficient scope, volume and variety of experience in a range of settings that include inpatients, outpatients, emergency and intensive care. All elements of work in training rotation must be supervised with the level of supervision varying depending on the experience of the trainee and clinical exposure. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases. As training progresses the trainee should have the opportunity for increasing autonomy,

consistent with safe and effective care for the patient. Trainee will at all times have a named Supervisor, responsible for overseeing their education.

Supervisors are responsible for supervision of learning throughout the program to ensure patient and/ or laboratory safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plans based on the curriculum, undertake appraisal, review progress against the curriculum, give feedback on both formative and summative assessments as well as sign the logbook and portfolio. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times.

The **course coordinator** of each department coordinates all training and academic activities of the program in collaboration with the **Course Manager**. The **Course Director** of each faculty directs guides and manages curriculum activities under his/her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisors.

10. Curriculum Implementation, Review & Updating:

Both Supervisors and Residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training program.

Since Transfusion Medicine has historically been rapidly changing specialty the need for review and up-dating of curricula is evident. The Curriculum is specifically designed to guide an educational process and will continue to be the subject of active redrafting, to reflect changes in both Transfusion Medicine and educational theory and practice Residents and Supervisors are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation at Residency Course Director Review will be time tabled to occur annually for any minor changes to the

curriculum. The Curriculum will be reviewed with input from the various subspecialties of Transfusion Medicine.

11. Detail content of learning (Phase B syllabus):

The educational process or syllabus of Phase B Transfusion Medicine M.D residency aims to provide basic knowledge, clinical skill to produce competent transfusionist. The residents will gather up to date knowledge, all available skills, will know future development. They shall recognize the health needs of the community & will carry out professional obligations ethically & keeping their standards by engaging in continuing medical education. The program also aims to introduce the candidate to the basics of scientific medical research.

PHASE B SYLLABUS

Knowledge:

- History of blood transfusion:
- Scientific landmarks in its development
- Impact of world war in its development
- Anticoagulants and preservatives.
- Modern blood banking.

Scientifics basis of transfusion medicine:

Antigen
Antibody
Antigen-antibody interaction
RBC – Hb structure & function, metabolic pathways, membrane structure & function.
WBC- structure, function & kinetics.
Platelet- structure, function & kinetics.

Genetics:

Principles of basic genetics
Genetics of blood groups.

- Phenotype & Genotype
- Principles of blood group inheritance
- Population genetics of blood groups.

Forensic application of transfusion genetics
Complement genetics and deficiency states.
Molecular genetics.

Major blood groups-ABO & Rh:

Genesis of ABO & Rh blood group Ag.
Genesis of Bombay Phenotype.
Clinical importance of major and minor blood groups.

Rh genotype & phenotype & clinical importance
Discrepancies of ABO & Rhesus blood groups and resolution
Importance of blood groups in clinical transfusion practice.
Different sub-group & their application in transfusion Medicine.

Minor blood groups:

Kell blood group.
Lewis system.
Duffy blood group system
Kidd blood group system
Diego system
MNSs system
Other minor blood groups & clinical importance.
Biological significance of minor antigens and antibodies.

Essential immunology for transfusion medicine:

Principles of basic immunology

- Antigen, antibodies, complement
- Immunoglobulin
- Antigen antibody reaction

Cellular & Humoral immune response.
Complement system, their use and importance in transfusion medicine.
Cell mediated immunity in transfusion medicine.
Lectins and polyagglutinability
Role of hybridoma technology in transfusion medicines
Polyclonal & monoclonal antibodies and their use.
Immunology of transplantation.
HLA and genetic control of immune response.
Autoimmunity and Hypersensitivity.

Haematology:

Erythropoiesis.

Pathophysiology, diagnosis and management of anaemia.

Iron deficiency anemia

Megaloblastic anemia

Aplastic anemia

Anemia of chronic disease.

Neonatal anemia.

Thalassaemia

Sickle cell anemia

Enzyme & membrane defect

Myelofibrosis.

Polycythaemia.

Haemoglobinopathies.

Haemolytic anaemias.

Sideroblastic anemia.

Nutritional anemia.

Hemophilia

Von Willebrand disease

Platelet disorders: Qualitative & Quantitative.

Disseminated intravascular coagulation (DIC)

Lymphoproliferative disorders including Hodgkin's and non-Hodgkin's Lymphoma.

Acute and chronic leukemias: diagnosis and management.

Human leucocyte antigens:

HLA class I & II genes.

Expression of class I & II genes

Distribution of HLA molecules.

Genetics & inheritance of HLA genes.

Function of HLA molecules.

HLA antibodies.

Detection of HLA antibodies.

Clinical relevance of HLA Ags & Abs.

HLA & disease.

HLA in transplantation & transfusion.

Human platelet antigens & antibodies:

Nomenclature, inheritance, structure.

Detection of Platelet alloantibodies.

Neonatal alloimmune thrombocytopenia.

Platelet cross-match.

HLA matched platelets.

Refractoriness.

Human Neutrophil antigens:

Nomenclature.

Detection of neutrophil antibodies.

Clinical signification of HNA & Abs.

Neonatal alloimmune neutropenia.

NHFTR, TRALI & ARDs.

Autoimmune neutropenia.

Physiology of Hemostasis:

Role of Platelet.

Coagulation path ways.

Fibrinolysis.

Coagulation study.

Coagulation problem in anesthesiology & intensive care.

Pre-transfusion testing:

Compatibility testing:

- ABO grouping & Rh typing.
- Antibody screening.
- Cross-matching methods.
- Newer methods of cross-matching
- Solid phase
- Gel technology.
- Microplate technology
- Electronic cross-match.

Screening for Transfusion Transmitted infections:

- Methodology
- Screening of HIV, HCV, HBV, Syphilis & malaria as per rules
- Nucleic acid amplification techniques (NAT)
- Western blot techniques.
- Confirmatory testing of HIV, HCV, HBV & others virus
- Polymerase chain reaction (PCR)
- DNA analysis
- Newer emerging pathogens
- Cjd disease
- Lyme disease
- Others.

Blood Transfusion and Immunohaematology:

Autoimmune haemolytic anaemia (cold).

Autoimmune haemolytic anaemia (Warm).

Classification, diagnosis & management.

- Immune Haemolytic anaemia.
- Immune thrombocytopenia.
- Immune neutropenia.

Drug induced immune haemolytic anaemia.

Mechanism of immune destruction of red cells.

Pathophysiology, diagnosis and transfusion support in acute blood loss:

- Shock
- Hemorrhage
- Massive transfusion
- Rapid transfusion
- Multiple transfusion

Transfusion support in surgery:

General surgery

Gynecological surgery

Specialized surgery

- Cardiopulmonary
- During anaesthesia
- Other specialized surgery.

Classification diagnosis & transfusion support in oncology:

Haemopoietic malignancy

Non-haemopoietic malignancy.

Classification, pathophysiology, diagnosis and transfusion support:

- Thalassaemia
- Hemophilia
- Aplastic anaemia
- Leukemia
- Sickle cell disorder
- Patient receiving post-surgery chemotherapy.

- Cancer patient receiving chemotherapy.
- Triggers for transfusion: Whole Blood, RBC, Platelet, FFP, Cryoprecipitate, Plasma.

Antenatal and neonatal transfusion practice:

Pathophysiology, diagnosis & management.

- Feto-Maternal incompatibility- Rh & ABO
- Use of immunoglobulin

Exchange transfusion

- Indication, methodology & complication

Neonatal transfusion practice

- Strategies to reduce donor exposure
- Organized donor selection
- Intra-uterine transfusion.

Antenatal and Neonatal transfusion of

- Red blood cells
- Platelet
- Fresh Frozen Plasma (FFP)
- Cryoprecipitate
- Stem cells
- Cytokines.

Adverse effect of blood transfusion:

Haemolytic transfusion reaction

- Clinical Presentation
- Pathophysiology
- Investigation
- Management

Non Haemolytic transfusion reaction

- NHFTR

Allegry, Urticaria, Anaphylaxis.

- Clinical Presentation, Pathophysiology, Investigation, prophylaxis & Management.

TrALI, ARDS Air Embolism

- Investigation & Management.

Transfusion associated graft versus host disease

Transfusion transmitted infections:

- Bacterial
- Viral
- Parasitic

Bacterial infection in stored blood.

- Investigation & Management.

Iron overload

- Investigation
- Chelation.

Blood Substitutes and Haemopoietic agents:

Crystalloids & colloids.

Oxygen carrying agents

Alternatives to transfusion therapy

Use of haematinics

Haemopoietic growth factors

Plasma products

Cytokines

Interleukins

Immunoglobulin.

Transfusion in Transplantation:

Transfusion support in transplantation

Stem cell transplantation.

- Harvesting

- Cryopreservation
 - CD34 counting & quality control
- Bone marrow transplantation
- Harvesting
 - Processing.
 - Immunohaematological problems in ABO mismatched Bone marrow transplantation.
- Transfusion support in specialized conditions.
- Renal transplantation
 - Liver transplantation
 - Other solid organ transplantation
- Irradiation of blood products
- Indication dose & adverse effects.

Special banking protocol:

- Tissue banking
- Cord blood banking
- Bone banking
- Organ banking.

Organization and management of transfusion services:

Organization of blood transfusion services and hospital transfusion practice
Establishment of blood transfusion centre
Development of transfusion service.
Blood donor issue in disaster management
Donor recruitment and motivation.
Operation of blood mobile
Inventory control & stock control
Contingency plan in transfusion medicine.
Development of forms, labels records etc.
Procurement of equipments, instruments, furniture, reagents, kits, blood bag, blood transfusion set & other consumable in transfusion medicine.

Quality Management in Blood Transfusion Services:

Development of Standard Operating Procedures (SOPs) manual.

Development of quality policy, quality plan & quality manual

Quality control

- Reagents & diagnostic kits
- Instruments
- Personnel
- Blood & blood components

Quality assurance

- Internal quality control
- External quality control.

Quality assessment scheme

- Internal quality control
- External quality control.

Assessment of quality of error management

Validation & calibration of equipments

Hospital Transfusion Committee

Transfusion Audit & Haemovigilance.

Good manufacturing practice (GMP) & certification in Transfusion Medicine.

Bio-safety in Blood Transfusion Services:

Personnel

Laboratory

Equipment

Sterilization

Disposal of waste material

Universal Safety Precaution.

Infection prevention.

Monitoring of transfusion services:

Periodic monitoring of administrative & managerial activities of transfusion services.

Periodic quality control of all tests of a transfusion service
Proficiency testing of laboratory personal
Continuing Medical Education (CME) program for new batch reagent, test kits and others.
Continuing Medical Education (CME) program for newly recruited staff and others.
Data analysis and feedback for national database & future plan.

Modern biological approach in Transfusion Medicine:

Principle, method & application in Transfusion Medicine.

- Gene therapy
- Cloning of red cell genes
- Recombinant technology
- Generation of recombinant vaccines

Role of Intravenous Immunoglobulin in treatment of disease

Artificial blood & blood substitutes.

Robotics in serology

Enzyme in blood group serology

Complement I genetics & complement 11 activation & inhibition.

Progress in blood group serology.

Future trends in transfusion medicine.

Transfusion practice and patient management:

Assessment of blood needed in a hospital or a country.

Principles of blood volume replacement therapy.

Code of Ethics for blood donation & transfusion.

National Blood policy for well-organization of blood transfusion services.

Development of communication skill including information technology among patient's, patient's relatives and doctors to contribute efficiently in a team for patient management.

Transfusion practice and patient management.

Patient management in Day care Ward & out-patient department.

Appropriate, rational & clinical use of blood and blood components.

Plastic bag technology.

Biochemical changes of stored blood.

International aspects of blood transfusion service:

World health organization (WHO): Policies & issue.

International Society of Blood Transfusion (ISBT): Policies & issue.

League of Red Cross & Red Crescent Societies: Policies & issue.

World Federation Hemophilia: Policies & issue.

International Federation of Thalassemia: Policies & issue.

South Asian Association of Transfusion Medicine (SAATM): Policies & issue.

Indian Society of Blood Transfusion & Immunohaematology (ISBTI): Policies & issue.

National aspect of blood transfusion service:

National Safe Blood Transfusion Council: Policies & issue.

National Safe Blood Transfusion Expert Committee: Policies & issue.

National Voluntary Blood Donor Committee: Policies & issue.

Hospital Transfusion Committee: Policies & issue.

Hospital Voluntary Blood Donor Committee: Policies & issue.

Blood Transfusion Society of Bangladesh (BTSB): Policies & issue.

Organization & management of blood transfusion services:

Industrialized countries

Socialist countries

Developing countries.

Economically depressed countries.

Media and voluntary blood donation movement:

Role of Press in voluntary blood donation.

Role of Cinema in voluntary blood donation.

Role of Theatre in voluntary blood donation.

Role of Television & radio in voluntary blood donation.

Role of IEC material in voluntary blood donation.

Skill (Clinical):

General Physical Examination

- History taking examination of patient, interpretation of investigation, differential diagnosis, Diagnosis, Treatment, referral, death review of patient in ward/ daycare.

- Emergency management.

• **Blood donor:**

Donor recruitment & selection criteria.

Voluntary versus relative donation.

Use of information technology for donor recruitment.

Donor information Program.

Self deferral.

Donor care/ Pre-donation, Mid donation and Post donation.

Donor reaction, Prevention and management of reaction.

Donor motivation & counseling.

• **Blood collection:**

Anticoagulants and blood preservatives.

Procedures of blood collection.

Cryopreservation of RBC, Platelet.

Storage of component and whole blood.

Blood donation camps.

• **Component & Derivatives:**

Preparation of components.

Leucodepletion.

Irradiation

Viral Deactivation

• **Determination of Transfusion Triggers: RBC, Platelet, FFP, Cryo.**

• **Practical Transfusion:**

Transfusion procedures.

Transfusion of RBC.

Transfusion of WBC.

Transfusion of Platelet & refractoriness.

Transfusion FFP & cryo & factor.

- Assessment and management of complication:

- Autologous transfusion.

- Transfusion in marrow & stem cell transplantation.

- Transfusion in solid organ transplantation.

- Exchange Transfusion.

- Intrauterine transfusion.

- Transfusion in pregnancy & labour.

- Transfusion in severe anaemia.

- Transfusion in aplastine anaemia.

- Transfusion in chemotherapy.

- Transfusion in open heart surgery.

- Organization of blood collection Program.

Neonatal & Paediatric Transfusion:

- Transfusion of RBC in neonate and adult.
- Transfusion of WBC in neonate and adult.
- Transfusion of Platelet in neonate and adult.
- Transfusion of FFP, Cryo, Factor in neonate and adult.
- Methodology complication management of exchange transfusion.
- Organization of blood collection Program.
- Letting of blood.
- Stem cell transplantation.
- Preparation of grouping sera, anti humanglobin sera & evaluation.
- Preparation of blood preservative.
- Study of markers of TTI.
- Transfusion in haematological diseases
- Transfusion in Chemotherapy patient.
- Transfusion in Transplantation.
- Learning new technologist.
- Exchange transfusion.
- Apheresis.
- Hemovigilence.

Skill (Laboratory):

- Blood grouping ABO, Rh, Genotype, Phenotype, new technologies.
- To meet discrepancy of grouping.
- Cross match- Routine, coombs` matching and Emergency matching.
- Meet up of discrepancy in cross matching & provide compatible blood for patient.

- Supply of incompatible blood in special situations.
- Supply of phenotype specific blood.
- Diagnosis of stained blood/ marrow film.
- Klauher's test.
- Ham's test.
- Coombs` test- Direct & indirect.
- Alloantibody detection, identification & titration.
- Autoantibody detection & titration.
- Elution of ab, Adsorption of Ab.
- Specification of Ab-use of panel cell.
- Preparation of Panel cell & preservation.
- Haemolysin test.
- Preparation of solutions.
- Reading & recording of haemagglutination.
- Investigation of transfusion reactions.
- Secreter study.
- Biochemical study of stored components.
- Screening of blood.
- Paternity study
- HLA typing.

Annexure 1:

Block 1						
Months	1st	2nd	3rd	4th	5th	6 th
Educational Program	Scientific basis of transfusion medicine, Applied anatomy and physiology, Genetics. Basic Courses: Biostatistics, Research Methodology, Basics of Medical Education.					E O B A
Clinical Training Rotations	Inpatient, outpatient, Emergency					
Thesis work	Protocol development/Submission/IRB clearance					

Block 2						
Months	7th	8th	9th	10th	11th	12th
Educational Program						E O B A
Clinical Training Rotations	Donor motivation, Recruitment, selection, making donor pool, blood collection, processing and preservation,					
Thesis work	Patient enrolment, intervention and data collection					

Block 3						
Months	13th	14th	15th	16th	17th	18th
Educational Program						E O B A
Clinical Training Rotations	Component preparation, Preservation, quality control, Screening of Blood.					
Thesis work	Patient enrolment, intervention and data collection					

Block 4						
Months	19th	20th	21st	22nd	23rd	24th
Educational Program						E O B A
Clinical Training Rotations	Inpatient, outpatient and Emergency,					
Thesis work	Patient enrolment, intervention and data collection					

Block 5						
Months	25th	26th	27th	28th	29th	30th
Educational Program						E O B A
Clinical Training Rotations	Lab serology					
Thesis work	Patient enrolment, intervention and data collection					

Block 6							
Months	31st	32nd	33rd		34th	35th	36th
Educational Program				E O B A	Eligibility Assessment and Phase B Final Examination		
Clinical Training Rotations	Neonatal, paediatric and oncology transfusion						
Thesis work	Report writing and submission.						

Annexure 2:

CONTENTS OF WRITTEN PAPERS

Paper-I (Blood group and serology)

1. Scientific- Basis of transfusion medicine
2. Genetics
3. Major blood groups.
4. Minor blood groups.
5. Immuno-Haematology.
6. Hereditary Haematological disorders
7. Haemostatic disorders.
8. Human leucocytes, Platelet, Neutrophil and serum antigens.
9. Pre-transfusion testing
10. Organization and management of transfusion services.
11. Quality management and bio-safety.
12. Antibody detection, identification and titration.
13. Meet up of discrepancy in grouping & cross matching
14. To provide compatible blood.
15. Coombs' test.
16. Secretor study.
17. Paternity study.
18. Klauher's test, Ham's test.

Paper-II (Clinical blood transfusion)

1. Donor selection, Blood collection, processing and preservation.
2. Screening of blood and components.
3. Component preparation & preservation
4. Haemolytic disease of New born.
5. Blood transfusion in surgery
6. Blood transfusion in Oncology.
7. Paediatric Blood transfusion.
8. Blood transfusion in stem cell and bone marrow transplantation.
9. Transfusion in solid organ transplantation

10. Blood transfusion in cardiac surgery
11. Antenatal and neonatal transfusion practices.
12. Transfusion in hereditary haemolytic anaemia.
13. Transfusion in coagulation disorders.
14. Reaction of transfusion.
15. Transfusion in severe anaemia.
16. Blood substitutes.
17. Transfusion triggers.
18. Instrumentation in blood transfusion.
19. Intrauterine transfusion.
20. Autologous transfusion, aphaeresis, exchange transfusion.