

DIPLOMA IN BLOOD BANK TECHNOLOGY 1ST YEAR

MICROBIOLOGY AND BIOCHEMISTRY

1. Introduction to microbiology, fundamental of microscopy, sterilization and disinfection
2. Classification of micro organisms and their staining techniques,
3. Bacteriological media, pure cultures and cultural characteristics, bacteria of medical importance
4. Transfusion transmitted infections, HIV, HCV, HBV malaria syphilis
5. Elisa rapid and other tests for diagnosis of transfusion transmitted infections
6. Personal and laboratory bio safety, management of biomedical waste and viral inactivation
7. Instrumentation principles: ph meter colorimeter spectrophotometer, electrophoresis equipment
8. Bile salt, bile pigment and iron metabolism

HEMATOLOGY

1. Normal erythropoietin, leucopoiesis, formation and function of platelets
2. Classification of anemia, their laboratory diagnosis hemoglobinopathy: beta thalassemia and sickle cells diseases G6PD deficiency, polycythemia
3. Autoimmune hemolytic anemia, classification diagnosis specificity of auto antibodies.
4. Coagulation mechanism, homeostasis, laboratory tests for coagulation, platelet disorders
5. Hematological malignancies
6. Bone marrow transplantation, peripheral stem cells cord blood banking
7. Collection of blood samples types of anticoagulants
8. Complete hemogram, different methods of hematology analysis sahil's cyanmethemoglobin and hemocue method red cell indices

GENERAL IMMUNOLOGY

1. Principle of basic immunology, history, immunity
2. Antigens: immunogenic allo- antigen, soluble, antigen, red cell antigen epitopes
3. Antibodies: polyclonal antibodies, development of antibodies, structure of immunoglobulin's characteristic of immunoglobulinism
4. Monoclonal antibodies: hybridism technology, human monoclonal antibodies application of M ab.
5. Antigen antibody reaction antigen concentration , enhancing media other factors influencing antigen antibody reaction immunoassays ELISA
6. Cells of immune system: phagocyte cells, antigen presenting cells, t-cells, subsets b-cells,
7. Autoimmune disorder
8. Complement system
9. HLA antigen HLA antibodies HLA serology, histocompatibility matching, molecular methods
10. Molecular methods in immunology
11. Immunology of transplantation
12. Genetics of blood groups and their classification basics

BLOOD DONATION AND BLOOD COMPONENTS

1. Selection of blood bags for component preparation, preparation of red cells concentrate, fresh frozen plasma, platelet concentrate, cryoprecipitate, washed red cells and frozen red cells.
2. Plasma fractionation principles manufacturing of different plasma derivations
3. Types and method of preparation of component testing labeling storage and quality control
4. Storage and transportations of blood components
5. Preparation of leukoreduced blood products leukocyte filter principle of component extractors

6. Metabolic changes in blood components during and storage release of cytokine during storage
7. Inventory management and maintenance of blood stock
8. Irradiated blood components
9. Blood substitute
10. Measurement of factored vlll level in FFP
11. Measurement of fibrinogen level FFP
12. Sterility test on whole blood and platelet concentrates
13. Measurement of pH and other platelet concentrates.
14. Preparation of cryoprecipitate, peripheral blood skim cell
15. Donor motivation motivational techniques, social marketing, preparation of IEC materials
16. Donor recruitment and retention management to blood donation type of blood donor selection medical interview and medical examination screening for hemoglobin estimation, managing deffred blood donors, techniques for conversion of first time donor in to regular voluntary donor, donor felicitation
17. Blood collection room equipment their principle and use emergency medicine pre donation counseling, bleeding of the donor post donation care and counseling
18. Screening of blood units for mandatory test, decoration of infected unites
19. Blood donation driver: awareness programs prior to blood donation drive, visit of comp site, staff requirement, management of camp transportation of blood units from camp site to blood bank
20. Preservation of donated blood preservation solution addition solution
21. Aphaeresis procedures products preparation of multiple products on cell separators maintenance of cell separators equipment
22. Antilogous blood donation

DIPLOMA IN BLOOD BANK TECHNOLOGY 2nd YEAR

TRANSFUSION THERAPY

1. Criteria for acceptance of requisition from management of blood bank
issue counter inspection of blood component prior to issues
2. Blood transfusion, transfusion filters post transfusion care, therapeutic plasma exchange
3. Judicious use of blood management of different type of anemia
management patient neonatal transfusion practices in surgery
transfusion therapy for oncology and transfusion patients
4. Tat physiology, diagnosis and management of hemolytic disorder
5. Hemolytic and delayed immune and non immune reaction patho-
physiology clinical signs and HTR test defect bacterial contamination in
blood
6. Non hemolytic transfusion reactions immediate and delayed febrile
reaction allergenic reaction clinical signs and symptoms
7. Acute transfusion lung injury alloimmunization iron overload graft
versus host diseases
8. Strategies to prevent transfusion reaction

IMMUNOHAEMATOLOGY

1. Basic principle of immunohaematology application of blood groups,
population genetics forensic medicine transfusion medicine
2. ABO blood group system: history genetics ABH antigens, biochemical
synthesis of blood group antigens, antigenic sites, weaker variants ,
Bombay group phenotype, ABO antibodies .
3. Rh blood group system: history geneticist molecular genetics nature of
Rh antigen, partial D weed D other variants of Rh, Rh null Rh antibodies
factors influencing Rh immunization, functional – role of Rh antigens
4. Other blood group system: lewis P, Li MNSs kell duffy , celano in private
antigens public antigens

5. Antenatal serology hemolytic diseases of the new born due to ABO incompatibility Rh incompatibility and other allo- antibodies
6. Red cell serology techniques their advantages and disadvantages cell and serum grouping detection of weak A and b cases trouble shooting in red cell serology
7. Pre transfusion testing, different method of cross matching cross matching in special circumstances emergency cross matching electronic cross matching
8. Principles of direct and indirect antiglobin test enzymes technique. Albumins techniques detection of blood group antibodies identification of their specify clinical significance of antibody detection, differentiation between auto and allo - antibodies

QUALITY CONTROL IN BLOOD BANKING AND LEGAL ASPECTS

1. Quality control of blood grouping reagents QC of anti human globing reagent bovine albumin, normal saline
2. Quality control of blood bags
3. Quality control of different blood bank compoents sterility test on component
4. Automation in blood banking
5. Calibration validation and maintain of blood bank equipment QC of blood bank techniques internal and external QC
6. Organization of blood bank services blood bank premises and infrastructure regional blood transfusion centre and blood storage center blood bank management system
7. Record keeping and reporting haemovigilence
8. Regulations for blood bank operations drugs and cosmetics law, national blood policy standard in blood banking licensing procedures
9. Requirement and training of blood bank personal proficiency testing
10. Blood bank accreditation
11. Ethical and legal consideration pertaining to transfusion practices identification of blood stains fraternity testing donor notification and

consoling look back programmed drugs and cosmetics act accreditation
consumer protection act and others.

**RECENT ADVANCES AND MODERN BIOLOGICAL TECHNIQUES IN
BLOOD BANKING**

1. Automation and computerization use of bar code
2. Auto blood group and processing
3. Automated infections screening nucleic acid testing western blot
polymerase chain reaction (SSCCP, SSOP) dot blot hybridization
apheresis stem cell in blood banking
4. Principle methods relevance in transfusion medicine
5. Blood substitutes
6. Glycerolisation to preserve RBCs
7. EQUAS samples and their report