PT. B.D.SHARMA UNIVERSITYY OF HEALTH SCIENCES, ROHTAK

HOSPITAL MANUAL

INFORMATION PROVIDED BY ALL THE DEPARMENTS

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PT.BHAGWAT DAYAL SHARMA POST GRADUATE INSTITUTE OF MEDICAL SCIENCES, ROHTAK (HARYANA)

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FOREWORD

PT. Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak (PGIMS) comprising of main hospital, Ch. Ranbir Singh OPD Complex, Trauma Care Centre, Mother & Child Hospital and the super specialty centers is dedicated to state of the art patient care, research and medical education in the Haryana. The hospital services are the most visible component of the Institute services to the nation, because of the definitive cure, care and relief of pain and suffering of the patients.

The faculty, resident doctors, staff nurses and paramedics are the strength of the hospital services. The Hospital Manual of the Institute offers broad guidelines for reference by the Doctors, staff and patients who are new to the PGIMS community and it has been compiled with the contribution from various departments. There had been a long felt need to prepare this manual by providing a comprehensive source of information to the patients which shall help in their smooth initiation to the institutes' procedures.

Besides it also shall serve a useful referral source for different department's faculty, Resident Doctors, Nurses and other staff members both directly and indirectly related with patient care, in a multi-disciplinary setting. The compilation of this manual would not have been possible without the valuable contributions from the faculty of various departments who helped in giving it a conclusive shape. Given the enormous range of services available in PGIMS, it was not an easy task to assimilate all that is relevant to users in a single source of information. We may have overlooked some facts, which we hope the users will bring to our notice, and shall be incorporated in future edition.

The guidance provided under the Chairmanship of Prof. O.P. Kalra, Vice Chancellor is gratefully acknowledged. He has been a constant source of inspiration for bringing out the best. I am thankful to Dr H.K.Aggarwal Registrar UHS and Dr Rohtash Yadav Director PGIMS for their help in bringing out this manual. The intention in this work is modest; we hope it will help Doctors & Staff during their induction and later in serving years.

(**Dr. M.G.Vashist)**

MESSAGES

Prof. (Dr.) O.P.Kalra

Vice Chancellor, UHS, Rohtak

MESSAGE

Director

PGIMS, Rohtak

HOSPITAL MANUAL PT.B.D. SHARMA PGIMS, ROHTAK

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INTRODUCTION TO PGIMS, ROHTAK

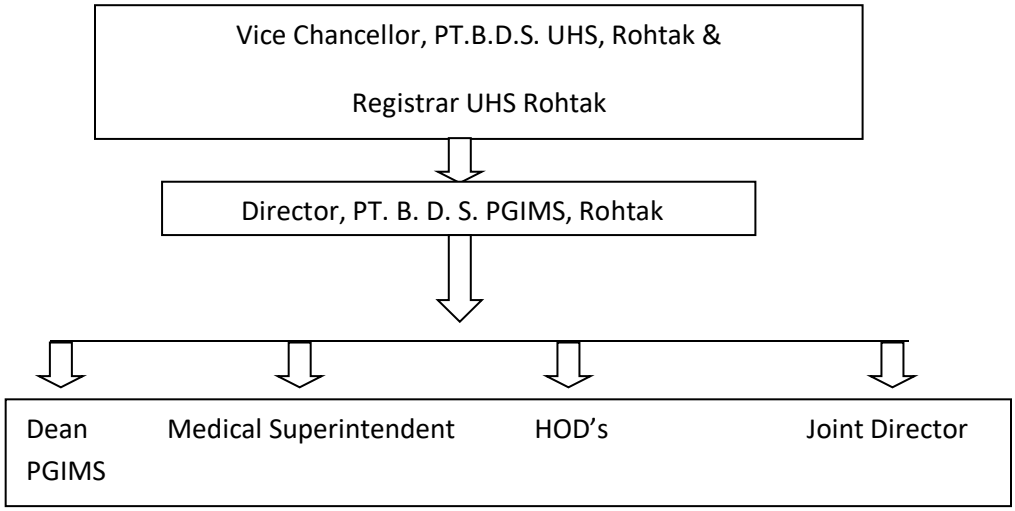
HOSPITAL LAYOUT

Pt. B. D. Sharma, PGIMS, Rohtak is situated at a distance of about 240 km from Chandigarh and about 70 km from Delhi on Delhi-Hisar-Sirsa-Fazilka National Highway (NH-10). As one enters the PGIMS hospital from the main road through Chhatra Marg, a big four storied building on the left side is housing the OPD Complex and is named after Ch. Ranbir Singh. Thereafter around 0.5 km on Vidyasagr road, there is Accident and Emergency department and there is a small Central Admission and Enquiry Office and a cash counter. The block just behind it is the Blood bank and main hospital building. On left of Vidyasagar road, just in from to Accident & Emergency department is the Post Graduate Institute of Dental Sciences. Just adjoining to it is the Psychiatry department and on left side of Vidyasagar road is the Lala Shyam Lal Super specialty block having different super specialty departments. Just on the side of superspeciality block is the Dhanwantri Trauma Centre which provides trauma services round the clock and orthopedic and surgical emergencies are treated in the trauma centre.

INTRODUCTION TO PGIMS, ROHTAK

It is a major Institution for Medical Education and Research and a tertiary care centre for provision of specialized health care services not only to the people of the State of Haryana, but also to those from Punjab, Rajasthan, Delhi and western U.P. The Institute is named after the first Chief Minister of Haryana Pandit Bhagwat Dayal Sharma. The Institute was started under the name of Medical College, Rohtak in the year 1960. For the first three years, the students were admitted to Medical College, Patiala which acted as a host Institution. In 1963, the students were shifted to Rohtak. In the subsequent years, multifaceted expansion measures have transformed the Institute into a fully developed center of Medical Education and research in all the major disciplines of Medicine. In the year 1994, Medical College, Rohtak was renamed as Pt. B.D.Sharma, Medical College, Rohtak and subsequently it was upgraded to a Post Graduate Institute of Medical Sciences in the year 1995. Today Pt. B.D.Sharma, PGIMS, Rohtak is a renowned institution not only for medical education but also for the health care facilities both at the National as well as International level.

ORGANISATIONAL STRUCTURE OF INSTITUTE



ADMINISTRATIVE CONTROL

Administratively the PGIMS hospital is under the control of the Medical Superintendent (MS) (Int. Tel 2252 Direct 281311) under supervision of Director PGIMS. For the purposes of administrative assistance in the different areas of the hospital services, separate Officers-in-charge/ Dy. Medical Superintendents have been designated from the Deptt of Hospital Administration and other departments.

PATIENT CARE SERVICES AVAILABLE AT THE PGIMS HOSPITAL

The patient care services available at the PGIMS hospital are of two types. One is the care of the patients in general disciplines like General Medicine, Surgery, Pediatrics, Obstetrics and Gynecology, Orthopedics, Otorhinolaryngology, Opthalmology, Dental Surgery, Dermatology and Venereology and Psychiatry etc, which run general OPD's as well as speciality clinics. The teaching programme in these departments lead to award of postgraduate degrees like MS and MD. The second category is the care of patients by 'Superspeciality disciplines' (like Cardiothoracic Sciences, Endocrinology, Gastroenterology, Neurosciences, Pediatric Surgery, Urology and Nephrology etc.) which provide specialized patient care mostly to the referred patients. The teaching programme in most of these specialties lead to award of super specialization degrees like DM and MCh. For acutely ill patients and patients with any kind of medical or surgical emergency there is provision of round the clock casualty and emergency services. The Institute has comprehensive facility for teaching, research and

patient care. PGIMS, Rohtak conducts teaching programmes in medical and para-medical courses both at undergraduate and postgraduate levels. The PGIMS hospital and specialty centers caters to nearly 1681075 patients in Out Door Department and 105045 patients in Indoor departments of the hospital at different centres. On an average around 186748 surgical procedures are being conducted in a year.

Main Hospital Building:-

The main hospital building is spread over 3 floors in different wards. The patient who require admission to different disciplines are admitted in main hospital.

Lala Shyam Lal Superspeciality Building:-

The patients who need super speciality care are admitted in Lala Shyam Lal Superspeciality Building housing various super specialities like Cardiology, Cardiac surgery, Neurology and Neurosurgery, Burn and Plastic surgery and Nephrology.

Regional Instiute of Opthalmology:-

The patients suffering from ophthalmic ailments go to Regional Institute of Ophthalmology located in Main Hospital Building.

Regional Institute of Cancer:-

Similarly, the patients suffering from cancer ailments go to Regional Institute of Cancer. The centre is located near the Labor Room and Microbiology department. The outdoor and indoor facility are provided under single roof.

Dhanwantri Trauma Center and Medical Emergency Department:-

The Hospital is also providing round the clock emergency services from Dhanwantri Trauma Center and Emergency Department. The Dhanwantri Trauma Center is a newly commissioned center and is situated adjacent to the Lal Shyam Lal Superspeciality Building. The Trauma Center is dedicated for the round the clock treatment of trauma emergencies. The Trauma Center has its separate Reception Counter and OPD registration counter. It is spread over four stories and has five Main Emergency Operation Theatres and 21 bedded Intensive Care Unit. In addition the Trauma Center have all diagnostic facilities like digital X Ray machines, CT Scan/ MRI scan Machines, Ultrasonography etc. The Trauma is manned by the Resident doctors from the department of General Surgery, Orthopedics

and allied surgical departments. The General Duty Medical Offcier is also present round the clock and involed in Medcio legal work. The Trauma has proper triage facility and centrailsed medical gas pipe line system. The medical emergencies are attended in the Medical Emergency department located in the Old Hospital Building. The Emergency department is amnned by the doctors from the department of Medicien, Paediatrics, Chest and TB. In addition one Casualty Medical Offcier is also present round the clock for helping in medciolegal cases and in smooth management of emergency services. The Emergency department is also having 12 bedded Intensive Care Unit for treatment of sick patients. The Emergency department is having its separate computerized registration counter. The patients attended in Ch. Ranbir Singh OPD, Dhanwantri Trauma Center and Emergency department are registered with a token amount of Rs 5/- per patient. This amount is also waived off for poor patients. The Emergecy department and Dhanwantri Trauma Center has its own Drug Distribution Counters and emergency laboratories. The Emergency department is located near the Blood Bank and the Dhanwantri Trauma Center has inhouse Blood Collection Center. The patients are admitted either through Outpatient Departments (OPDs) or though Trauma centre, Medical Emergency department or Labor Room.

OUTPATIENT DEPARTMENT (OPD)

Location: Ch. Ranbir Singh OPD Block

The institute is having State of the Art modern Out Door Patient Department in a separate Centrally Airconditioned Building named after Ch. Ranbir Singh an eminent Freedom Fighter and member of Constituetnt Assembly who prepared the Constitution of India. The OPD department is very spacious and is spread over four stories. The OPD building is having facility of different speciality and superspeciality OPD clinics. The different departments also run various special clinics for providing specialized services in a particular subspeciality like Geriatric Clinic, Nephrology Clinic, Pain Clinic etc. The OPD is having decentralized facility of OPD registration. The Ch. Ranbir Singh OPD is also having facility of Drug Distribution Counters. There are around 24 different drug distribution counters for providing free drugs to all patients. The OPD is also having facility of sample collection and all laboratory investigation facilities. The OPD building is also having facility of Minor Operation Theatres associated with surgical and allied departments OPDs for minor surgical procedures on day care/ OPD basis. The provision of diagnostic facility like Digital X- Ray machines is also available in the OPD Building. In addition there is facility of round the clock CT scan and MRI scan on Public Private Parternship basis. The patients can have their CT/ MRI scans from this facility at much cheaper rates.

REGISTRATION

A patient becomes eligible for obtaining medical help of this hospital only after getting himself/herself registered. There is decentralized registration system i.e. each OPD has its own decentralized computerized registration counter. The patients have to pay Rs. 5/- for obtaining the stamped registration card. The patient is then directed to a particular consultant room to be seen by the doctor. The Hospital Management Information System (HMIS) is implemented at OPD registration counters and patients are issued unique UHID numbers.

FUNCTIONING

The patients treated in the OPD are usually ambulatory and with minor ailments or referred cases from outside. Acutely ill patients must not be referred to the outpatient department. They must be managed in the casualty or Trauma Centre.

In the OPD, a short clinical work up is done and documented on the OPD card. The OPD card is for the patients. It must include a clearly written provisional or definitive diagnosis as well as the advice and treatment given to the patient. A list of investigations planned may also be written on the card for convenience of the patients. Patients are given correctly and completely filled in investigation forms. These forms must clearly show the area of origin (i.e. MOPD, SOPD etc), unit, the name of the patient, registration number, diagnosis and the signature as well as the name of the doctor who has filled in the forms. Unless care is taken in filling up the forms correctly the reports may get lost. The laboratories have instructions not to accept incorrectly filled in forms. It must be explained to the patients that for all the OPD investigations (e.g. blood, urine and stool) there is a Centralized Sample Collection Centre on the ground floor and third floor of OPD, patient should present himself/herself at this area with the investigation forms on any working day between 9.00 a.m. to 2.00 PM. The reports of the investigations will automatically reach the respective outpatient departments. This will be possible only if the forms are correctly filled. For X-rays related to Orthopedics department the patients have to report to the X-ray counter on the ground floor of OPD. For X ray of other specialties and super specialties, the patients have to report to Main Radiology department. There are digital X ray facilities in both OPD complex and Main Radiology department.In case of an emergency arising in the OPD, the sister-in-charge has been provided with the necessary first-aid, drugs and equipment. After the first aid has been given, it is advisable to shift the patient to the casualty department or Trauma centre immediately.

To make things easy for the patients, it is advisable to fix a definite date for the next appointment which should be written down on the OPD cards.

REFERRALS FROM OUT-PATIENT DEPARTMENT

For obtaining the opinion of other specialties, the exact problem for which the patient is being

referred must be written down on the OPD card and the patient should be directed to the relevant OPD. Usually there is no need for re-registration of the patient in the outpatient department where he or she is being referred. However, if the patient is to be transferred to the other specialty then a new registration number of that OPD will be necessary, but without any payment.

Important: While referring the patient to any other speciality in OPD, please make sure that the result of the investigations done and the list of investigations requested accompany the patient. This will save repetition of the investigations, your time, your colleague's time and laboratory's time, and will also save further inconvenience to the patient.

SUPER SPECIALITY CLINICS

Most of the super specialty clinics are also held in the Ch. Ranbir Singh outpatient department. Their main purpose is to treat patients with similar diseases, the best possible ambulatory care which a super specialist can give. The reference to these clinics comes from two sources. Firstly, patients seen in general OPD, having an obvious problem belonging to a super specialty, may be referred to these clinics for further follow up and management. Secondly, at the time of their discharge from our hospital the in-patients may be asked to report to a super specialty clinic for follow up treatment. The registration for these clinics is done on the floors where the clinics are held.

A. ADMISSION PROCEDURES

For general wards

Patient needing admission to the wards for further management can be admitted from the OPD directly.

The HOD/ consultant Incharge of the general discipline units are in-charge of admissions. Admitting Senior Resident will fill in an "admission form" for use of the Central Reception. The patient should be instructed to present the form to the clerk at the Central Reception.

The Central Reception directs the patient to the ward where he or she is to be admitted. Sister-in-charge provides the bed to the patient on presentation of the admission papers.

The patient has to deposit Rs. 10/- before he or she can be admitted. This charge can be waived off by the authorities to patients covered under exempted categories.

Being an acute care hospital with limited bed strength, only acutely ill patients are admitted in the general wards. However, occasionally a relatively less acutely ill patient is also admitted for investigations and diagnostic work up.

INLETS FOR GENERAL WARD ADMISSIONS

(a) Patient seen in general OPD, who are sick enough or have a diagnostic problem needing detailed investigations, are admitted directly.

(b) Patients seen in super specialty clinics, being run under the purview of general disciplines, needing admission may also be admitted in general wards under the unit-on-call for that day of the week.

(c) Patients presenting in the medical casualty with acute and serious illness needing hospitalization can also be admitted in general wards.

(d) Patients presenting in Dhanwantri Trauma Center with trauma needing hospitilizaion can also be admitted in a general wards.

(e) The pregnant ladies reporting in Labor Room are also admitted in a general ward.

WHEN AND WHOM NOT TO ADMIT

(a) Patients who can be treated and/or investigated at the OPD level as ambulatory patients should not be admitted.

(b) Ambulatory patients, who are being followed up in clinics run by super specialty departments, are not admitted in general wards.

(c) As a rule, irrespective of the general medical or surgical unit which may have seen the patient on his or her first visit, the patient needing admission due to acute problem on a particular day is admitted under the unit-on-emergency for that day of the week. Such an acutely ill patient should not be referred to the unit which saw the patient on his/her first visit and is not on emergency duty for that particular day.

Admission Procedure for the Emergency Wards*:* There are beds provided in Emergency department and Dhanwantri Trauma Center for emergency admission only from casualty. The consultant or Senior Resident of the unit-on emergency decides on the admission. The resident doctor fills in the admission form and directs the patient to the Central reception for admission, as described above. Respective departments should shift their patient from emergency wards within 24 hours. It is the responsibility of the unit (to whom the patient belongs) to transfer the case back to their own ward at the earliest so that admission of other units does not suffer the next day.

Surgical and Orthopaedic emergencies are treated in Trauma Centre. Patients directly report to Trauma centre and there registration is also done in Trauma Centre. Patients requiring admission are admitted under respective speciality in the trauma centre and later on shifted to concerned departments after the emergency is tackled. Patients requiring ICU care are shifted to Trauma ICU.

Admission procedure for the private ward: Generally, Private Ward's admissions are "Elective" admissions of patients, who can afford to pay the charges. A consultant advises the admission of the patient to the private wards and a prescribed form is filled by the admitting consultant. These patients

have to deposit advance amount of Rs 5000/- along with admission fee of Rs 180/- with the cashier and the private room is allotted to the patient on first come basis. The patients are also charged room rent as per the category of rooms along with charge of Rs 180/- per day in lieu of diet provided by the hospital and Rs 20/- for doctor round.

The detail of Government employee and private patients entitlment for private ward accommodation is as under:-

FOR GOVT. SERVANTS/PENSIONER/PRIVATE PATIENTS:

Sr. No.	Type of Rooms in Private Ward (Special Ward)	For Govt. Servants (Basic Pay)		For Govt. Pensioners (Basic Pension)		For Private Patients	
		Existing	Revised	Existing	Revised	Existing	Revised
1.	Ordinary Room without AC	21000	54000	10500	27000	20000	25000
2.	A.C. Room	25530	66000	12675	33000	25000	30000
3.	(Private Ward-24 R. No. 101 to 104)	34198	88000	17099	44000	35000	40000

The employees of Pt. B.D. Sharma, University of Health Sciences, Rohtak & Haryana Govt. Servant who are not entitled for special ward in respective category and if they are interested in taking Private wards/in other category, they will have to pay the applicable charges. The Officer In charge of Private Ward tries its best to admit the patient on the admission day of a particular unit but sometimes it may not be possible.

B. ADMISSION OF THE PATIENTS TO THE SUPERSPECIAITY DEPARTMENTS

Separate beds are available for the super specialty departments (e.g. Gastroenterology, Pediatric Surgery, Nephrology, Urology etc.) and they admit directly on their beds. There are 3 inlets for admission to these wards.

1. From the super specialty clinics: Patients seen in the super specialty clinics run by the super specialty departments may be advised admission to their wards directly. The formalities of admission are the same as described above.
2. From the Casualty: Occasionally a patient seen for the first time in the casualty may have an illness which make him more suitable for admission and care by a super specialty department. The CMO on duty in consultation with the Senior Resident of the general discipline, call the Senior Resident of the super specialty department who may admit the patient directly under his care.
3. Ward Transfers: Occasionally a patient may be admitted to general wards and later due to the special type of care required due to patient's illness, he or she may be transferred to the super specialty wards, in this case, the bed has to be provided by the concerned super specialty.

2

WARD MANAGEMENT

FUNCTIONING OF THE WARDS

After the patient is advised admission by the treating doctors through one of these routes and have to follow the following tasks. The attendants of the patient or the patient himself has to report in Central Admission and enquiry section to complete the formalities for the admission and deposit the admission fee. The patient is also issued gate pass for visit of their attendant. In Inddor area, one attendant is allowed with each patient. After this exercise, the patient reaches the ward and is admitted over the allotted bed in the ward. The primary function of patient care lies with the doctors ranging from the consultants (faculty) to the senior and junior residents. The support services are the responsibility of the nursing and other paramedical staff. The bed of the patient is prepared by the nursing staff. The junior residents in the ward now work out the case and discuss with the senior residents. After the final consultation with the consultant, the patient is advised investigations and treatment in the ward is commenced. The treatment of the patient is started as per instructions of consultant/senior resident, which is duly noted down in the patient case sheet for compliance. All treatment orders should be mentioned clearly both in case sheet and instruction book along with date, time and without any ambiguity, by the Resident on duty. Telephonic/ verbal instructions to the nursing staff should be strictly avoided but under unavoidable circumstances, should be followed by written instructions as well. All routine investigations are done in morning hours and investigation forms for the same are filled the previous night by doctor on duty and handed over to night nurse so that she gets ready for collection of various samples by procuring necessary bottles etc. Blood samples are to be drawn by doctor on duty before going off duty. Routine procedures and dressing for ward patients are to be done preferably in morning hours following the rounds with consultant as maximum number of staff is available during morning hours. While in the ward, the patient is looked after by the faculty members and senior and junior residents also besides the other staff. The some of the departments also have house surgeons and the interns to share duties. In the ward, the sister

incharge of the ward is responsible for the duty roster, equipment maintenance, records, infection control, inservice training, smooth functioning and maintaining liaison for all other activities. These include allocation of work to nurses, supervision of their clinical work, supervision of group-D staff, stores and laundry. The remaining nursing staff performs their duties relating to direct and indirect patient care on rotation in three shifts. The Group–D employees include bearers and sanitary attendants. They are deployed in shift duties in the wards and besides direct and indirect patient care, they are also involved in housekeeping, maintaining the supplies and equipment, taking patients for special investigations and transporting the samples and specimens to reach the concerned laboratories at right time. The patient admitted in the ward is the responsibility of the hospital, so not only the departments or wards but also the number of in-house utility and support services have to work constantly for the benefit and comfort of the patient and his stay in the hospital. The patient is advised different laboratory and radiological investigations which are carried out in different laboratories of different disciplines, at different places in the hospital. Laundry services work continuously for providing clean and washed linen in the wards. CSSD performs two major functions for hospital wards, that is sterilization and packing of trays, packets, drums and different sets used for different procedures in the ward. Blood bank supplies the required blood and its components to the patients after doing a battery of tests on the blood received from the donors. The wards in the hospital also have continuous supply of medical and therapeutic gases and vacuum provided through central pipeline from the Gas Manifold room. Diet in the wards is supplied through the Dietary Services Department which not only provides the normal diet to the patients but also different therapeutic diet, like low salt, diabetic, renal, high protein, high carbohydrate diet, liquid diet etc. The hospital sanitation is looked after by sanitation department which is meant for the maintenance of cleanliness in the hospital premises. This department is headed by a I/c MPHS and has a number of group-D employees.

The patients, once admitted receive all these facilities almost free of cost, except for the nominal fee of Rs.10/- at the time of admission. No fee on account of routine investigations is charged form the patients except for special radiological investigations for which a nominal fees has to be paid. Most drugs and consumables are available in wards and a ‘Drug Formulary’ containing a list of medicines available in hospital stores is present at the nursing station. As far as possible, medicines may be prescribed from this drug formulary only and a minimal number of prescription slips be given to patients for purchase from outside. In case of non-available medicines for poor patients, local purchase may be done on recommendation by consultant and assessment of economic status of patients by treating doctor. This should be done in working hours as hospital stores and offices are open.

The Department of Hospital Administration, M.S. Office, Hospital Stores, Launday, Billing Section and Hospital Security Services are all contributing towards the welfare of the patients admitted in the hospital.

PATIENTS ATTENDANTS & VISITING HOURS

In general wards, one attendant is allowed to stay per patient. However, attendants are not allowed to stay in Intensive Care unit, treatment rooms, operation theatres and recovery room. At the time of Consultant round, the attendants should leave the ward and wait in waiting area. However, in the pediatrics age group one relative/mother is permitted to stay during the rounds.

PATIENT – DOCTOR COMMUNICATION

After the consultant's round patients or their relatives must be informed about the patient's condition and plan of action decided by treating doctors in a language understood by the patients. Consent must be obtained prior to any procedures and should be informed and written. A daily update of patients' condition in all ICU's must be given to their relatives, since relatives are not allowed inside ICU. A Resident on duty must be available in the ward or doctor's duty room round the clock.

DISCHARGE SLIP

This contains the complete, precise and accurate summary of the patients hospital medical record and is given to the patient at the time of discharge. Discharge Summary is the only official document given to the patient. Therefore, it must truly reflect the highest standards of medical care being given to the patients in this hospital. In no case should the case sheet be handed over to the patient as it is the property of the Hospital. It must be accurate and concise and should include all details of patient like Name, age, sex, CR. number, ward, bed no., Department and Unit. & complete diagnosis in block letters. A summary of investigation should be included and in case of X-ray, biopsy, ECG, reference number must be included. The date, time and place/identity of clinic/OPD where the patient has to report for follow up must be included clearly. The advice on discharge must be clear and explained to patient in a language easy to understand by him/her. The discharge slip should be seen and signed by the concerned senior resident.

3

WORK UP AND MANAGEMENT OF INDOOR PATIENTS

CASE SHEET MAINTENANCE

Case sheet is an important document for patient care, medical records and medico legal purposes. Case sheet is the property of the hospital. It has to be maintained properly. The final responsibility for the case sheet upkeep is that of Resident Doctor of treating unit and after discharge of the patient it must be deposited in Medical Record Department within 48 hours. The Senior Resident, Consultants and Head of the Unit must ensure the timely deposition of the case sheets in the MRD office.

MANAGEMENT OF INDOOR PATIENTS

For the purpose of management of indoor patients beds are generally divided among the Junior Residents for the purpose of treatment and monitoring under the direct supervision of the Consultant and Senior Resident. Consultant/ Senior Resident is responsible for overall supervision of all patients.

BED SIDE PROCEDURES

Usually the following bed-side procedures are carried out on the patients in the wards: pleural tap, ascetic tap, lumbar puncture, bone marrow aspiration and biopsy, liver biopsy, liver abscess aspiration, kidney biopsy, lung biopsy, pleural biopsy, skin biopsy, venous cut down etc. While performing these procedures, the following guidelines will be of help to the Residents and Interns.

1. All procedures have to be proceeded by explaining the procedure in clear and simple language to the patients and his/her relative, along with the patient's risks if any involved in it. Consent has to be obtained in writing on the proper consent form available with sister positively before proceeding for the procedure.

2. Procedures should be planned neither late in the evening nor on holiday unless it is an emergency, because more staff is available for management.

3. For some procedures, patients have to be "nil-orally" for 4-6 hours preceding the procedure. Procedure should be planned in such a way that patient does not have to wait for longer hours than is necessary.

4. The surgical instruments required for such procedure are available in Central Sterile Supply Department (CSSD) on demand. Notice must be given 24 hours prior to procedure to the Sister Incharge, so that she can arrange the same from CSSD. Even in emergency it should be assured that the correct instruments are available before patient is prepared for the procedure.

5. For most of the biopsy tissues, aspirated fluids, etc. special containers are needed. These should be correctly labelled and material dispatched immediately to the concerned laboratory. Most laboratories have fixed hours for receiving samples. It is therefore necessary to plan the procedure in such a way that all samples can be sent the same day.

6. An emergency tray containing drugs necessary for resuscitation is available in every ward. This emergency tray must be kept at the bedside while performing these procedures.

PREPARATION OF ANAESTHESIA AND POST OPERATIVE INSTRUCTIONS

Pre-Anesthesia Clinic

The Department of Anesthesia runs "Pre-Anesthesia Clinic". It is held on ground floor in Ch. Ranbir Singh OPD complex. It is run by consultant Anesthetist with the help of their Resident doctors. The patients requiring surgery under any kind of Anesthesia should be referred to this clinic after doing necessary investigations.

Post-Operative Instructions

After surgery, it is the duty of the operating unit to write clear cut post operative instructions to be followed by the nursing staff. These should include details of any particular position that the patient is to be nursed in. It should also include instructions regarding oral intake, intravenous fluids (type of fluid and amount), management of various indwelling tubes like Ryle's tube, chest and abdominal tubes, Foley's catheter and any other tubes. The antibiotics to be administered should be clearly written along with the dosage and route of administration. The pain killers should also be written clearly as far as their name, dosage and route of administration is concerned. The resident writing the

post operative instruction must put his initials and full name underneath. The date and time should also be mentioned clearly.

DISCHARGE AND FOLLOW SLIP

For the convenience of patient, it is suggested that patients be informed about their contemplated discharge at least 24 hours in advance. It is advisable to get clearance from other consulting units if they have been monitoring the patient closely. Discharge should be planned in a way that the patient leaves the bed in morning. This facilitates patients' transport to their residence and also allows new patients admitted from OPD to occupy bed without inconvenience. Private Ward patients may also be discharged by 12:00 noon or patients have to pay charges for that day also. Sister Incharge Private Ward should also be informed of discharge of paying patients well in advance to enable her to clear bills in time.

4

DEPARTMENT OF ANAESTHESIOLOGY

A. Distribution of Department into units: Single Unit

B. Detail of faculty: Sr. Prof. 6
Professor: 8
Assoc Professor: 4
Assistant Professor: 32

C. Detail of OPD/OT/Ward days :

a) OPD: i) Pre Anaesthetic Clinic - 120 average daily patient.
ii) Pain Clinic: 30-50 average daily patient

b) O.T.: i) Elective OTs: Mon to Sat
ii) Emergency OT: Daily
iii) Trauma OT: Daily
iv) MCH OT: Daily

c) Intensive Care Unit:
i) RICU: 24*7
ii) TICU: 24*7

d) Specialized Remote Location:

i) Electro-convulsive Therepy (ECT) 15-20 pts per day (three times in a week).
ii) Radio diagnosis –MRI 4-5 pts (once in a week)
iii) Others- CT & Radiotherepy, Anaesthesia / MAC services for Thoracoscopic/ Bronchoscopic procedures by chest & TB Deptt. & PCCM Deptt.

D. Services provided by the department including special clinics and SOPs followed in OPD consultation, admission , treatment and discharge and discharge of patients run by the department with days :

i) PAC : 120 average patient daily.
ii) Special clinic: Pain clinic: All types of chronic pain patients are managed including fluoroscopic and ultrasound guided advanced interventional pain treatment procedure, Radiofrequency, platelets rich plasma and the like.
iii) Elective operations theatres (All Surgical Speciality) : Anaesthesia to regular 16 OTs : for general surgery, Orthopaedics, paedics, burn & plastic, Onco, Obst & gynae, Eye, ENT, Uro/ Neuro & CTVS OTs) : Approx 50-60 pts per day
iv) Emergency operation Theatres : 1 tables (24 hours * 7 days) approx3-4 pts/day
v) Emergency Labour Room Operation Theatre (MCH OT) :3 tables (24 hours * 7 days) approx. 15 pts/day.
vi) Trauma OT: 5 OT (24 *7) approx. 20-25 pts/ day
vii) RICU : 8 bedded respiratory Intensive Care Unit for critical ill patients with 90-100% bed occupancy
viii) Trauma ICU : 20 beded (24*7) care of critically ill patient
ix) Remote Location Anaesthesia Service:

- Electro-convulsive Therepy (ECT) approx.. 15-20 pts per day (three times in a week)
  Radio diagnosis –MRI approx 4-5 pts (once in a week)

Others- CT & Radiotherepy, Anaesthesia / MAC services for Thoracoscopic/ Bronchoscopic procedures by chest & TB Deptt.& PCCM Deptt.

E. Duties of consultant, Senior Residents and Junior Residenets: Rotational posting in all areas of Anaesthesia coverage including:
PAC
Pain Clinic
Elective OT (All Surgical Speciality)
Emergency OT
Emergency OT Labour room (MCH OT)
Trauma OT
RICU
TICU

Remote Location Anaesthesia Service:

- Electro-convulsive Therepy (ECT)
- Radio diagnosis –MRI
- Others- CT & Radiotherepy

F. Responsibility of Emergency care and elective care including emergency operations and elective surgeries: Rotational posting of faculty, SR and PG in all OT (Elective & Emergency) and ICU : RICU & TICU. Rotation Roster is sent to MS office every month.

- Anaesthesia Technician are posted in all elective OT and Trauma OT.

G. Detail of UG and PG teaching programme:
UG Teaching: According to MCI curriculum
Theory lectures 20 for final year MBBS part 1
15 days clinical posting for final year MBBS part 2
15 days interns posting
Batch of MBBS final year students of 15 in number for 15 days.
3 batches of B.Sc. OT technology in Anaesthesia (4 to 6 students per batch)
PG Teaching: Daily 8 -9 AM, seminars, case discussion, journal club, lectures
3 batches of Post- graduate MD students of 36 each
2 batches of post – graduate Diploma students of 8 each

H. Detail of hospital rounds by the faculty: Pre- Anaesthetic Care round is done by consultant for their respective surgical list.
ICU round taken by the consultant posted in the ICU
Emergency consultant takes the round of emergency OT in the evening hours on their respective emergency days.

I Any other information/ service provided by the department:
Faculty Members: Regularly participate in various zonal, national, international, conferences & workshops for presentation, deliberation talk, chairing session, as judge and panelist.
Students: Regularly participate in the conference for poster and oral presentation, debates & quiz competition and win prizes. The theory & practical classes for each category of students is taken by faculty members and residents of the department.
Department / Institute development activities: The faculty members are part of various committees looking after institute development, well fare activities.

5

DEPARTMENT OF ANATOMY

A. Distribution of Department into Unit:- One Unit Only

B. Details of Faculty

- Dr. S K Rathee
- Dr. I. Kayalwizhi
- Dr. Vivek Singh Malik
- Dr. Vipin Kumar Garsa
- Dr. Gopal Gupta
- Dr. Ritu Singhroha
- Dr. Arti
- Dr. Kamal Singh
- Dr. Pooja
- Dr. Sanjay Gupta
- Dr. Usha Verma
- Dr. Suman
- Dr. Neeru

C. Detail of OPD/OT/Ward Days unit wise- None

D. Services Provide by the Department including special clinics & SOPs followed in OPD, Construction, Admission, Treatment and Discharge of patient run by the Department with days:- Not applicable.

E. Duties of Consultant, Sr. Resident, Jr. Resident:-
Lectures, Practical, Seminars tutorials, Body Embalming Inspection Duty, Counseling conducting Exam, Flying Squaed Duty.

F. Responsibility of Emergency care and elective care including emergency of patients and elective surgeries:- Not Applicable.

G. Details of UG/PG Teaching programme.
UG Teaching:- MBBS ,MD, BDS , Nursing, BPT, BPO, B.Sc. Perfusion Technology, Dissections Hall Teaching, Lecture, Seminars, SDL, ECE, Tutorials, Group Dissections, Histology, Test Theory & Practical's.

PG Teaching:-
Lectures, Dissection, Teaching UG, Seminars, Microteaching, Thesis work, Histology Techniques.
Details of Hospital Round by the Faculty:- Not Applicable.

6

ACCIDENT & EMERGENCY

Sr. No	Activities	Status Yes/No	Remarks
	1. OUTSIDE EMERGENCY DEPARTMENT		
1.	There should be adequate signage in the city on main roads to inform where about of the Hospitals	**Yes**	**-**
2.	Adequate signage on the boundary wall of the hospital	**Yes**	**-**
3.	Exit/entrance signage	**Yes**	**-**
4.	Adequate lighting along the boundary wall and at entry and exit of the Hospital	**Yes**	**-**
5.	Luminescent paint for signage on the outer side and normal paint for signage inside the building (GLOW SINAGE)	**Yes**	**-**
6.	Safe drinking water facility at a prominent place near main entry of the hospital	**Yes**	**-**
7.	Designated parking facility for (a) Ambulance (b) Staff (c) Public (Clear "no parking zone" outside emergency area to ensure smooth inflow of traffic for bringing and taking emergency cases)	**Yes**	**-**
8.	One way entry and exit in the pourch leading to emergency OPD	**Yes**	**-**
9.	Adequate No. of stretchers, wheelchairs and trolleys with signage Trolley/wheelchair Bay.	**Yes**	**-**
10	Security staff to manage the entrance of the hospital and parking facility and other vital areas (in all 03 shifts)	**Yes**	**-**
11	Helpers/attendant to provide wheelchairs and trolleys (May I Help You Staff.) at entrance	**Yes**	**-**
12	Adequate signage showing location of emergency services eg. Lab, ECG, Pharmacy, Registration, Injection Room, Minor OT etc.	**Yes**	**-**
13	Red Cross Canteen/other Canteen	**-**	**No**
14	Adequate illumination in and around Emergency area	**Yes**	**-**
15	All wheelchairs and Trolleys have safety belts	**Yes**	**-**
16	Washing area for trolleys and wheelchairs	**Yes**	**-**

Sr. No	1. Design parameters	Status Yes/No	Remarks
1	Reception/ May I Help You	**Yes**	
2	Registration IPD/OPD	**Yes**	
3	MLC cell	**Yes**	
4	Injection Room	**Yes**	
5	Dressing Room	**Yes**	
6	ECG Room	**Yes**	
7	Nebulization Room	**Yes**	
8	Minor OT	**Yes**	
9	Display Emergency Drug List	**Yes**	
10	Public Telephone facility		**No**
11	Triage Area	**Yes**	
12	Waiting Area	**Yes**	
13	Consultation Room	**Yes**	
14	Hand washing Area	**Yes**	
15	Toilet for Public 28.30.31.33.34	**Yes**	
16	Toilet for disabled	**Yes**	
17	Examination Room	**Yes**	
18	Plaster Room	**Yes**	
19	Clean utility	**Yes**	
20	Dirty utility	**Yes**	
21	Observation area	**Yes**	
22	Resuscitation Area	**Yes**	
23	Store for equipment- for general store	**Yes**	
24	Toilets for staff	**Yes**	
25	Shower for patients	**Yes**	
26	Pharmacy/medication area	**Yes**	
27	Pharmacy/medication area	**Yes**	
28	X-ray—general viewing-reporting	**Yes**	
29	Nursing Staff station	**Yes**	
30	Isolation area	**Yes**	
31	Circular area	**Yes**	
32	Staff room	**Yes**	
33	Change room Male/Feale	**Yes**	
34	Toilet for staff	**Yes**	
S. No	2. Equipment	**Statues Yes/No**	**Remarks**
1.	B.P Apparatus without Mercury	**Yes**	
2.	Emergency crash cart having all emergency medicines and consumables multi parameter monitors defibrillator	**Yes**	

3.	Crash cart fully labeled & locked	**Yes**	
4.	Emergency drug tray	**Yes**	
5.	Disaster Almirah for minimum 50-100 patients along with displayed list of all items.	**Yes**	
6.	Emergency Oxygen cylinder 02 large & 02 small (minimum) apart from gas pipeline	**Yes**	
7.	Suction machine minimum 02	**Yes**	
8.	Refrigerator for Injections	**Yes**	
9.	Monitors minimum one	**Yes**	
10	Iv stands/infusion pumps	**Yes**	
11	Availability of list of Equipment (copy attached)	**Yes**	

WHO Generic Essential Emergency Equipment List (with attahched).

Sr. No	**3 Drugs:-**	**Statues Yes/No**	**Remarks**
1.	Policy for checking of expired drugs.	**Yes**	

Sr. No	**4. Records**	**Statues Yes/No**	**Remarks**
1.	Brought –dead register	**Yes**	
2.	Linen register	**Yes**	
3.	Post Mortem register	**Yes**	
4.	Specialist Call register	**Yes**	
5.	Roster for EMO and Specialists		
6.	Transfer in register		
7.	Referral register		
8.	Treatment register		
9.	OPD card MLC non MLC to be displayed		
10	IPD file complete		

Sr. No	**Miscellaneous:-**	**Statues Yes/No**	**Remarks**
1	Fire safety measures	**Yes**	
2	Availability of Telephone	**6+1**	

Sr. No	Manpower	Details	Statues Yes/No	Remarks
1.	Supervisory personnel like Resident Medical Officer or Emergency In-charge-	A dedicated person should be assigned as in charge of emergency department	**Yes Dr. Sandeep**	
2.	EMO 1. EMO 2.	Sitting duties in Consultation Room in EMOPD Attend all emergency MLC. Emergency ward patients Hospital round/attend the call for the indoor patients Dressing/Minor procedures	**Yes**	
3.	Nursing Staff		**Yes**	
4.	Emergency Medical Technicians		**Yes**	
5.	Supportive Staff	House keeping and Security	**Yes**	
6.	Other Support Staff: a) Staff for Minor OT- b) Registration clerk- c) Data Enter Operator- d) Lab Technician- e) Security staff- f) Group D staff- g) Housekeeping staff	DEO for Registration (OPD&IPD) and for MLC& PM reports	**Yes**	
7.	Pharmacist	For injection room & Dispensing of medicine & when required to assist in preparing Post Mortem Reports & for Record keeping of both consumption of injection/ Tablets and Post Mortem Record	**Yes**	

7

DEPARTMENT OF BIOCHEMISTRY

There are 5 labs namely OPD Lab, IPD Lab, Emergency Lab, Trauma Lab & RIA Lab. In OPD Lab, Samples are drawn in the sample collection center and analyzed on auto analyzer and electrolyte analyzer. They are supervised by doctor on duty and strict quality control programmes are followed.

Indoor lab caters to the samples received from the wards and they are also analyzed on auto analyzer and electrolyte analyzers. These reports are also signed by doctors on duty and strict quality control programmes are followed.

RIA Lab is present along with indoor lab in the department and it receives thyroid samples from OPDs as well as wards and they are processed by RIA (Radio-immunoassay). These reports are also signed by doctor on duty and strict quality control programmes are followed.

In 24 hours emergency lab, Samples are processed round the clock under supervision of doctor incharge. It receives samples from emergency wards. In 24 hours Trauma Lab also samples are processed round the clock under supervision of doctor incharge. It receives samples from Trauma Centres patients. The list of tests done in these labs is as under:-

Sr. No.	**IPD Lab Daily Average = 3878**	**OPD Lab Daily Average = 1673**	**Emergency Lab Daily Average= 3599**	**Trauma Daily Average = 630**	**RIA Lab Daily Average = 437**
1	B.Sugar	B.Sugar	B.Sugar	B.Sugar	T3
2	SGOT	SGOT	S. Bilirubin Total	S. Bilirubin Total	T4
3	SGPT	SGPT	S. Bilirubin Direct.	S. Bilirubin Direct.	TSH
4	S.Calcium	S.Calcium	B. Urea	B. Urea	
5	S.Phosphorus	S.Phosphorus	S. Sodium	S. Sodium	
6	S.Alk.Phosphatase	S.Alk.Phosphatase	S. Potassium	S. Potassium	
7	S.Uric Acid	S.Uric Acid	S. Amylase	S. Amylase	
8	S.Creatinine	S.Creatinine	CSF Protein/ Sugar	BGA	
9	S.Protein	S.Protein		S. Creatinine	
10	S.Bilirubin Total	S.Bilirubin Total	BGA		
11	S.Bilirubin Direct	S.Bilirubin Direct	Lactate		
12	Urine Protein	Urine Protein	S. Creatinine		
13	S.Cholesterol	S.Cholesterol			
14	S.Triglyceride	S.Triglyceride			
15	HDL Cholesterol	HDL Cholesterol			
16	B.Urea	B.Urea			
17	S.Sodium	S.Sodium			
18	S.Potassium	S.Potassium			
19	S.Amylase	S.Amylase			
20	Stone Analysis	S. Lithium			
21.	S. Lithium	---------			

8 

DEPARTMENT OF BLOOD BANK

STANDARD OPERATING PROCEDURES
Department of Immunohaematology
& Blood Transfusion
Pt. B.D. Sharma PGIMS
Rohtak (Haryana) 124001
CONTENT

Sr. No.	SOP No.	Location	Subjects
1.	01	Donor Room	Criteria for Donor Selection
2.	02	Donor Room	Donor Screening
3.	03	Donor Room	Test for Blood Donation
4.	04	Reception Room	Haemoglobin Estimation
5.	05	Quality Control Laboratory	Copper Sulphate Solution
6.	06	Donor Room	Preparation For Phelobotomy Site
7.	07	Donor Room	Selection of Bags
9.	09	Donor Room	Post Donation Care
10.	10	Donor Room	Management of Adverse Reactions in Donor
11.	11	Donor Room	Traceability of Blood Bags
12.	12	Apheresis	Apheresis
13.	13	TTI Lab	HIV by ELISA
14.	14	TTI Lab	HBsAg by ELISA
15.	15	TTI Lab	HCV by ELISA
16.	16	TTI Lab	HIV by Rapid card Method
17.	17	TTI Lab	HBsAg by Rapid card Method
18.	18	TTI Lab	HCV by Rapid card Method
19	19	TTI Lab	Malaria by Rapid card Method
20.	20	TTI Lab	VDRL by Rapid card Method
21.	21	Cross Match Lab	ABO Blood Grouping
22.	22	Cross Match Lab	Rh Blood Grouping
23.	23	Cross Match Lab	Preparation of Red Cells Suspension
24.	24	Cross Match Lab	Antibody Screening
25.	25	Cross Match Lab	Detection of incompatibility between patient and donor
26.	26	Cross Match Lab	Antiglobulin Cross-match
27.	27	Cross Match Lab	Investigation of Transfusion Reaction
28.	28	Storage Area	Inventory of Blood Bags and Blood Components
29.	29	Issue Counter	Supply of Safe Blood for transfusion
30.	30	Issue Counter	Issue of blood for transfusion
31.	31	Storage Area	Labelling of Blood Bags and Blood Components
32.	32	Storage Area	Preservation of Blood and Blood Components
33.	33	QC (Cross Match Lab)	To ensure reliability and reproductivity of blood group results
34.	34	Component Lab	Blood Component Separation
35.	35	Sterilization cum washing room	Sterilization

STANDARD OPERATING PROCEDURE

Donor Selection Criteria

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/01	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	24-02-2020

Location	**Subject**
Donor Room	Criteria for Donor Selection
FUNCTION	**DISTRIBUTION**
Assessing suitability of donor for blood donation	- Counsellor Room - Medical Officer Room - Office Document - Master File

- **PURPOSE:**

  For selection of healthy donor.

- **SCOPE & APPLICATION:**

  This SOP describes the criteria for a donor to be accepted for blood donation, for ensuring safety of donor as well as recipient. The purpose of donor selection is to identify any factors that might make an individual unsuitable as a donor, either temporarily or permanently.

- **RESPONSIBILITY:**

  The Medical Officer is responsible for determining the suitability of donor for blood donation. He/She should confirm that the criteria are fulfilled after evaluation of health history questionnaire and medical examination including the results of pre donation screening tests.

- **REFERENCE:**

  Technical Manual of American Association of Blood Banks- 13 edition, 1999 pgs 90- 97, 103-110.

- **MATERIAL REQUIRED:**

  Donor Questionnaire ·

  Donor Card

- **PROCEDURE:**

  CRITERIA FOR SELECTION OF BLOOD DONORS

  a. Accept only voluntary/replacement non-remunerated blood donors if following criteria are fulfilled.
  b. The interval between blood donations should be no less than three months. The donor shall be in good health, mentally alert and physically fit and shall not be a jail inmate or a person having multiple sex partners or a drug-addict. The donors shall full-fill the following requirements, namely:
  c. The donor shall be in the age group of 18 to 60 years.
  d. The donor shall not be less than 45 kilograms.
  e. Temperature and pulse of the donor shall be normal.

f. The systolic and diastolic blood pressures are within normal limits without medication.

g. Haemoglobin shall not be less than 12.5 g/Dl.

h. The donor shall be free from acute respiratory diseases.

i. The donor shall be free from any skin disease at the site of phlebotomy

j. The donor shall be free from any disease transmissible by blood transfusion, in so far as can be determined by history and examination indicated above.

k. The arms and forearms of the donor shall be fee from skin punctures or scars indicative of professional blood donors or addiction of self-injected narcotics.

Defer the donor for the period mentioned as indicated in the following table:

Sr. No.	Condition	Period for Defermenrt
1	Abortion	6 months
2	History of blood and blood transfusion	6 months
3	Surgery	12 months
4	Typhoid fever	12 months after recovery
5	History of malaria dully treated	3 months (endemic) 3 years (non endemic area)
6	Tatto	6 months
7	Breast feeding	12 months
8	Immunization (Cholera, Typhoid, Diphtheria, Tetanus, Plague, Gammaglobulin)	15 days
9	Rabbies vaccination	12 months after vaccination
10	Hepatitis in family or close contact	12 months
11	Hepatitis Immune globulin	12 months

Defer the donor permanently if suffering from any of the following diseases:

- Cancer
- Heart disease
- Abnormal bleeding tendencies
- Unexplained weight loss
- Diabetes
- Hepatitis B or C infection
- Chronic nephritis
- Signs and symptoms, suggestive of **AIDS** (**Note:** It is important to ask donors if they have been engaged in any risk behaviour. Allow sufficient time for discussion in the private cubicle. Try and identify result-seeking donors and refer them to VCTC (Voluntary Counseling and Testing Center). Reassure the donor that strict confidentially is maintained.
- Liver disease
- Tuberculosis
- Polycythemia Vera
- Asthma
- Epilepsy
- Leprosy & Schizophrenia
- Endocrine disorders

A detailed sexual history should be taken. Positive history should be recorded on confidential notebook.

Informed consent and Provide information regarding:

- Need for blood
- Need for voluntary donation
- Regarding transfusion transmissible infections
- Need for questionnaire and honest answers
- Safety of blood donation
- How the donated blood is processed and used
- Tests carried out on donated blood

(This gives the donor an opportunity to give his/her consent if they feel they are safe donors).

DOCUMENTATION:

Enter all details in the donor questionnaire form/card and as well in software.

STANDARD OPERATING PROCEDURE

Physical Examination of Donor

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/02	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	05	Dr. Dimple Mehrotra	24-02-2020

Location	**Subject**
Donor Room	Donor Screening
FUNCTION	**DISTRIBUTION**
Physical examination of the donor	- Donor Room - Medical Officer Room - Hb and ABO&Rh lab - Office Document - Master File

PURPOSE:

- **SCOPE & APPLICATION:**
  To perform a physical examination on the donor for confirming fulfilment of the criteria which ensure safety of the donor as well as the recipient..
- **RESPONSIBILITY:**
  It is the responsibility of the on duty Laboratory Technician, Donor Counsellor and Medical Officer to perform the physical examination on the donor.
- **REFERENCE:**

a. Introduction to Transfusion Medicine, Zarin Bharucha & Chauhan DM 1 edition 1990, Pg. 97-98th.
b. Technical Manual of American Association of Blood Banks, 13 edition 1999, Pg. 93-95

- **MATERIAL REQUIRED:**

a. Weighing scale
b. Sphygmomanometer
c. Clinical thermometer
d. CuSO4 in Coplin's jar Capillaries Lancet
e. Donor card

- **PROCEDURE:**

MEDICAL EXAMINATION

a. General Appearance: Defer a donor who appears ill, under the influence of drugs/alcohol or do not appear to be providing reliable answers to medical history.
b. Check and enter donor's weight. The weight should be >50 kg to collect 450 ml and between 45 and 50 kg to collect 350ml blood.
c. Check if the blood pressure, pulse and temperature of the donor are within the acceptable limits:
d. Systolic blood pressure not > 160 mm of Hg.
e. Diastolic pressure not > 100 mm of Hg.
f. Pulse regular, between 60 and 100 beats / minute.
g. Oral temperature 37.5 C +/- 0.2C (98.6F =/- 0.5F).

HAEMOGLOBIN ESTIMATION:

Blood donation can be accepted only if the haemoglobin is > 12.5 g/dl. Test for haemoglobin by CuSO4 specific gravity method (Refer SOP 003).

DOCUMENTATION:

Enter details in the donor card/computer

STANDARD OPERATING PROCEDURE

Donor Selection Criteria

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/03	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dr. Dimple Mehrotra	24-02-2020

Location	**Subject**
Donor Room	Qualifying Test for Blood Donation
FUNCTION	**DISTRIBUTION**
Method of estimation of donor's haemoglobin by copper sulphate method	- Medical Officer Room - Hb Estinmation Lab - Office Document - Master File

PURPOSE:

To estimate Hemoglobin of Blood Donor.

- **SCOPE & APPLICATION:**

  To find a fit and healthy donor, assuring his or her safety. This also helps in assuring the quality of the product.

- **RESPONSIBILITY:**

  It is the responsibility of the Lab Technician, Staff Nurse working in the donor area.

- **REFERENCE:**

  Technical Manual of American Association of Blood Banks, 13 edition, 1999 Pg. 711- 712.

- **MATERIAL REQUIRED:**

a. Copper sulphate working solution with a specific gravity 1.053.
b. Sterile gauze/cotton, spirit and sterile disposable lancets or needles.
c. Containers with 1% sodium hypochlorite solution for disposing sharp lancets, capillaries and bio hazardous materials.
d. Coplin jar with lid.

PROCEDURE:

- **Principle:**

  This is a qualitative test based on specific gravity. The drop of donor's blood dropped into copper sulphate solution becomes encased in a sac of copper proteinate, which prevents any change in the specific gravity for about 15 seconds. If the haemoglobin is equal to or more than 12.5 gm/dL the drop will sink within 15 seconds and the donor is accepted.

  (Note: Do not depend on colour of tongue or conjunctiva. Only accept a donor only if haemoglobin is >12.5g/dl).

- **Technique:**

a. 30ul copper sulphate working solution (Sp.gr.1.053) in a clean, dry coplin jar is used for determining hemoglobin. The jar is kept covered with a lid when not in use. The working solution is changed after every 25 tests.
b. The fingertip is cleaned thoroughly with a spirit swab and allowed to dry.
c. The finger is punctured firmly near the tip with a sterile disposable lancet. A good free flow of blood is ensured. The finger is not to be squeezed repeatedly since it may dilute the drop of blood with excess tissue fluid and give false low results.
d. The first drop of blood is wiped and ¾ of the micro capillary is allowed to fill with blood sample by capillary force, without any air bubbles.
e. Allow one drop of blood to fall gently from the capillary from a height of about 1 cm above the surface of the copper sulphate solution, into the coplin jar.
f. The drop of blood is observed for 15 seconds.
g. The lancet and capillaries are disposed off in a container with 1% sodium hypochlorite solution.

- **Interpretation:**

a. If the drop of blood sinks within 15 seconds (i.e. donor's haemoglobin is more than 12.5gm/dL), the donor is accepted for blood donation.
b. However, if the blood drop sinks midway (i.e. haemoglobin level is less than 12.5gms/dL), and then comes up, the donation or donor is deferred.
c. If the drop sinks slowly, hesitates and then goes to the bottom of the jar, confirm the haemoglobin of this donor.
d. If the donor fails the CuSO4 test, repeat haemoglobin by Sahli's / Drabkin's / Automated Cell Counter.
e. In case if the haemoglobin is lower than 12.5g/dL, prescribe haematinics and ask the donor to come for a recheck after one month.

- **DOCUMENTATION:**

  Enter the results on donor card as well in the Hemoglobin report register.

STANDARD OPERATING PROCEDURE
PREPARATION OF CUSO4 SOLUTION

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/ 04	01.03.2020	1	Yogesh	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	2 Years	3	Dr. Dimple Mehrotra	24.02.2020

Location	**Subject**
Donor Room	Haemoglobin Estimation
FUNCTION	**DISTRIBUTION**
Preparation of CuSo4 solution	- Donor Area - Medical Officer In charge - Master File

- **Purpose:**
  Estimate the haemoglobin of blood donor before donation
- **SCOPE & APPLICATION:**
  The Specific gravity of 1.053 is equivalent to 12.5 g/dl haemoglobin. Hence CuSO4 solution of Specific Gravity 1.053 is used for pre-donation Hemoglobin test in case of blood donor.
- **RESPONSIBILITY:**
  The Medical Technologist (Lab) in the donor area.
- **REFERENCE:**
  Bangladesh gazette, extra, 7th may 2005, pate no.- 2492 Model SOP for Blood Transfusion service by WHO 2002.
- **PROCEDURE:**

a. Stock solution is made as follows and kept in a jar or bottle
b. Dissolve 159.64 gm crystalline CuSO4, in 1000 ml distilled water.
c. Working solution for SP gr 1.053
d. Every morning prepare fresh solution.
e. Add 52 ml stock solution to 48 ml distilled water.
f. Cheek Specific Gravity which should be 1.053. If not adjusting it using either stock solution or Distilled Water.

- **DOCUMENTATION:**
  Record the volume of stock and working solution prepared on the register.

STANDARD OPERATING PROCEDURE
Donor Selection Criteria

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/05	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Quality Control Laboratory	Copper Sulphate Solution
FUNCTION	**DISTRIBUTION**
Quality Control Of CuSo-4	- Quality Control Laboratory Supervisor - Quality Manager - Office Document - Master File

- **PURPOSE:**
  To prepare the quality of copper sulphate solution for Hemoglobin estimation.
- **SCOPE & APPLICATION:**
  Copper sulphate solution is used for screening blood donors by testing the haemoglobin concentration before blood donation. Copper sulphate solution is checked to ensure that a drop of blood sample of predetermined haemoglobin value reacts as expected (sinks/floats).
- **RESPONSIBILITY:**
  It is the responsibility of the Quality Control personnel to ensure testing of the reagent before use.
- **REFERENCE:**
  Technical Manual of American Association of Blood Banks, 13 Edition, 1999, pg 56.
- **MATERIAL REQUIRED:**

a. Equipment:
b. Urinometer

Reagents:

a. Copper sulphate working solution
b. Distilled water
c. EDTA blood samples of known haemoglobin concentration needles.

- **Glassware:**

a. Coplin jar
b. Heparinised capillaries

- **Miscellaneous:**

a. Tissue paper
b. Copper sulphate record book
c. Tube racks

- **PROCEDURE:**

a. Check the copper sulphate solution against a light source for the presence of precipitate/cloudiness.
b. Check the specific gravity of the solution using a urinometer.
c. Copper sulphate being a colored solution, the marking of the urinometer corresponding to the upper meniscus of the solution should be 1.053=12.5g% of haemoglobin.
d. Arrange the blood samples according to haemoglobin concentration in a rack.
e. Obtain samples of known Hb values.
f. Transfer 30ml copper sulphate working solution in a Coplin.
g. Jar Mix the blood sample of known haemoglobin concentration by inversion.
h. Fill heparinised capillary up-to ¾ capacity with the blood sample.
i. Allow the drop of blood to fall gently into the copper sulphate solution.
j. Repeat the procedure for all the blood samples.
k. Note the result.
l. Record the results in the copper sulphate record book.

- **RESULTS:**

The results are noted in the copper sulphate record book in Tabulated form.

STANDARD OPERATING PROCEDURE

Preparation For Phelobotomy Site

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/06	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
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Location	**Subject**
Donor Room	Blood Collection
FUNCTION	**DISTRIBUTION**
Solutions and method for preparing phlebotomy site	- Medical Officer in Charge of Donor Room for all phlebotomists - Office Document - Master File

PURPOSE:

To prevent the infections from donor site or to donor site.

SCOPE & APPLICATION:

Cases of transmission of bacterial infection in blood are fortunately rare, but when they occur, can be fatal. Thus careful preparation of the skin at the phlebotomy site before venepuncture is very important.

RESPONSIBILITY:

The phlebotomist collecting the blood unit from the donor is responsible for preparation of phlebotomy site.

REFERENCE:

Technical Manual of American Association of Blood Banks, 13 edition, 1999 Pg. 713.

MATERIAL REQUIRED:

Sterilising tray
Demethylated spirit
Povidone Iodine
Cotton/gauze/swabs
Artery forceps
TourniquetUrinometer

PROCEDURE:

After selection of the vein for venepuncture, apply spirit, povidone-iodine(Ioprep) and finally spirit swab, in this order, to the skin at the phlebotomy site.

Start disinfection of the skin of about an area of 5 cm diameter from the centre outwards in a circular motion.

Scrub the providone-iodine vigorously for at least 30 seconds or till froth forms. Do not touch the site prepared for venupuncture.

It should it be necessary, touch the skin away from the point of needle insertion. If the puncture site is touched, repeat skin preparation procedure as detailed earlier.

Discreetly check the used swab. If it is physically soiled/contaminated, take a new swab and repeat skin preparation procedure as detailed earlier.

Dispose off used swab(s) into a waste bin meant for bio-hazardous materials.

Allow the skin to air dry. Do not wipe the area with cotton wool, fan or blow on it.

STANDARD OPERATING PROCEDURE

Selection of Blood Bags

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Location	**Subject**
Donor Room	Selection of Bags
FUNCTION	**DISTRIBUTION**
Choice of bag depending on component to be prepared	- Medical Officer-in-Charge of Donor Area for use of all technicians, staff nurses &phlebotomists - Office Document - Master File

PURPOSE:

To selection of blood bags.

SCOPE & APPLICATION:

According to the components to be prepared from the blood unit and the weight of the donor the blood bags are selected for blood collection.

RESPONSIBILITY:

The technician or staff nurse or phlebotomist in the donor area coordinates with the component room for deciding the type of blood bags to be used. The medical officer is consulted in case of difficulty in making a decision or to optimise the availability of components.

REFERENCE:

Introduction to Transfusion Medicine, Zarin Bharucha & D M Chouhan, 1 edition 1990, Pgs 116, 124.

MATERIAL REQUIRED:

Different types of blood bags in use

PROCEDURE:

Select the bag as per the following chart:

Donor		**Component**	**Bags**	
Weight	**Aspirin Intake**	**Required**	**Type**	**Quantity required**
>55 kg	**No**	PC+FFP+PLT	Triple or Quadruple	450 ml
>55 kg	**Yes**	PC+FFP PC+FVIIID+CRYO	Double	350/450m
45-55 kg	**No**	PC+FFP PC+FVIID+CRYO PC-PLT	Double	350ml
45-55 kg	**Yes**	PC+FFP PC+FVIIID PC+FVIID+CRYO	Double	350ml

PC : Packed Cells FFP : Fresh Frozen Plasma PLT : Platelets FVIIID : Factor VIII Deficient Plasma Cryo : Cryoprecipitate

Before choose the blood bag, it always be keep in mind that:
Check the bag visually
In case of puncture or discolouration, do not use
Check the expiry date of the bag
Use single bag when;
Components are not to be separated from that unit.
When autologous blood is collected for patients e.g. elective surgery.
Therapeutic phlebotomy is being performed on a patient.

DOCUMENTATION:

Enter the following details on donor card and register:
Type of bag
Manufacturer's name
Batch No.
Expiry date

STANDARD OPERATING PROCEDURE

Phlebotomy

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SOP/08	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
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Location	**Subject**
Donor Room	Phlebotomy
FUNCTION	**DISTRIBUTION**
Collection of Blood Units	- Medical Officer-in-Charge of Donor Area for use of all technicians, staff nurses &phlebotomists - Office Document - Master File

PURPOSE:

To collect the blood unit from donor.

SCOPE & APPLICATION:

This describes a procedure for blood collection from the donor, using an aseptic method. Blood is collected in a sterile closed system bag with a single venepuncture. A correct performance of venepuncture is essential for the quality and safety of the blood donation. Successful venepuncture results not only in safe collection of a full unit of blood suitable for separation of components with good quality yields, but also contributes to the comfort and satisfaction of the donors thus encouraging re-attendance.

RESPONSIBILITY:

The phlebotomist or technicians or staff nurse and doctor is responsible for blood collection from the donor after verifying the donor screening details, checking the unit number labels and preparing the phlebotomy site.

REFERENCE:

Technical Manual of American Association of Blood Banks, 13 edition 1999 Pgs 98, 713-716.

Introduction to Transfusion Medicine, Zarin Bharucha & D M Chouhan 1 edition 1990 Pg 99 - 100.

MATERIAL REQUIRED:

Cotton/Gauze swabs
Artery forceps
2% Xylocaine
Disposable plastic syringes (2ml)
Disposable needles (26 gauge)
Pilot tubes:
Plain and EDPA
Tourniquet
Oxygen cylinder with accessories
Rubber gloves
First aid tray
Tubing stripper
Electronic tube sealer
Needle destroyer
Blood collecting bags
Discard jar with 10% sodium hypochlorite
Scissors
Hi Tech (adhesive) tapes
Blood bag mixer (Bio mixer)
Comfortable donor couch or chair

PROCEDURE:

Make the donor lie down with a pillow under the head or recline in a comfortable donor chair. Loosen tight garments.
Identify the donor by name. Enter the bag and segment numbers on the donor card/form.
Ask the donor if he/she is in a comfortable position. Give the donor a hand roller / squeezer to hold.
Select a bag for blood collection (SP 007).
Clean the venepuncture site (SP 006) (f) Set the biomixer for the required volume of blood (350/450ml) to be collected and place the bag on it.
Apply the tourniquet on donor arm.
Clamp the bleed line of the blood bag using plastic forceps to ensure that no air enters the tubing or bag once the needle cover is removed.
Keep the level of the needle facing upward and the shaft at an angle of 15 to the arm.
Once the needle is beneath the skin, release the clamp.
Insert the blood bag needle into the vein for about 1 to 1.5 cms by a bold single prick to ensure smooth flow of blood and secure on the arm with adhesive strips.
Advise the donor to gently squeeze the hand roller to improve blood flow.
If the venepuncture is unsuccessful do not make further attempt in the same arm. Take the donor's permission for a second attempt. Use a new bag.
Once blood enters the bag tubing, press the bio mixer 'start' switch to allow the blood to flow into the bag. After the programmed volume of blood is collected, the bio mixer automatically clamps the tubing.
Clamp the bloodline at 2 sites and cut in the middle. Collect blood in the pilot tubes from the tubing so that blood flows directly into the tubes from the donor arm.
Release the tourniquet and remove the needle gently from the donor's vein pressing the phlebotomy site. Fasten a Velcro cuff around the donor's arm in a flexed position.
Seal the blood bag tubing with the tube sealer.

Burn the needle of the bag in the needle incinerator. Discard the tubing with the burnt needle in a container of sodium hypochlorite solution

- **DOCUMENTATION:**

Make entries in the donor register as well as in computer.
Make an entry of the failed venepuncture, as double prick.

STANDARD OPERATING PROCEDURE
Post Donation Care

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Location	**Subject**
Donor Room	Blood Collection
FUNCTION	**DISTRIBUTION**
Post Donation Care	- Medical Officer-in-Charge of Donor Area for use of all technicians, staff nurses & phlebotomists - Office Document - Master File

PURPOSE:

To instruct the donor after blood donation.

SCOPE & APPLICATION:

The donor needs to be observed after blood collection, in order to attend to any adverse reactions in the immediate post-donation period.

RESPONSIBILITY:

The medical officer or staff nurse or technician in attendance attends to the donor..

REFERENCE:

Technical Manual of American Association of Blood Banks, 13 edition 1999 Pgs. 98-99.
Introduction to Transfusion Medicine - Zarin Bharucha & D.M. Chouhan 1 edition 1990 Pgs. 100-101.

MATERIAL REQUIRED:

Sterile swabs
Adhesive tape
Thrombophob ointment
Leaflet for post donation instructions

PROCEDURE:

To prevent adverse reactions like giddiness ask the donor not to get up from the chair/cot for 5 minutes even if he feels perfectly all right.
Observe for another 10 minutes in the refreshment area whilst having coffee.
Inspect the venepuncture site before the donor leaves the donor room. Apply an adhesive tape only after oozing stops. If there is persistent oozing at the site of venepuncture, apply pressure with a dry, sterile cotton swab. If there is haematoma apply Thrombophob ointment gently over the area after 5 minutes. Inform the donor about the expected change in skin colour. If the pain persists, ask him/her to apply ice.

Instruct the donor to drink adequate fluid in the day and avoid strenuous activities. n

DOCUMENTATION:
Give a leaflet of post donation instructions to the donor.
Record any adverse reaction on the donor card as well as in donorvigilance register.

STANDARD OPERATING PROCEDURE

Management of Adverse Reactions in Donor

Number	**Effective date**	**Page**	**Author**	**Authorised by**
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Location	**Subject**
Donor Room	Blood Collection
FUNCTION	**DISTRIBUTION**
Management of adverse reactions in a donor	- Medical Officer-in-Charge of Donor Area for use of all technicians, staff nurses &phlebotomists - Office Document - Master File

PURPOSE:
The management of Adverse reactions in blood donor.
SCOPE & APPLICATION:
Any adverse reaction in the immediate post-donation period requires to be attended.
RESPONSIBILITY:
The medical officer in attendance is responsible for managing the adverse reaction in the donor.
REFERENCE:
Technical Manual of American Association of Blood Banks 13th edition 1999 Pgs. 99-100.
Introduction to Transfusion Medicine Z.S. Bharucha & D.M. Chouhan 1 edition 1990, Pgs. 101-102.
MATERIAL REQUIRED:
Following materials are required to attend to any emergency arising in the post donation period.
Oral medication:
a. Analgesic Tablets
b. Calcium and Vitamin C Tablets
c. Electrolyte replacement fluids

Injections:
Epinephrine (Adrenaline)
Atropine sulphate
Pheniramine maleate

Diazepam
Glucocorticosteroid
Glucose (Dextrose 25%)
Furosemide
Metoclopromide
Prochlorperazine maleate
Sodium bicarbonate
Glucose saline (Sodium chloride and Dextrose 500 ml).

Antiseptics:

Savlon
Mercurochrome
Tincture benzoine
Hydrogen peroxide

Miscellaneous:

Bandages/Dressings
Band-aids
Anti-histaminic cream
Heparin and Benzyl Nicotinate ointment
Smelling salt-Spirit of Ammonia
AnaAnalgesic balm
Tongue depressor
Disposable syringes and needles 22 guage
Clinical Thermometer
Oxygen cylinder
Infusion set
Paper bag

MANAGMENT OF ADVERSE REACTION:

Giddiness/Syncope (vasovagal syndrome):

Raise feet and lower head end.
Loosen tight clothing (belt, tie etc.).
Ensure adequate airway.
Check pulse and blood pressure.
Apply cold compresses to forehead and back.
Administer inhalation of spirit of ammonia if needed.

The donor should respond by coughing which will elevate the blood pressure. **(If there is bradycardia and hypotension then administer inj. Atropine 1 ml IM, if bradycardia continues for more than 20 minutes? Administer IV normal saline or dextrose saline infusions if hypotension is prolonged).**

Convulsions: Keep the head tilted to the side; prevent the tongue bite; keep the airway patent by inserting a tongue blade or gauze between the teeth.

Vomiting: Usually this provides relief. If the donor feels nauseous or if vomiting is severe, inject Stemetil. Usually subsides on its own.

Tetany/muscularspasm/twitching: These are usually due to hyperventilation in an apprehensive donor. Ask the donor to breath in a paper bag, which provides prompt relief. Do not give oxygen.

Haematoma: Release the tourniquet/pressure cuff immediately. Apply pressure on the venepuncture site and withdraw the needle from the vein. Raise the arm above the head for a few minutes. Apply Thrombophob

ointment gently around the phlebotomy site after about 5 minutes. Advise the donor to apply ice if there is pain and inform about the expected change in skin colour.

Eczematous reactions of the skin around venepuncture site: Apply steroid ointment.

Delayed syncope: These may occur as late as 30 minutes to 1 hour after donation, usually after the donor has left the blood bank. Permanently defer any donor who gives history of such attacks more than twice.

DOCUMENTATION:

Enter details of adverse reactions and the management in the donor card/form or register.

Keep a record of stocks of materials required, especially the expiry date of medicine.

STANDARD OPERATING PROCEDURE

Traceability of Blood Bags

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Location	**Subject**
Donor Room	Traceability of Blood Bags
FUNCTION	**DISTRIBUTION**
Method of accurately relating product to donor	- Medical Officer-in-Charge of Donor Area for use of all technicians, staff nurses &phlebotomists - Office Document - Master File

PURPOSE:

To manage blood bags and pilot tubes of accurately relating product to donor.

SCOPE & APPLICATION:

To label the blood bags and pilot tubes after verification of donor details in order to accurately relate the blood product to the donor. The unit number label is the unique identifier for the donor and all the blood components separated from the unit collected from the donor.

RESPONSIBILITY:

It is the responsibility of the phlebotomist or technician or staff nurse collecting the blood units to ensure proper labelling and recording of the requisite details, even if the donor area attendant affixes the labels.

REFERENCE:

Model STANDARD OPERATING PROCEDURES for BLOOD TRANSFUSION SERVICE BLOOD TRANSFUSION SERVICE, World Health Organization New Delhi (SOP NO. 011).

MATERIAL REQUIRED:

Sticker labels with pre printed serial number (10 Labels/Unit Number) or donor serial numbers from donor register as per serial marked with black marker.

PROCEDURE:

Give each donor a unique number and once his blood is collected, identify by that number only.

Do not write donor's name on his/her blood bag or sample tube. This maintains the donor's confidentiality.

Affix pre printed number labels on the primary bag on both sides, on all the satellite bags in case of multiple bags and the three pilot tubes (2 plain and one with CPD anticoagulant).

Verify the donor's identity by tallying with the name on the master registration card.

Affix the unit number label, which is loosely attached to the bag now to the card.

Cross check the numbers on the bag, pilot tubes and master registration card to ensure identity. Record the entry in the donor register using the same number.

Transcribe this number on all records hence forth for storage, testing and distribution.

Whilst issuing the unit, use the same number on issue record..

DOCUMENTATION:

Make sure that the number is written clearly on all records and there are no transcription errors, as this number will trace any product to the donor of the blood and vice versa in case of requirement.

STANDARD OPERATING PROCEDURE
PLATELET APHERESIS

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SOP/12	01/03/2020	07	Yogesh Kumar	Dr. Gajender Singh
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Location	Subject
Apheresis Room	Apheresis
FUNCTION	**DISTRIBUTION**
Separation of SDP	- Apheresis Room - Office Document - Master File

PURPOSE:

To separate the Single Donor Platelets (SDP).

SCOPE & APPLICATION:

The selective separation and removal of thrombocytes (platelets) from withdrawn blood and the remainder of the blood then being re-transfused into the donor through cell separator is called plateletpheresis. Many lifesaving medical treatments require platelet transfusions. Cancer patients, those receiving organ or bone marrow transplants, victims of traumatic injuries, and patients undergoing open heart surgery require platelet transfusions to survive.

Because platelets can be stored for only five days, This standard operating procedure (SOP) applies to apheresis procedure using the Fresenius COM.TEC apheresis instruments for single donor platelet collection.

RESPONSIBILITY:

It is the responsibility of the trained Technician, Staff Nurse to perform the procedure under the supervision of Medical officer.

REFERENCE:

https://www.thermofisher.com/us/en/home/life-science/cell-analysis/cell-isolation-and-expansion/cell

isolation.html?gclid=CjwKCAjwiPbWBRBtEiwAJakcpBUnwyVcyTYG_lxxdKnV1mRa2UxZNJAEO8WOvQ4LZLBYR
MlMXPzsBoCPeAQAvD_BwE&s_kwcid=AL!3652!3!248651428026!b!!g!!%2Bblood%20%2Bcell%20%2Bseparation&ef_id=WstaPwAAAMSRUDF0:20180423083423:s
http://www.sankalpindia.net/book/platelet-apheresis-complete-guide
https://www.kimsmedicalcollege.org/clinical/21.04.16-Plateletpheresis.pdf

MATERIAL REQUIRED:

Equipment:

Fresenius COM.TEC apheresis instruments
Platelet Apheresis Kit
BP instrument
Stethoscope
Tube Sealer
Urinal
Tourniquet
Com.tec Operator's Manual
Venipuncture and Sampling Supplies
Hand gripper
Venipuncture preparation supplies.
Sample tubes

Reagents and solutions:

Adequate quantity of Anti-coagulant solution ACD-A-500 ml
Normal Saline (0.9% NACL)-1000ml
Spirit
Cotton swab
Band Aid
Emergency injection and drugs
1:10 dilution of bleach solution OR other acceptable antimicrobial solution
Biohazardous container
Hand wash agent
Soap and water

PROCEDURE:

The operator's manual for the Fresenius COM.TEC apheresis instruments and the direction for use with the apheresis kit should be followed always.

Terminology: Apheresis is a Greek word meaning "to take away" involve the selective removal of blood components from blood donors / patients. Automated blood processing devices are used for both component preparation and therapeutic application of apheresis. In apheresis instrument centrifugal forces separate blood into component based on difference in density. A measured amount of anti-coagulant is added to the whole blood during drawing blood from the donors / patients.

This term can be sub divided into three categories:

Cytaphresis: Selective removal of cellular component from whole blood. These include Erythrocytes, Thrombocytes, Leucocytes and stem cells.

Plasma Apheresis: Selective removal of plasma containing elements refer to as fractional components, such as clotting proteins and immunoglobulins.

Platelet Apheresis: Selective removal of platelets from whole blood.

Criteria for donor selection for platelet apheresis same as for normal blood donation except:

Written consent on donor card before procedure is commenced and the procedure should be explained to the donor with its benefits and risk.

The medical officer shall certify that donor is fit for apheresis through donor selection.

The procedure shall be carried out by a trained person under supervision of a medical officer.

Platelet apheresis shall not be carried out on donors who had taken medication containing aspirin within three days prior to donation.

If during platelet apheresis RBC's can not be re-transfused than at least 12 weeks shall have elapsed before a second procedure is conducted.

The quantity of plasma separated from the blood of a donor shall not exceed 500 ml per sitting and once in a fortnight or shall not exceed 1000 ml per month.

Good venous access for successful phlebotomy as well as return of remaining component of blood to the donor.

Minimum height and weight for the blood volume of 4 litres.

CBC performed prior to platelet apheresis.

TTI test performed prior to platelet apheresis.

Pre-platelet count should be more than $2.0 \text{ X } 10^{11}$.

Predicted platelet yield ($1.5 \text{ X } 10^{5} \text{ X } 4 \text{ Litres} > 2.5 \text{ x } 10^{11}$).

Total blood process shall not be more than total blood volume.

The minimum interval between two procedures should be 72 hours and not more than twice in a week and 4 times in a month for the same donor.

The worksheet for the procedure be kept ready to be filled during each cycle.

Disposable set installation (kit): The message install S5L prompts the operator to install the apheresis kit

Open all pump doors

Press the turn pump key

Deposit the packing on the centrifuge door. Ensure that each pump line segment is located under the matching color coded pump.

Take the rolled-up tubing out of the packing, close the red inlet clamp just below the branch to the pre-sampling bag.

Close the white needle clamp and suspend the connecting line literally at the upper right of the device.

Suspend the concentrate bag from the rear hook on the left of the device

Close the clamp between the concentrate bag and PC sampling bag.

Suspend the empty bag above the return drip chamber.

Suspend the plasma bag above clamp 4.

Suspend the single needle bag at the left side of the plasma bag.

Install all pumps line segments, so that color of pump coding match.

Press Turn Pump key.

Close all pump doors.

Install the return air drip chamber in the air detector.

Install the plasma line in clamp 4 between the Y piece and drip chamber.

Install the plasma line section marked by yellow tabs into the Hb/Hct detector.

Insert the line leading to empty bag in clamp 5.

Insert the return line clamp 1.

Insert the inlet line of the cell pump into cell detector.

Insert the green colored drip chamber of the ACD line into the drip chamber and pull

The drip chamber completely down.

Install the ACD pump tubing into ACD pump and hit the **TURN PUMPS** key

Install the saline line in clamp 2.

Install the single needle collecting/return line in clamp 3 between the blue marks.

Install the inlet line leading to the single needle control with the red mark below the Y connector in clamp 6.

Install the pressure filters into appropriate ports inlet-red, Outlet-Blue.

Install the separation chamber in the correct C5L Dual chamber holder.

Push the centrifuge holder onto the guide rail until it is felt to be locked.

Pass the centrifuge tubing through the line guide.

Rotate the chamber counter clockwise to verify the correct installation.

Close the centrifugation followed by placing the air protect in the holder.
(NOTE: Single needle kit is provided with one saline line only, Installed kit should be used within 24 hours)

Priming:

Connect saline line to normal saline container. Connect the ACD tubing to ACD-A bag. After connecting the lines Press PRIME key. The alarm test screen will be displayed following pressing the PRIME key. This test is performed automatically. Start and end of the test is indicated by audible alarms. Alarm test is followed by priming of the whole kit using saline to remove any air in the kit and processed saline is diverted to the diversion bag. Once priming is over machine gives an option for selecting second priming to remove all air still present in the kit and second priming is optional.

NOTE:-Primed kit should be used within 8 hours.

Separation:

Insert the needle after vein puncture. Open the white needle clamp and collect at least 20 ml of blood, close the white needle clamp and seal off the pre-sampling bag.

Open the red clamp on the inlet line.

Apply the single needle cuff to the fully extended and relaxed upper arm of the donor.

Connect the cuff to the cuff port to on the rear connector panel and ensure the connected line is not squeezed or kinked.

By pressing the **START** key the cuff is inflated up to 50mmhg facilitate the puncturing of the donor. Inflate cuff can be skipped by pressing the **CONTINUE** key.

Enter the donor values like Sex, Height, weight and pre-platelet and pre HCT count in the donor value entry screen and press **OK** key.

Enter the blood flow, required yield and pc volume in the procedure value entry screen hit **OK** key.

Start the separation procedure by hitting the **START** key. open the return blue clamp once the blood flow starts through the inlet line to centrifugation chamber. **NOTE:** In the Donor value entry screen total blood volume of the donor is auto calculated, the ACD to blood ratio and infusion rate of ACD is auto calculated by the equipment which is as per standards. If donor influence any changes in the above values operator takes the responsibility on ACD effect on the donor.

Caution: If no current donor values are entered default values will be taken from the configuration menu. Any change in the pre-set values machine gives the value with a symbol. If the value crosses the safety standards machine flashes the values.

Reinfusion: Once the desired volume of PC is collected Reinfusion phase starts

Press the continue key.

Close the red inlet clamp, make sure blue return clamp is opened.

Completely open red roller clamp of the saline.

Close the yellow clamp on the plasma collection bag.

Disconnect the donor from the inlet line.

Press the **CONTINUE** key.

All the left blood components in the extra corporeal circuit red cells. Plasma & leukocytes are re-infused to the patient.

Deaeration of the product concentrate bag as to be processed by hitting the deaeration key, as soon as deaeration is over press the **STOP** key.

Use the up and Down arrow key to select exit Reinfusion.

Hit the **Ok** Key

Removing Of the Set: Seal off the concentrate bag and remove the set once the above procedures are over. Only during this procedure all eccentric clamps are open. After report has been printed, the device can be started for another separation by pressing the **RESET** key. Press the **O** key to switch off the device. At the end of the procedure entire report of the procedure will be printed.

Labelling and Storing Platelet Product:

Label the platelet product

Place the Platelet product on appropriate platelet agitator cum incubator.

The platelets should be maintained at room temperature (20-24^{0}C) for a maximum of five days (per AABB guidelines).

Post Procedural Step: Deaerate the platelet bag by gently pressing. Incubate the bag at room temperature for one hour, followed by a gentle agitation in platelet agitator for an hour. Check the qc using a Five part or Three-part cell counter with sample in the PC concentrate bag. Incubation and Agitation helps removing the activated platelets.

STANDARD OPERATING PROCEDURE
Anti-HIV Testing

Number	**Effective date**	**Page**	**Author**	**Authorised by**
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Location	Subject
TTI Room	Anti-HIV Testing
FUNCTION	**DISTRIBUTION**
Sample tested for Anti HIV antibodies and HIV Antigen by ELISA method.	- TTI Room - Office Document - Master File

PURPOSE:

To detect the anti-HIV antibodies and HIV antigen in the donor blood specimen

SCOPE & APPLICATION:

Anti HIV antibodies testing is carried out on all bag samples before these are released for transfusion. Pre-donation samples of apheresis donors are also tested.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab; to carry out the test and report as required.

REFERENCE:

Kit package insert.

Technical Manual of American Association of Blood Banks – 15th Edition, 2005.

MATERIALS REQUIRED:

Reagent kit

Mircopipettes and disposable pipette tips

Timer

ELISA reader

ELISA Washer

Incubator 37^0C

Glassware

Distilled water.

Specimen – clotted blood sample of the donor.

PROCEDURE

Preparation of the reagents:

Bring all the reagents to room temperature for 30 minutes before use.

Take the required number of strips from sealed HIV Antigen-antibody coated microplate, and the remaining strips must be kept at 2-8^0C with a silica gel (desiccant) in an aluminium pouch.

Preparation of Washing Solution: Make a 1:20 dilution of Washing Solution with distilled or de-ionized water (to the extent of required amount for example, add 10 ml of concentrated Washing Solution to 190 ml distilled or deionized water). Washing Solution may be crystallized at cool storage condition. If crystallized, use it after thawing at 37^0C water-bath maintained at 37^0C.

Preparation of Conjugate: Make a 1:51 dilution of Conjugate concentrate with Conjugate Diluent to the extent of required amount, 10 minutes before use (Refer Table 1. Shake well before use.

Table

Stripsrequired	1	2	4	6	8	10	12
Conjugate diluents (ml)	1	2	4	6	8	10	12
Concentrated conjugate(µl)	20	40	80	120	160	200	240

ASSAY PROCEDURE

Prepare working Conjugate solution and Washing solution as per requirement.

Use only the number of wells required for the test. Avoid touching the tops or bottoms of the wells. Replace the remaining wells in the provided zip lock pouch and seal it immediately.
Add 50 µl of diluent in each well except blank
Add 100 µl negative control in B-1 TO D-1 and positive control in E-1,F-1.
Add 100 µl specimen from G-I onwards.
Cover the well with adhesive strip and incubate for 30 minutes at 37 degree temperature.
At the end of incubation, discard the content of the plate blot the plate dry on the absorbent paper.
Fill the wells with wash buffer and allow to soak for 30 seconds thereafter decant the buffer and blot the plate on absorbent paper. Repeat this step four times.
After washing, add 100 µl of Biotinylated HIV p24 antibody conjugate to all wells except blank.
Cover the wells with adhesive strip and incubate for 15 minutes at 37 degree temperature.
At the end of the incubation time, discard the content of the plate blot it on absorbent pad.
Add 100 µl of working conjugate to all wells except blank well(A1).
Cover the wells with adhesive strip(s) and incubate for 15 minutes at 37°C +- 1°C.
At the end of the incubation time wash the plate as described in step 7 and 8.
Immediately after washing the plate, add 100 µl of Substance Solution to each well.
Cover the wells with adhesive strip(s) and incubate for 30 minutes in dark at room temperature. A Blue or bluish green colour should develop in wells containing reactive samples.
Add 50 µl of Stop Solution to each well.
Within 15 minutes read the absorbance at 450 nm using 630 nm as the reference wave length.

QUALITY CONTROL

The absorbance of the blank should be less than 0.050.
The average absorbance (PCx) of both the Positive Controls should be greater than or equal to 1.0.
The average absorbance (NCx) of the Negative Control should be less than or equal to 0.100.
If the results are outside the above range, the test should be conducted again.

INTERPRETATION OF RESULTS

Calculation of the cut off value.

Calculation the Negative Control mean (NCx)

Negative control 1 absorbance = 0.045
Negative control 2 absorbance = 0.043
Negative control 2 absorbance = 0.044
Negative control mean (NCx) = (0.045 + 0.043 + 0.044) / 3 = 0.044

Calculate the cut-off value
Cut off value = NCx + 0.200 = 0.044 + 0.200 = 0.244

Interpretation:

Sample with absorbance greater that or equal to the cut off value are considered reactive to anti-HIV and HIV antigen. Samples with absorbance less than the cut off value are considered non-reactive to anti-HIV and HIV antigen.

DOCUMENTATION:

Paste the print out in the HIV register and also record the following details:
The date on which the test is run.
The name of the kit used.
Lot No and expiry date of the kit.
Initials of the Technologist who performed the test.
Initials of the Supervisor who verifies the result.
The reactive units are marked in red.

STANDARD OPERATING PROCEDURE
HBsAg Testing

Number	Effective date	Page	Author	Authorised by
SOP-14	01/03/2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	Subject
TTI Room	HBsAg Testing
FUNCTION	**DISTRIBUTION**
Sample tested for HBsAg by ELISA method.	- TTI Room - Office Document - Master File

PURPOSE:
To detect the **Hepatitis B surface Antigen** in the donor blood specimen
SCOPE & APPLICATION:
HBsAg is a mandatory test for blood unit screened before it is transfused. This is carried out on all donor units' samples. Anti-HBsAg is bound to the solid phase, the polystyrene microplate well. The test sample is incubated in the antibody-coated well. Through washing with buffer remove unreacted substances and leaves antigen if present attached to the surface of the well. A second antibody labelled with enzyme is then used to react with the trapped antigen. A second washing step removes unreacted enzyme- labelled antibody that is not bound to the antigen. The amount of enzyme left in the well is therefore proportional to the amount of antigen in the test specimen. The final step is testing for enzyme activity using the enzyme substrate. Depending on the enzyme substrate used, the assay may be read visually or quantitated by some optical system e.g. Spectrophotometer or ELISA reader.
RESPONSIBILITY:
It is the responsibility of technician from TTI Testing lab to carry out the test and report as required. The Medical Officer is responsible for cross checking all the test results and the entries in the register.
REFERENCE:
Kit Package inserts.
Technical Manual of American Association of Blood Banks 15th edition 2005.
MATERIALS REQUIRED:
Elisa Reader
Elisa Washer
Incubator
Micropipettes and disposable tips
Timer
Disposable gloves
Disposal container with Na Hypochlorite
Absorbent tissue
Distilled water
Elisa Kit for HBsAg (with microplate , reagents and controls)
Specimen:
5.11.1 Clotted blood / serum sample

PROCEDURE:

6.1 Principle: In the monoclonal EIA procedures microplate wells are coated with monoclonal antibody to Hepatitis B Surface Antigen (Anti HBs) are incubated with serum or plasma and Anti-HBs peroxidase (Horse radish) conjugate in one step assay. During the incubation period HBsAg if present is bound to the conjugate (Anti-HBs-HRPO). Unbound material is aspirated and washed away. On the addition of substrate colour develops in proportion to the amount of HBsAg which is bound. The enzyme reaction is stopped by the addition of stopping solution.

Method: General instructions:

Carry out the test as per manufacturer's instructions given in the package insert.

Remove reagents from the refrigerator 30 minutes prior to testing. Mix the reagents gently by inverting the vials without foaming.

Bring reagents and samples to room temperature before testing.

Arrange all donor unit test tube samples, serially in ascending order in a test tube rack.

Discard all disposable tips into hypochlorite solution.

Place the tray in front of the test tube rack.

PROCEDURE (ELISA HBsAg):

Prepare working Conjugate solution and Washing solution as per requirement.

Use only the number of wells required for the test. Avoid touching the tops or bottoms of the wells. Replace the remaining wells in the provided zip lock pouch and seal it immediately.

Add 50 µl of Negative Control into wells B1 to D1 and 50 µl of the Positive Control into wells E1 and F1 respectively.

Add 50 µl Sample from G1 onwards. Keep the first well as blank which is optional (A1).

Add 50 µl of Conjugate to all wells except blank well.

Cover the wells with adhesive strip(s) and incubate for 60 minutes at 37°+- 1°C.

At the end of the incubation, discard the content of the plate blot the plate dry on absorbent paper.

Fill the well with wash buffer (350µl)and allow to soak for 30 minutes thereafter decant the buffer and blot the plate on absorbent paper. Repeat the step for 4 additional times. (Total 5 washes)

Immediately after washing the plate, add 100 µl of Substance Solution to each well.

Cover the wells with adhesive strip(s) and incubate for 30 minutes in dark at room temperature. A Blue or bluish green colour should develop in wells containing reactive samples.

Add 50 µl of Stop Solution to each well.

Within 15 minutes read the absorbance at 450 nm using 630 nm as the reference wave length

QUALITY CONTROL

The absorbance of the blank should be less than 0.050.

Negative control mean (NCx) should be greater than or equal to 0.000 and less than or equal to 0.100.

Positive control mean should be greater than or equal to 1.000.

If the results are outside the above range, the test should be repeated.

INTERPRETATION OF RESULTS

Calculation of the cut – off value

Calculate the negative control mean (NCx).

Ex negative control 1 absorbance 0.031

Negative control 2 absorbance 0.033

Negative control 3 absorbance 0.032 * negative control mean (NCx)

= (0.031 + 0.033 + 0.032) / 3 = 0.032

Calculate the cut-off value

Cut – off value = NCx + 0.100 = 0.032 + 0.100 = 0.132

Interpretation:

Sample with absorbance equal to or greater than the cut off value are considered reactive to HBsAg. Samples with absorbance less than the cut off value are considered non-reactive to HBsAg.

DOCUMENTATION: Paste the printout in the HBsAg file and also record the following details:

The date on which the test is run.

The name of the kit used.

Lot No. and expiry date of the kit.

Initials of the technologist who performed the test.

Initials of the Supervisor who verifies the result.

Reactive units are marked in red.

Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with components.

STANDARD OPERATING PROCEDURE

Anti-HCV Testing

Number	Effective date	Page	Author	Authorised by
SOP-15	01/03/2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	Subject
TTI Room	Anti-HCV Testing
FUNCTION	**DISTRIBUTION**
Sample tested for Anti HCV antibodies by ELISA method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:

Anti HCV antibodies testing is carried out on all bag samples before these are released for transfusion. Pre-donation samples of Apheresis donors are also tested.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab; to carry out the test and report as required.

MATERIAL REQUIRED:

Elisa Reader

Elisa Washer

Incubator

Micropipettes and disposable tips

Timer

Disposable gloves

Disposal container with Na Hypochlorite

Absorbant tissue

Distilled water

Kit

REFERENCES:

Kit package insert.

Technical Manual of American Association of Blood Banks – 15th Edition, 2005.

PROCEDURE:

Preparation of the reagents

Bring all the reagents to room temperature for 30 minutes before use.

Take the required number of strips from sealed antigen coated microplate, and the remaining strips must be kept at 2-8^{0}C with a silica gel (desiccant) in an aluminium pouch.

Preparation of Washing Solution

Make a 1:20 dilution of Washing Solution with distilled or de-ionized water (to the extent of required amount for example, add 10 ml of concentrated Washing Solution to 190 ml distilled or deionized water) to make 200ml total volume and mix gently . Washing Solution may be crystallized at cool storage condition. If crystallized, use it after thawing at 37^{0}C water-bath maintained at 37^{0}C.

Preparation of Conjugate

Make a 1:51dilution of Conjugate concentrate with Conjugate Diluent 5 to 10 minutes before use (Refer Table 1. Shake well before use.

Table 1.

StripsRequired	1	2	4	6	8	10	12
Conjugate diluents (ml)	1	2	4	6	8	10	12
Concentrated conjugate (µl)	20	40	80	120	160	200	240

Procedure:

Prepare working Conjugate solution and Washing solution as per requirement.

Use only the number of wells required for the test. Avoid touching the tops or bottoms of the wells. Replace the remaining wells in the provided zip lock pouch and seal it immediately.

Add 100 µl of Sample Diluent to each well. Do not add anything in Blank well (A1) (Blank is optional).

Add 10 µl of the Negative Control into each of three wells B1 to D1 and 10 µl of the Positive Controls into wells E1 and F1 respectively.

Add 10 µl of sample from G1 onwards.

Cover the wells with adhesive strip(s) and incubate for 30 minutes at 37^{0}C+- 1^0 C.

At the end of the incubation, discard the content of the plate blot the plate dry on absorbent paper.

Fill the wells with wash buffer (350ul) and allow to soak for 30 seconds thereafter decant the buffer and blot the plate on absorbent paper. Repeat the step for 4 additional times. (Total 5 washes)

Immediately after washing the plate, add 100 µl of Conjugate to all wells except blank (A1).

Cover the wells with adhesive strip(s) and incubate for 30 minutes at 37^{0}C +_ 1^{0}C.

At the end of the incubation time wash the plate as described in step 7 and 8.

Immediately after washing the plate, and 100 µl of Substrate Solution to each well.

Cover the wells with adhesive strip(s) and incubate for 30 minutes in dark at room temperature. A Blue or bluish green colour should develop in wells containing reactive samples.

Add50 µl of Stop Solution to each well.

Within 15 minutes read the absorbance at 450 nm using 630 nm as the reference wavelength.

QUALITY CONTORL

The absorbance of the blank should be less than 0.050.

Absorbance of all the Positive Controls should be greater than or equal to 1.000.

At least two of three Negative Controls should be greater than or equal to 0.000 and less than or equal to 0.100. Even the Negative Control mean (NCx) should be greater than or equal to 0.000 and less than or equal to 0.100.

INTERPRETATION OF RESULTS

Calculation of the cut off value.

Calculate the Negative Control mean (NCx)

Ex) Negative control 1 absorbance = 0.090

Negative control 2 absorbance = 0.085

Negative control 3 absorbance = 0.080

Negative control Mean (NCx) = (0.090 + 0.085 + 0.080) / 3 = 0.085

7.2 Calculate the cut off value

Cut off value = NCx + 0.200 =0.085 + 0.200 = 0.285

INTERPRETATION

Samples with absorbance greater than or equal to the cut off value are considered reactive to anti-HCV. Samples with absorbance less than the cut off value are considered non-reactive to anti-HCV.

DOCUMENTATION: Paste the print out in the HCV register and record the following details

The date on which the test is run.

The name of the kit used.

Lot number and expiry date of the kit.

Initials of the Technologist who performs the test and Supervisor who verifies the results.

The reactive units are marked in red.

Transfer the record to donor records and grouping register.

STANDARD OPERATING PROCEDURE

HIV Rapid Testing

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP-16	01/03/2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	**Subject**
TTI Room	HIV Testing
FUNCTION	**DISTRIBUTION**
Sample tested for HIV by rapid card method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:

HIV is a mandatory test for blood unit screening before it is transfused. This is carried out on all donor units' samples.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab to carry out the test and report as required.

Material Required:

Disposable gloves

Kit with test cards available

Kit insert

Specimen:Clotted blood / serum sample /EDTA specimen

REFERENCES:

Technical Manual of the American Association of Blood Banks – 15th Edition, 2005.

Kit insert.

PROCEDURE:

Assay Procedure

Bring all the reagents and specimens to room temperature (25^0C-30^0C) before beginning the test.

DO NTO HEAT OR REPEATEDLY FREEZE / THAW SPECIMEN.

Place the required number of HIV test devices at the working area.

Tear off the pouch and take out the device for performing the test. Write the sample number to be tested on the device.

TEST PROCEDURE

Allow the test, specimen and control to RT prior to testing

Remove one test card from the pouch and place it on a clean flat surface.

Hold the dropper vertically and add 1 drop of patient's sample (serum or plasma) using the sample dropper provided (use a separate sample dropper for each specimen to be tested).

Add 2 drops of Buffer Solution and read results.

Interpret test results at 15 to 20 minutes. Do not interpret test result beyond 20 minutes.

INTERPRETATION OF RESULTS

NON-REACTIVE:

If only One line (only the Control line) the specimen is non reactive for antibodies either to HIV-1 or HIV-2. Interpret sample as non-reactive.

REACTIVE:

If two lines, one for the control and the other for HIV-1, the specimen is reactive for antibodies to HIV-1.If two lines, one for the control and the other for HIV-2, the specimen is reactive for antibodies to HIV-2.If all the three lines, one each for control, HIV-1 & HIV-2, the specimen is reactive for antibodies to HIV-1 & HIV-2.

INVALID TEST:

If no line appears after the test is complete, either with clear background or with complete pinkish/ purple background the test indicates ERROR. This may indicate a procedural error or deterioration of specimen / reagents or particulate matter in the specimen. The specimen should be re-tested on a new device.

DOCUMENTATION:

The date on which the test is run.

The name of the kit used.

Lot No. and expiry date of the kit.

Initials of the technologist who performed the test.

Initials of the Supervisor who verifies the result.

Reactive units are marked in red.

Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with the components prepared.

STANDARD OPERATING PROCEDURE

HBsAg Rapid Testing

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP-17	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
0	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	**Subject**
TTI Room	HBsAg Testing
FUNCTION	**DISTRIBUTION**
Sample tested for HBsAg by rapid card method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:

HBsAg is a mandatory test for blood unit screening before it is transfused. This is carried out on all donor units' samples.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab to carry out the test and report as required.

MATERIAL REQUIRED:

Disposable gloves

Kit with test cards available

Kit insert

Specimen: Clotted blood / serum sample /EDTA Specimen

REFERENCES:

Technical Manual of the American Association of Blood Banks – 15th Edition, 2005.

Kit insert.

PROCEDURE:

Bring the required number of card foil pouches and specimen to room temperature prior to testing.

Take out card from the foil pouch.

Label the test card with donor number or identification number.

Add 2 drops (50 micro litre) of plasma/ serum specimen into the sample well using the dropper provided (use separate micro tip or dropper for each sample.

Read results at 15 minutes.

INTERPRETATION OF THE RESULTS:

REACTIVE :

Appearance of pink coloured line, one each in test region "T" and controlregion "C" indicates that the sample is REACTIVE for HBsAg.

NON-REACTIVE :

Appearance of one distinct pink line in the control region "C" only, indicates that the sample is "NON REACTIVE" for HBsAg.

INVALID:

When neither control line nor the test lineappears on the membrane,the test should be treated as invalid which maybe because of following reasons:Improper storage at temperature other than the recommended temperature. Wrong procedure.Long atmospheric exposure of the test device after opening the pouch.The test should be repeated using a new card and test sample.

DOCUMENTATION:

The date on which the test is run.

The name of the kit used.

Lot No. and expiry date of the kit.

Initials of the technologist who performed the test.

Initials of the Supervisor who verifies the result.

Reactive units are marked in red.

Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with the components prepared.

STANDARD OPERATING PROCEDURE
HCV Rapid Testing

Number	Effective date	Page	Author	Authorised by
SOP-18	01/03/2020	2	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	Subject
TTI Room	HCV Testing
FUNCTION	**DISTRIBUTION**
Sample tested for HCV by rapid card method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:

HCV is a mandatory test for blood unit screening before it is transfused. This is carried out on all donor units' samples.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab to carry out the test and report as required.

MATERIAL REQUIRED:

Disposable gloves
Test Kit
Kit insert

Specimen: Clotted blood / serum sample /EDTA Specimen.

REFERENCES:

Technical Manual of the American Association of Blood Banks – 15th Edition, 2005.
Kit insert.

PROCEDURE:

Bring all the reagents and specimens to room temperature (20-25°C) before beginning the test,

Place the required number of HCV test devices at the working area.

Cut open the pouch and take out the device for performing the test. Write the sample identification number to be tested on the device for correct correlation with results.

ASSAY PROCEDURE:

Add 1 drop of patient's sample (25 ul) using the sample dropper provided.
Add 2 drops of Buffer Solution.
Read result at 20 minutes.

INTERPRETATION OF RESULTS

NON REACTIVE RESULT

Appearance of only one line at the control region "C" indicates that the sample is NON-REACTIVE for antibodies to HCV.

REACTIVE RESULT:

Appearance of two lines, one at the control region "C" & other at the test region "T1", indicates that the sample is REACTIVE for antibodies to HCV.

INVALID RESULT:

If no line appears after the completion of test, either with clear background or with complete pinkish / purplish background the test indicates ERROR.The specimen should be retested on a fresh device.

DOCUMENTATION:

The date on which the test is run.
The name of the kit used.
Lot No. and expiry date of the kit.
Initials of the technologist who performed the test.
Initials of the Supervisor who verifies the result.
Reactive units are marked in red.

Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with the components prepared.

STANDARD OPERATING PROCEDURE
Malaria Rapid Testing

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP-19	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	**Subject**
TTI Room	Malaria Testing
FUNCTION	**DISTRIBUTION**
Sample tested for malaria by rapid card method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:

Malaria is a serious, sometimes fatal, parasitic disease characterized by fever, chills, and anaemia and is caused by a parasite that is transmitted from one human to another by the bite of infected Anopheles mosquitoes.

RESPONSIBILITY:

It is the responsibility of technician from TTI Testing lab to carry out the test and report as required.

Material Required:

Disposable gloves
Kit with test cards available
Kit insert
Blotting paper

Specimen: Collect the whole blood in a clean container (containing EDTA). Fresh samples are preferred for testing as theyperform best when tested immediately after collection. If samples are notimmediately tested, they should be stored at 2-8 degree Celsius for not more than 3days, otherwise false / erroneous results may be obtained.Haemolysed or clotted sample or sample with microbial contamination shouldnot be used.

REFERENCES:

Technical Manual of the American Association of Blood Banks – 15th Edition, 2005.
Kit insert.

PROCEDURE:

Principle: Utilizes the principle of immunochromatography. As the test sample flows through the membrane assembly of the device after addition of the clearing buffer, the colored colloidal gold conjugates of monoclonal anti-Pf. HRP-2 (lgG) antibody and monoclonal anti Pan specific pLDH antibody complexes the HRP-2 / pLDH in the lysed sample. This complex moves further on the membrane to the test region where it is immobilized by the anti vivax specific pLDH (monoclonal) antibody and /or the monoclonal anti-Pf. HRP-2 (lgM) antibody coated on

the membraneleading to formation of pink-purple colored band/s which confirms a positive test result. A band will appear under Pf at the test region in falciparum positive samples, while a band will appear under Pv in vivax malaria positive samples. Appearance of band under Pf as well as Pv in the test region suggests a mixed infection. Absence of colored band/s in the test region indicates a negative test result. The unreacted conjugate and unbound complex if any, move further on the membrane and are subsequently immobilized by anti rabbit antibodies coated on the membrane at the control region, forming a pink-purple band. The control band formation is based on the 'Rabbit /anti-Rabbit globulin' system. Since it is completely independent of the analyte detection system, it facilitates formation of consistent control band signal independent of the analyte concentration. This control band serves to validate the test performance.

Test Procedure and Interpretation of result

Bring the complete kit and specimen to be tested to room temperature priorto testing.

Remove the test card from the foil pouch prior to use. The test should beperformed immediately after removing the test card from the foil pouch.

Label the test card with donor's number or identification number.

Mix the anti-coagulated blood sample evenly by gentle swirling to make ithomogeneous before use. Add 5 ul of sample into the malaria card. Blot the blood onto the sample pad in thesample well 'A'.

Place the nozzle on Assay Buffer vial as shown in BEFORE YOU START and add 3 drops of the the Assay buffer in the buffer well 'B'.

Allow the reaction to occur for 20 minutes.

Read the result at 20 minutes.

Discard the card immediately after taking result at 20 minutes as it is potentially infectious.

INTERPRETATION OF THE RESULTS

POSITIVE: Appearance of three pink coloured line inP.f. region &Pan region andControl region (C) indicates that the sample is reactive for P. falciparum and Pan, appearance of two pink coloured line one each at Pan& C region only indicates that the sample is reactive for Pan, appearance of two pink coloured line one each at Pf& C region only indicates that the sample is reactive for P. falciparum only.

NEGATIVE: Appearance of only one pink coloured line at Control(C) region indicatesthat the sample is non-reactive for Pan and P. falciparum.

INVALID: The test is invalid, if no line appears after the completion of test, either with clear background or with complete pinkish/ purplish background. The test should be repeated using a new card.

DOCUMENTATION: In the daily worksheet and rapid testing documentation its important to write;

The date on which the test is run.

The name of the kit used.

Lot No. and expiry date of the kit.

Initials of the technologist who performed the test.

Initials of the Supervisor who verifies the result.

Reactive units are marked in red.

Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with the components prepared.

STANDARD OPERATING PROCEDURE
VDRL Rapid Testing

Number	Effective date	Page	Author	Authorised by
SOP-20	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	20-02-2020

Location	Subject
TTI Room	VDRL Testing
FUNCTION	**DISTRIBUTION**
Sample tested for VDRL by rapid card method.	- TTI Room - Office Document - Master File

SCOPE & APPLICATION:
Serological test for syphilis using VDRL carbon antigen.It is qualitative test for screening donor's blood for syphilis. The antigen suspension used in the test must be prepared meticulously before to each run of test from a VDRL, antigen stock.

RESPONSIBILITY:
It is the responsibility of technician from TTI Testing lab to carry out the test and report as required. The Medical Officer is responsible for cross checking all the test results and the entries in the register.

MATERIAL REQUIRED:
Rotator / shaker
Reagent kit
Dispensing dropper with measuring needle
Disposables test cards
Disposable mixing sticks
Insert
Mircopipettes and disposable pipette tips

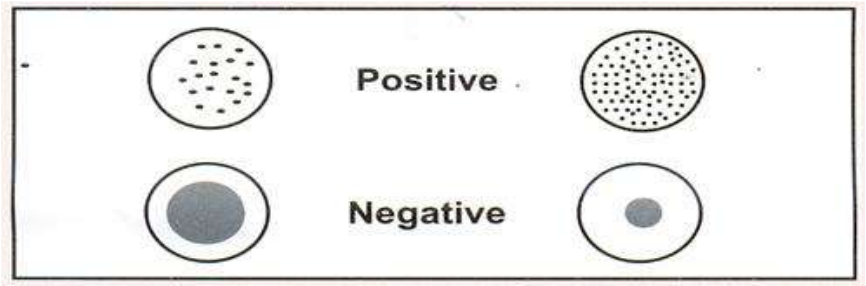
REFERENCE:
Kit Package inserts.
Technical Manual of American Association of Blood Banks 15th edition 2005.

PROCEDURE:
Principle: RPR card test is a qualitative and semi-quantitative screening test for reagent antibody. The test is similar in principle to the classical VDRL test. The reagent used is a modified cardiolipin antigen, coated with microparticulate carbon particles. In addition, it contains a balance quantity of cholesterol and lecithin. In the presence of reagin antibodies, flocculation appears which can be visualised macroscopically.

Method
Dispense50 µl of sample or control on to a circle of the test card using a clean and dry pipette.
To each of this add one drop of RPR Carbon reagent using the needle-dropper.
Using the mixing stick provided, spread the sample over the entire area of the test circle.
Rotate the card for 6 minutes either manually or on a mechanical rotator 100 rpm.
Read the result by visual inspection in good light.

INTERPRETATION OF RESULT:
Positive result (reactive) is indicated by the development of clearly visible clumps of the carbon particles either in the centre or at the edge of the test circle.

Negative result (non-reactive) is indicated when the carbon particles remains in a homogenous suspension in no aggregates are visible.



DOCUMENTATION: Paste the printout in the VDRL file and also record the following details:
The date on which the test is run.
The name of the kit used.
Lot No. and expiry date of the kit.
Initials of the technologist who performed the test.
Initials of the Supervisor who verifies the result.
Reactive units are marked in red.
Transfer the results to TTI register and in case of reactive samples immediately issue instructions or make sure personally to remove the unit along with components.

STANDARD OPERATING PROCEDURE

ABO Blood Typing (CELL & SERUM/PLASMA)

Number	Effective date	Page	Author	Authorised by
SOP/ 21	01.03.2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two year	02	r. Dimple Mehrotra	24.02.2020

Location	Subject
Red Cell Serology Laboratory	ABO Blood Group
FUNCTION	**DISTRIBUTION**
Cell and serum testing by tube method	- Red Cell Serology Laboratory - Master File

PURPOSE:
To determine the ABO blood group.
SCOPE & APPLICATION:
To determine the correct ABO group of an individual and ensure the reliability of the result. This procedure describes the method of detection of ABO antigens on the red cell and the reciprocal antibodies in the serum (Landsteiner's Law). It provides guidance for the use of blood grouping reagents (antisera & standard red cells) in order to detect weak variants, acquired antigens, Bombay (Oh) blood group and irregular red cell antibodies.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the ABO grouping of donors and patients. One technician performs red cell testing and the other serum testing. The results are checked by the supervisor or medical officer. If a discrepancy is encountered in cell and serum grouping, all tests should be repeated by the same technician using anti-A1 and anti-H lectins if required. If the discrepancy persists, the sample should be handed over to the advanced red cell serology laboratory for further workup. It is the responsibility of all staff performing the ABO grouping to ensure that quality controlled reagents and proper cell concentrations are used.

REFERENCE:

Technical Manual of the American Association of Blood Banks, 13 Edition, 1999, pages 150-151, 270, 277-280, 378-379, 285-286, 650-651.

Introduction to Transfusion Medicine, Zarin Bharucha and D.M. Chouhan, 1 edition, 1990. Pages 43-47.

Procedures in Blood Banking and Immunohaematology - H.M. Bhatia, 1977. Pages 13-15.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6 C.

Table top centrifuge.

Microscope.

Specimen:

Clotted and anticoagulated blood samples of donors

Clotted blood sample of patients

Test red cells suspended in native serum/plasma or saline.

Reagents:

Anti A, Anti-B, Anti-AB antisera.

Group A,B and O pooled cells.

0.9% saline.

Distilled water.

Glassware:

Serum tubes

Micro tubes

Pasteur pipettes

Glass slides.

Miscellaneous:

Rubber teats

Disposal box

2 plastic beakers

Aluminium racks to hold sample tubes.

PROCEDURE:

Principle:

ABO system is the only system in which there is a reciprocal relationship between the antigen on the red cells and the naturally occurring antibodies in the serum. Routine grouping of donors and patients must therefore include both RBC and serum tests, each serving as check on the other. The procedure is based on the principle of agglutination of antigen positive red cells in the presence of antibody directed towards the antigen.

RBC Testing:

Label tubes with donor/patient and test identification.

Prepare cell suspension for cells being tested.

Place two drops of anti-A, anti-B and anti-AB reagent in the appropriately labelled tubes.

Add to each tube one drop of 2-5% cell suspension (in normal saline, serum or plasma) of the red cells to be tested.
Mix the contents of the tubes gently and incubate at room temperature for 15 minutes.
Centrifuge at 1000 rpm for 1 minute. (Note: Always follow manufacturer's instructions from package insert)

Serum Testing:

Label tubes with donor-patient and test identification.
Add 2 drops of test serum in all tubes in the corresponding column.
Prepare cells for testing of A, B and O groups by pooling 3 samples of each group.
Add 1 drop of 2% pooled A red cell suspension in tube labelled A/C.
Add 1 drop of 2% pooled B red cell suspension in tube labelled B/C.
Add 1 drop of 2% pooled O red cell suspension in tube labelled O/C.
Mix the contents of the tubes gently and incubate the test for minimum 15 minutes at room temperature.
Centrifuge all tubes at 1000 rpm for 1 minute.
Gently re-suspend the red cell button & examine for agglutination or hemolysis.

RESULTS

Depending on presence (+) or absence (-) of agglutination.
Confirm the cell grouping results with those obtained in serum grouping and vice versa.

INTERPRETATION

Agglutination in any tube of RBC tests and agglutination or haemolysis in serum test constitutes a positive test result. The expected agglutination reaction for positive tests are 3 to 4 '++'.

A smooth suspension of RBCs after resuspension of RBC button is a negative test result. All negative results must be verified under microscope. Cells should be separate without any clumping.

The interpretation of ABO group is as follows:

CELL TYPING			**SERUM TYPING**			**O Results**
Anti-B	**Anti-A**	**Anti-AB**	**A/Cells**	**B/Cells**	**O/Cells**	
-	C	C	-	C/L	-	A
C	-	C	C/L	-	-	B
C	C	C	-	-	-	AB
-	-	-	C/L	C/L	-	O
C – CLUMP &L - LYSIS						

Resolve any discrepancies between cell and serum typing tests before the patient's or donor's ABO group is interpreted.

DOCUMENTATION:

Enter the results of donor grouping in the donor blood grouping register. Enter the results of patients grouping in the patient grouping register and blood group requisition form.

STANDARD OPERATING PROCEDURE

Rh-D BLOOD GROUPING

Number	Effective date	Page	Author	Authorised by
SOP/22	01.03.2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	One Year	04	. Dimple Mehrotra	24.02.2020

Location	Subject
Red Cell Serology Laboratory	Rh D Typing
FUNCTION	**DISTRIBUTION**
Tube test for Rh testing	- Red Cell Serology Laboratory - Requestion Reception Area - Office Document - Master File

PURPOSE:

To determine the Rh blood group.

SCOPE & APPLICATION:

This Standard Operating Procedure (SOP) provides the method to be followed to determine the Rh D type of an individual and ensure the reliability of the result. This procedure describes the method for detection of D antigen on the red Cells. It provides guidance for the use of anti D blood grouping reagent.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the D typing of donors and patients using one monoclonal and one biclonal reagent. If a discrepancy is encountered between the two batches of anti D, the test should be repeated by the same technician. If the discrepancy persists, the sample should be handed over to the advanced red cell serology laboratory for further work up. If results of D typing of a blood donor are negative, the technician should proceed with D typing procedure. It is the responsibility of all staff performing the D typing to ensure that quality controlled reagents and proper cell concentration are used.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 150-151, 307-312, 657-658.
Introduction to Transfusion Medicine; Zarin Bharucha & D.M. Chouhan, 1 edition, 1990. Pages 47-48.
Procedures in Blood banking and Immunohaematology; H.M. Bhatia, 1977, Page 37.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6 C.
Table top centrifuge.
Microscope
Incubator/dri bath

Specimen:

Clotted and anticoagulated blood samples of donors.
Clotted blood sample of patients.
Test red cells suspended in native serum/plasma or saline.

Reagents:

Anti D monoclonal (IgM/IgG blend)
0.9% saline

Distilled water

Glassware:

Serum tubes

Micro tubes

Pasteur pipettes

Glass slides.

Miscellaneous:

Rubber teats Disposal box

Plastic beakers

Aluminium racks to hold tubes

PROCEDURE:

Principle:

Testing with anti-D is necessary to determine if red blood cells possess or lack D blood group antigen. Absence of agglutination is a negative test result, which indicates that the D antigen is not demonstrable. Agglutination of red blood cells with an anti-D reagent is a positive test result, which indicates the presence of the D antigen on the red blood cells.

D-Typing:

Label tubes with patient/unit and test identification.

Prepare cells for testing in accordance with the Preparation of Cell Suspension.

Add one drop of reagent anti-D to the test tube.

Using a pipette, add one drop of the cell suspension to each test tube.

Mix well (incubation temperature and time depends on manufacturer's instructions).

RESULTS:

Centrifuge all tubes at 1000 rpm for 1 minute.

Gently resuspend the red cell button and examine for agglutination.

Grade and record test results.

INTERPRETATION:

Agglutination of the red blood cells in the presence of reagent is a positive test result and indicates the presence of the D antigen.\

A smooth suspension of RBCs after resuspension of RBC button is a negative test result. All negative results must be verified under microscope. Cells should appear separate without any agglutination.

The interpretation of Rh D type is as follows:

ANTI-D	Rh-D Type
VISIBLE CLUMP	+ve (POSITIVE)
NO CLUMP	-ve (NEGATIVE)

Proceed with weak D (Du) TYPING using indirect anti-globulin technique in case of Rh- negative blood donor sample.

DOCUMENTATION:

Enter the result of donor grouping in the donor grouping register. Enter the results of patients grouping in the patient grouping register and blood group requisition.

STANDARD OPERATING PROCEDURE
Preparation of Red Cells Suspension

Number	Effective date	Page	Author	Authorised by
SOP/23	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Preparation of Red Cells Suspension
FUNCTION	**DISTRIBUTION**
o prepare RBC suspension of appropriate concentration for a given test	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:
To prepare the red cells suspensions
SCOPE & APPLICATION:
This procedure applies to all testing that requires red cell suspension preparation..
RESPONSIBILITY:
It is the responsibility of every technician performing a given test to prepare the appropriate red cell suspension. Every morning, the shift duty technician must prepare A, B & O red cell suspension for the day's use.
REFERENCE:
Technical Manual of American Association of Blood Bank, 13 Edition, 1999, Pages 150, 311.
Introduction to Transfusion Medicine; Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Page 262.
MATERIAL REQUIRED:
Equipment:
Calibrated Centrifuge
Specimen:
Clotted or anticoagulated blood specimen of donor.
Clotted or anticoagulated blood specimen of patient.
Donor unit segment..
Reagents:
0.9% saline
Glassware:
Serum tubes
Pasteur pipettes
Miscellaneous:
Discard box
Plastic beakers
Rack to hold tubes..
PROCEDURE:
Principle:

The ratio of serum to red cells may dramatically affect the sensitivity of agglutination tests. Consistent preparation of either 2 to 5% red cell suspension is critical to any agglutination test.

Pooled Cell Suspension:

Label tubes with A,B, and O groups.

Place 1 drop of red cells each from 3 of A group sample tubes or segment into the A labelled tube.

Place 1 drop of red cells each from 3 of B group sample tubes or segment into the A labelled tube.

Place 1 drop of red cells each from 3 of O group sample tubes or segment into the A labelled tube.

Fill the tube ¾ full with 0.9% saline to resuspend the cells.

Centrifuge the tubes for at least 2 to 3 minutes on high speed. Decant the supernatant fluid.

Remove any debris or fibrin with the pipette. Add enough saline to produce a cherry red colour comparable to that of the reagent red cell suspension.

If the colour is too dark, add additional isotonic saline to the tube until the suspension colour is right.

If the colour is too light, repeat steps 6 and 7.

Test the pooled cells prepared using the antisera (anti-A, B, AB and D) in use.

Donor/Patients' sample:

Proceed to use the same procedure to prepare cell suspension of particular donor or patient sample for grouping and crossmatching.

LIMITATIONS:

Haemolysis of the red blood cells from improper washing may result in false results. A cell suspension that is too heavy or too light may produce false positive or false negative results.

DOCUMENTATION:

Enter the donor unit numbers from which pooled cells are prepared in the donor register.

Record the results of testing with the antisera in use.

Enter the manufacturer's name and batch number of the antisera.

STANDARD OPERATING PROCEDURE

Antibody Screening

Number	Effective date	Page	Author	Authorised by
SOP/24	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Antibody Screening
FUNCTION	**DISTRIBUTION**
Detection of Unexpected Blood group Antibodies	Cross match lab Supervisor in charge of Red Cell Serology Laboratory Office Document - Master File

PURPOSE:

To detect the unexpected antibody in donor and patient specimen.

SCOPE & APPLICATION:

This procedure applies to all testing that requires antibody screening, including donor units, patient's pre-transfusion blood grouping and prenatal specimens.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the antibody screen using proper cell concentrations. One technician performs all tests and another checks it. If any unexpected blood group antibody is detected, inform the staff or technical supervisor or medical officer for further investigations.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages, 256-262, 383-384, 392-393, 379, 668-671, 676.

Procedures in Blood Banking & Immunohaematology H.M. Bhatia, 1977, Pages 72-75.

Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition 1990. Pages 51, 58-60, 69-71, 85.).

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2-6^{0}C.

Deep Freezer to store enzyme papine cystein in frozen state.

Tabletop centrifuge.

Automated cell washer (for patient pre-transfusion and prenatal testing).

Microscope.

Dri bath/Incubator

Specimen:

Clotted blood sample of donors/patients.

Reagents:

Group O polled cells/Antibody-screening reagent red blood cells (two or three cells).

Papain cystein.

22% Bovine albumin.

Antihuman globulin reagent (anti-IgG+anti-C3d)

IgG sensitised control cells.

0.9% saline

Distilled water

Glassware:

Serum tubes

Coombs' tubes (for patient pre-transfusion & prenatal testing)

Micro tubes

Pasteur pipettes

Glass slides

Miscellaneous:

Rubber teats

Disposal box

Plastic beaker

Wooden blocks to hold micro tubes

Aluminium racks to hold serum and coombs' tubes.

PROCEDURE:

Principle:

The antibody screen test is used in the detection of unexpected blood group antibodies. In this test, pooled O cells or the antibody-screening reagent red blood cells are combined with serum under investigation. The addition of a potentiating medium enzyme / albumin helps to promote the interaction of red cells and antibodies allowing antibody/antigen reactions to occur. Positive reactions (haemolysis or agglutination) in any tests indicate the presence of allo antibody or auto antibody in the serum.

Antibody Screen:

Label tubes with donor/patient and test identification.

Add two drops of test serum to each tube.

Add 1 drop of papain cystein to all tubes labelled 'enzyme' (if enzyme method is being followed).

To each of the tubes labelled 'saline' or 'enzyme/albumin', add 1 drop of 2% pooled O red cell suspension (or 2% suspension of the antibody-screening reagent red cells).

Add 1 drop of 22% abovine albumin to tubes labelled 'albumin' (if albumin method is being followed).

Add 1 drop of 5% pooled O red cell suspension (or 5% suspension of antibody-screening reagent red cells) to tubes labelled 'IAT', followed by 2 drops of 22% bovine albumin.

Mix the contents of the tubes gently and incubate for minimum 15 minutes.

Test	Incubator Temperature	Incubation Time
Saline	Room Temperature	1 hour
Enzyme	37^0C	45 minutes
Albumin	37^0C	45 minutes
IAT/ICT	37^0C	1 hour
Follow manufacturer's directions when using commercial reagents		

Either enzyme or albumin method may be followed for detection of incomplete antibodies.

Results:

Centrifuge saline, enzyme and albumin tests at 1000 rpm for 1 minute.

Examine for haemolysis.

Gently resuspend the red cell button and examine for agglutination.

Examine all visually negative tests microscopically.

Grade and record test results immediately.

Proceed to perform antiglobulin phase of the indirect antiglobulin test on tubes labelled IAT/ICT.

Wash the cells 3 times with saline. Decant completely after last wash (washing can be done manually or using automated cell washer).

Add 2 drops antihuman globulin reagent to the dry cell button.

Mix well and centrifuge at 1000 rpm for 1 minute.

Read and record results.

Add drop IgG sensitised cells to all negative results. This shows a positive agglutination.

Interpretation:

Hemolysis or agglutination in any test may indicate the presence of an unexpected antibody.

The absence of agglutination and hemolysis in all tests is a negative test result.

After addition of IgG-sensitized cells to a negative test, the presence of agglutination indicates that the AHG serum added was capable of reacting and that the negative antiglobulin test is valid.

If IgG-sensitised cells added to confirm the activity of the anti-IgG show only weak or no agglutination after centrifugation, the test is invalid and must be repeated.

Limitations:

If tests with all reagent red cells are reactive, the possibility of spontaneous agglutination should be considered. A control of cells washed three to four times added to two drops of saline must be non-reactive.

DOCUMENTATION:

Results of donor unit antibody screen are entered in the donor grouping register and computer.

Results of patients antibody screen are entered in the patient grouping register, blood group requisition form, serial case number register and computer.

All records are initialed by the technician who has performed the test and by the technician who has checked the results.

STANDARD OPERATING PROCEDURE

Compatibility Testing

Number	Effective date	Page	Author	Authorised by
SOP/25	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Detection of incompatibility between patient and donor
FUNCTION	**DISTRIBUTION**
Saline/ Enzyme Cross-match	Cross Matcch Laboratory Office Document - Master File

PURPOSE:

This procedure is applied for compatibility testing of all patients requiring transfusion.

SCOPE & APPLICATION:

This procedure applies to compatibility testing of all Multi-transfused patients and transfusion recipients who currently demonstrative or have a history of clinically significant antibodies.

RESPONSIBILITY:

It is the responsibility of the Technician or Medical Technologist in the red cell serology laboratory to perform antoglobulin cross match to using quality control reagents and document the results. If any unexpected antibody is detected, the advanced Red Cell Serological should be informed to carry out further investigation.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 380 381, 383-384, 256-257, 392-393, 667-668.

Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Pages 82-85, 58-59.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2-6 C.

Deep Freezer to store enzyme papine cystein in frozen state.

Tabletop centrifuge.
Automated cell washer (for patient pre-transfusion and prenatal testing).
Microscope.
Water bath.
Specimen: Clotted blood sample of donors/patients.
Reagents:
Group O polled cells/Antibody-screening reagent red blood cells (two or three cells).
Papain cystein.
22% Bovine albumin.
Antihuman globulin reagent (anti-IgG+anti-C3d).
IgG sensitised control cells.
0.9% saline
Distilled water
Glassware:
Serum tubes
Coombs' tubes (for patient pre-transfusion & prenatal testing)
Micro tubes
Pasteur pipettes
Glass slides
Miscellaneous:
Rubber teats
Disposal box
Plastic beakers
Wooden blocks to hold micro tubes
Aluminium racks to hold serum and coombs' tubes
PROCEDURE:
Principle:
The major cross-match is used to detect unexpected blood group antibodies in patient's serum against antigens on donor cells. Positive reaction in any test indicates incompatibility.
Cross-match (procedure):
Label 3 tubes with patient/donor test identification.
Add 2 drops of patient's serum to each tube.
Prepare 5% cell suspension in 0.9% saline from each donor unit segment.
Add 1 drop 5% donor red cell suspension to the tubes containing patient's serum.
Add 1 drop pap-cysteine to tubes labelled enzyme.
Add 1 drop of 22% albumin to the tubes labelled albumin.
Mix the contents of tubes gently and incubate for minimum 15 minutes (Saline tubes at room temperature and Enzyme / Album at 37^0C).
Centrifuge the tubes at 1000 rpm for 1 minute.
Examine for hemolysis.
Gently resuspend red cell button and examine for agglutination.
Examine all visually negative reactions under microscope.
Grade and record test results immediately. 13. Let a second technician check the results.
Interpretation:
Hemolysis or agglutination in any test indicates incompatibility.
Absence of hemolysis / agglutination in all tests indicates compatibility.
Limitations: The saline / enzyme cross match will not:
Detect error in Rh typing

Prevent isoimmunisation of the recipient
Ensure normal red blood cell survival
Detect some weakly reactive antibodies

DOCUMENTATION:

Enter results in cross-match register and compatibility report form. All records are signed by technician who performed the test and counter signed by Medical Doctor who has checked the results.

STANDARD OPERATING PROCEDURE

Antiglobulin Cross-match

Number	Effective date	Page	Author	Authorised by
SOP/26	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Antiglobulin Cross-match
FUNCTION	**DISTRIBUTION**
ection of incompatibilities caused by warm complete antibodies	Cross match lab Supervisor in charge of Red Cell Serology Laboratory Office Document - Master File

PURPOSE:

To perform Antiglobulin Cross-match

SCOPE & APPLICATION:

This procedure applies to compatibility testing of all multi-transfused patients and transfusion recipients who currently demonstrate or have a history of clinically significant antibodies.

RESPONSIBILITY:

It is the responsibility of the technician in the cross match facility of the red cell serology laboratory to perform the anti-globulin cross match using quality controlled reagents and proper cell concentrations. One technician performs the tests and another checks it. If any unexpected blood group antibody is detected, inform to technical supervisor or medical officer to carry out further investigations.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 380-381, 383-384, 258-262, 668-671.
Procedures in Blood Banking and Immunohaematoology; H.M. Bhatia, 1977. Pages 72-75.
Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Pages 69-71, 74-76, 85..

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2- 6^0C.
Table top centrifuge
Automated Cell Washer. \

Microscope
Dri bath.

Specimen:

Clotted blood sample of patient
Segment from donor unit
Donor red cells suspended in saline

Reagents:

22% bovine albumin
Antihuman globulin reagent (anti-IgG+anti-C3d)
IgG sensitised control cells
0.9% Saline
Distilled water

Glassware:

Serum tubes
Coombs' tubes
Pasteur pipettes
Glass slides

Miscellaneous:

Rubber teats
Disposal box
Plastic beakers
Aluminium racks to hold serum and coombs' tubes..

PROCEDURE:

Principle:

The cross match through the anti-globulin phase permits detection of clinically significant incompatibilities caused by incomplete antibodies that sensitise cells at 0 37 C, but do not directly cause agglutination.

Anti-Globulin Cross-Match:

Label tube with patient/unit and test identification.
Add two drops of patient serum to each tube.
Prepare a 5% cell suspension in saline from each donor unit segment. (Sp015).
Add 1 drop of donor's 5% red cell suspension to the tube.
Add 2 drops of 22% bovine albumin and mix well.
Incubate at 37 C for minimum 15 minutes. (Follow manufacturer's directions when using commercial reagents).
Wash the cells a minimum of 3 times with saline. Decant completely after last wash (washing can be done manually or in automated cell washer).
Add two drops of antihuman globulin reagent to the dry cell button.
Mix well and centrifuge at 1000 rpm for 1 minute.
Resuspend and read for agglutination. Grade and record test results immediately.
To all negative antiglobulin tests add 1 drop of IgG-sensitised control cells. Centrifuge, resuspend and read for agglutination. Grade and record test results. After the addition of IgG-sensitised control cells to a negative test, the presence of agglutination indicates that the AHG serum added was capable of reacting and that the negative antiglobulin test is valid.

Interpretation:

Hemolysis or agglutination indicates the presence of a serologically incompatible cross-match. This result is interpreted as Incombatible.
Absence of agglutination and hemolysis is a negative test result and indicates a serologically compatible crossmatch. This result is interpreted as **Combatible**. If the IgG-sensitised control cells added to confirm the activity of the polyspecific reagent show only weak or no agglutination the test is invalid and must be repeated.

LIMITATIONS: The anti-globulin cross- match will not:
Detect error in Rh typing.
Prevent isoimmunisation of the recipient.
Ensure normal red blood cell survival.
Detect some weakly reactive antibodies.

DOCUMENTATION:
Enter all results on the transfusion record card and OT/Ward transfusion register. Enter only the results of compatible units in the blood compatibility form. The technician who performed the test and the one who checked the results sign all records

STANDARD OPERATING PROCEDURE

Investigation of Transfusion Reaction

Number	Effective date	Page	Author	Authorised by
SOP/27	01/03/2020	05	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Investigation of Transfusion Reaction
FUNCTION	**DISTRIBUTION**
To identify cause of transfusion reaction	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:
To identify cause of transfusion reaction.

SCOPE & APPLICATION:
This Standard Operating Procedure (SOP) provides the protocol to be followed to identify the cause of an adverse transfusion reaction and prevent its reoccurrence.

RESPONSIBILITY:
It is responsibility of the technician in the Cross Match Laboratory to accept the blood/component implicated in the transfusion reaction which is returned from the ward/OT. It is the duty of the same technician to ensure that there is documented evidence of the nature of reaction either on the transfusion request form or on a separate letter addressed to blood bank, along with the post-transfusion blood sample (both EDTA and clotted) and urine specimen, if necessary. The direct antiglobulin test (DAT) should be performed on the post-transfusion EDTA sample immediately on receipt before refrigeration. The unit and samples should be preserved properly and handed over to the advanced red cell serology technician who is responsible for detail investigation.

REFERENCE:
Introduction to Transfusion Medicine: Zarin Bharucha and D.M. Chouhan 1 Edition, 1990. Pages 216-219.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6^0C.
Deep Freezer to store enzyme papain-cystein in frozen state.
Table Top Centrifuge
Automated Cell washer
Microscope
Dri bath / Incubator.

Specimen:

Blood/component bag returned room ward/OT.
Patient's pre-transfusion blood sample (clotted)
Patient's post-transfusion blood sample (EDTA and clotted)
Patient's post-transfusion urine sample.

Reagents:

ANTI-a, Anti-B, Anti-AB Antisera.
Group A,B &O pooled cells
Papain-cystein / 22% Bovine albumin
Antihuman globulin reagent (anti-IgG anti-C3d)
IgG Sensitised Control Cells
0.9% Saline
Distilled water
30g/l sulfosalicylic acid solution
Ammonium Sulphate (NH4(so4)2).

Glassware:

Serum tubes
Coombs' tubes (for patient grouping only)
Micro tubes
Pasteur pipettes
Glass slides
Small funnel
20ml test tubes
5ml pipette

Miscellaneous:

Rubber teats.
Disposal box.
2 plastic beakers
Wooden block to hold micro tubes
Aluminium racks to hold serum and coombs' tubes.
Whatmen No.1 filter paper
5ml plastic vial with screw cap

PROCEDURE:

Principle:

Red Cell Serological tests are based on the principle of agglutination and help to identify haemolytic transfusion reactions caused either by ABO incompatible transfusion or irregular red cell antibodies in patient's blood. Leuco-agglutinations, if present are detected by agglutination of random donor leucocytes in cases of febrile transfusion reaction. Serum bilirubin total and indirect are raised in case of haemolysis.

The sulfosalicylic acid test helps to differentiate between haemoglobin and non-protein pigment, probably porphyrin in the urine. The ammonium sulphate precipitation test is based on the fact that haemoglobin and myoglobin are precipitated in urine at different degrees of ammonium sulphate saturation.. **Serological tests:**

Perform a direct antiglobulin test (DAT) on post-transfusion EDTA sample before refrigeration immediately on receipt. If test is positive, perform DAT on pre-transfusion sample to verify whether sensitisation is due to transfusion or it pre-existed. Repeat grouping and antibody screening of patient's pre-transfusion sample.

Repeat grouping and antibody screening of patient's post-transfusion sample.

Repeat grouping and antibody screening of donor sample.

Repeat grouping of unit from bag. In case of packed cell unit, do only cell grouping. In case of FFP, do only serum grouping.

Repeat crossmatching of donor with patient's pre and post transfusion samples using saline / enzyme / IAT. Use donor cells from blood bag and not the pilot tube..

Leucocyte Antibody Test:

6.2.1 In case of febrile transfusion reaction and hypotension, look for leukocyte antibodies

Bio-chemical tests:

Note colour of plasma. Plasma is pink, if haemoglobin is present and icteric if bilirubin is present.

Separate the patient's pre and post transfusion serum and send to biochemistry department in a 5 ml screw cap plastic vial bearing the date, patient and test identification for estimation of serum bilirubin total, direct and indirect and estimation of plasma hemoglobin.

Send the biochemistry request form with proper entries along with the sample.

Collect the report from biochemistry lab.

Tests on post-transfusion urine sample:

Red colour indicates haematuria or haemaglobinuria.

Add 3ml of 30g/l solution of sulfosalicylic acid to 1 ml urine. Mix well and filter

No precipitate Filter retains colors Precipitate Formed

Colour Pigment is a protein

Non protein pigment is probably porphyrin

Add 2 8 g NG4 4 (SO)2 to 5 ml urine (=80% saturation)

Filter is clear precipitate is colored

Filter retain color colour Precipitate is coloured Haemoglobin/Myoglobin

Microbiology:

Send the donor unit for smear and culture (at 37^0C, room temperature and 4^0C) to bacteriology department.

Make proper entries in the bacteriology despatch book and bacteriology request form and send along with the unit.

Collect the report from bacteriology lab.

If donor unit reveals bacteremia, then request the attending doctor to get the patient's blood culture done and report the findings to the blood bank officer.

Interpretation:

Any red cell incompatibility found during the investigation explains a haemolytic transfusion reaction.

The DAT will be positive and a mixed field reaction will be seen if in vivo sensitisation of transfused red cell has occurred.

The DAT may be negative even in cases of haemolytic transfusion reaction, if the cell destruction is severe.

If any antibody is detected in patient's serum, the donor cells should be positive for the corresponding antigen.

Detection of leucoagglutination explains a febrile reaction or hypotension.

Serum bilirubin total and indirect are raised in case of haemolysis.

Haemoglobinemic and haemoglobinuric are highly suggestive of red cell destruction, but are not necessarily caused by antigen-antibody reaction, unless confirmed.

Limitations: The non serologic possibilities of haemoglobinemia and haemoglobinuria are:-

Hemolysis of blood before transfusion.

Poor technique of collecting post transfusion sample.
Myoglobinuria following major surgery.
Infusion of distilled water during prostatectomy.
Hemolysis due to artificial valve.
Patient's clinical condition; autoimmune haemolytic anemia or paroxysmal nocturnal hemoglobinuria.
Use of glucose or dextrose through the same line before starting blood.
Addition of certain drugs to blood such as ethacrynic acid, hydrocortisone or diphenyl hydantoin.

DOCUMENTATION:

Enter the transfusion reaction in blood issue register, showing date and time of return of the unit and nature of reaction.
Enter the DAT/IAT results in the Antiglobulin test book in the red cell serology laboratory.
Document the results of the entire investigations in the Transfusion Reaction work up form.
Keep record in the Transfusion Reaction Record Register in advanced red cell serology laboratory.

STANDARD OPERATING PROCEDURE

Inventory of Blood Bags and Blood Components

Number	Effective date	Page	Author	Authorised by
SOP/28	01-03-2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dimple Mehrotra	24-02-2020

Location	Subject
Storage Area	Inventory of Blood Bags and Blood Components
FUNCTION	**DISTRIBUTION**
Availability of Blood for Transfusion	- Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

For availability of Blood for Transfusion.

SCOPE & APPLICATION:

In order to avoid outdating and make optimum use of available blood, it is important to maintain a day to day inventory of tested blood which helps selection of blood to be cross matched for patients requiring transfusion.

RESPONSIBILITY:

The technician from the component laboratory checks the records and transfers all the units which are serologically negative and labelled to inventory.

REFERENCE:

Technical Manual of American Association of blood banks 13 Edition, 1999. Pages 83-84, 86.

MATERIAL REQUIRED:

Inventory registery

PROCEDURE:

Inventory is maintained on a day to day basis. After labelling the units, enter the numbers of whole blood or packed cells numbers group wise on the right hand page of the inventory register kept in the main red cell laboratory. In case of packed cells units, write the alphabet “PC” above the unit number. PC denotes packed cells

without additive solutions. PCS denotes packed cells with additive solution. The inventory bears columns for A group, B group, AB group, O group as well as negative groups of these four groups.
Enter the units group wise and according to the date of collection in the inventory register (daily stock). The technologist on night duty is responsible for physical checking of the printed number tag with the hand written number on the label and enters in the inventory.
After labeling the FFP, enter the donor units numbers group wise in the stock register of FFP similar to blood units.
Enter FVIII Deficient Plasma units labeled group wise in the stock register similar to plasma register.
Enter the labeled cryoprecipitate unit numbers in the register.
Clearly mark the inventory of bags that have less volume of blood collected or are reserved for specific patients with specific instructions.

DOCUMENTATION:
All unit numbers are entered group wise and expiry date wise in the inventory register

STANDARD OPERATING PROCEDURE

Issuance of Blood and Blood Products

Number	Effective date	Page	Author	Authorised by
SOP/29	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Due Counter and Cross match Laboratory	Supply of Safe Blood for transfusion
FUNCTION	**DISTRIBUTION**
Reissue of Blood &Blood Components	- Technologist in charge of Issue Counter - Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:
To Issue of blood and blood components..
SCOPE & APPLICATION:
The technologists have the duty to see that the blood is not wasted and made available to another patient of the same group. This is achieved by first-in-first-out (FIFO) policy..
RESPONSIBILITY:
It is the responsibility of the staff to see that the blood which has returned and not used is once again cross matched and made safe for transfusion to another patient.
REFERENCE:
Technical Manuel of the American Association of Blood Banks 13 Edition, 1999. Pages 186, 491, 10.
MATERIAL REQUIRED:
Issue Register
Inventory Register
PROCEDURE:

When blood is released from the Blood Bank to operation theatre or ward of the hospital or outside for transfusion, some times for some reason or the other, it may not be required by the patient and it is returned to the blood bank. If this unit of blood or blood component arrives within half an hour, it could be reused for another patient. Take care to see that this unit of blood is kept erect in the cold room to look out for hemolysis. If there is no hemolysis seen after spinning or standing, issue this unit safely to another patient.

In case of FFP, which comes to the blood bank unused, issue to another patient if there is a demand for that particular group immediately within 6 hours of the first issue. If no call arises, then use it later as FVIII deficient plasma..

DOCUMENTATION:

Make entries of returned units against the issue in the issue register.

Re-enter the unit in the inventory before reissue.

STANDARD OPERATING PROCEDURE

Optimum Utilization of Blood

Number	Effective date	Page	Author	Authorised by
SOP/30	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	01-05-2018

Location	Subject
Issue Counter	Issue of blood for transfusion
FUNCTION	**DISTRIBUTION**
Optimum utilisation of blood	- Technologist in charge of Issue Counter - Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

To Issue of blood and blood components for transfusion.

SCOPE & APPLICATION:

The blood and blood components are used as per the need of the patients. These are issued against the prescription of a medical officer after ensuring the compatibility and testing results.

RESPONSIBILITY:

It is the responsibility of the technician on shift duty in Red Cell Laboratory to issue the blood for which requisition is received.

REFERENCE:

Model STANDARD OPERATING PROCEDURES for BLOOD TRANSFUSION SERVICE BLOOD TRANSFUSION SERVICE World Health Organization New Delhi,SP,027.

MATERIAL REQUIRED:

Issue register
Inventory register
Request form
Compatibility report

PROCEDURE:

In order to avoid outdating, implement FIFO policy.

Carry out compatibility testing using SP/15.
Ensure that the compatible units are tested for TTI and found suitable for use.
Remove the correct unit from blood bank refrigerator and keep it in the thermal box for transport.
Make entries in the issue register.
Instruct the individual to take the unit straight to OT/Ward for transfusion.

DOCUMENTATION:

Make following entries in issue register.
Name of patient
Hospital registration number
Blood group
Date and time of issue
Unit No. issued
Blood group of unit
Component of blood
Signature of technician who issues
Signature of receiver.

STANDARD OPERATING PROCEDURE

Labelling of Blood and Blood Components

Number	Effective date	Page	Author	Authorised by
SOP/31	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Storage Area	Labelling of Blood Bags and Blood Components
FUNCTION	**DISTRIBUTION**
Ensure safe Transfusion	- Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

To check the quality of antisera.

SCOPE & APPLICATION:

The blood after collection, it is released for transfusion only after all tests (grouping and for TTI) are completed. Before these blood bags are taken on inventory for use they are labelled depending on their blood groups. The label is required for identification and retrieval of blood units for use, disposal and follow up in case of adverse reactions.

RESPONSIBILITY:

It is the responsibility of the technician from the collection and component section to label the blood and blood components units.

REFERENCE:

Technical manual of the American Association of Blood Banks - 13 edition, 1999 Pgs. 156-158.

MATERIAL REQUIRED:

Pre-printed adhesive labels for all components printed as per regulatory requirement.
The labels are printed and colour coded for all components as per blood groups. Group A have yellow labels, Group B pink labels, Group O blue labels and Group AB have white labels. Negative labels also have the same colour labels except the printing is in red colour.

PROCEDURE:

After collection and processing whole blood and component units remain in quarantine storage areas.

Once all the reports of blood group and TTI testing are ready, place the bags on a table in chronological order.

Segregate those which are found reactive for any TTI or found unsuitable for use and keep them in the area for disposal. Leave those found suitable for use on the bench for labelling.

Write clearly the unit number, date of collection and expiry and the volume on each label as per the grouping register records.

Date of collection and date of expiry is very important. The expiry date depends on the type of bag and component. In case of a triple and quadruple bag with additive solution, the expiry date is 42 days, and for double and single bags, it is 35 days. In case of a triple or quadruple bag if for some reason, the components could not be separated, then label the expiry date as 21 or 35 days depending on the anticoagulant present in the primary bag. The day of blood collection is considered the day zero for calculating the expiry dates.

After the bags are labelled ask a second technician to double check the number and group on the bags tallying them with the records.

Enter all labelled bags group wise in the stock book which is also maintained group wise. In the stock book keep a footnote for any autologous blood that is reserved for the patient's own use.

Lable FFP and Cryo deficient plasma, and platelet concentrates in the same manner. Cryoprecipitate labels do not indicate blood groups.

All plasma components have an expiry date of one year. The expiry date of platelet concentrate is 3 days with PVC bags and 5 days if special bags are in use.

DOCUMENTATION:

Enter all labelled bag numbers in the inventory of units for use.

STANDARD OPERATING PROCEDURE

Preservation of Blood and Blood Components

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/32	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	. Dimple Mehrotra	24-02-2020

Location	**Subject**
Storage Area	Preservation of Blood and Blood Components
FUNCTION	**DISTRIBUTION**
Optimum Storage of Blood and Blood Components	- Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

To Preservation of Blood and Blood Components.

SCOPE & APPLICATION:

Blood components prepared are stored in conditions designed to preserve optimal viability and function during the storage period.

RESPONSIBILITY:

It is the responsibility of the technical staff from the component laboratory to keep the units in the quarantine storage. The technologist who labels the units after the testing is responsible to transfer the labelled units in their respective storage areas.

REFERENCE:

Technical Manual of American Association of Blood Banks 13 Edition, 1999. Pages 166-167, 182-183, 84, 86.
Introduction to Transfusion Medicine, Zarin Bharucha & D.M. Chauhan, 1 Edition, 1990, Pages 111-112..

MATERIAL REQUIRED:

Storage Equipment
Blood bank Refrigerator
Deep Freezer
Platelet incubator
Platelet agitator.

PROCEDURE:

All untested units should be kept in the quarantine area.

After testing is over, release the fully tested. Transfer those deemed suitable for clinical use from quarantine area to the stock area after labelling.

Label those found unsuitable for use with a biohazard label and keep for disposal.

Store whole blood and Red Cell concentrates on metal rack stand in the Cold Room (4-6º C). These stands have shelves. Each shelf is reserved for a particular group having its label stuck on the outer side. Arrange the blood bags in chronological order, group wise and according to the expiry dates in trays and then stack the trays on the shelves. This makes it very easy for the technologists on duty to remove the bags for issuing, whenever required.

Store blood collected in CPD-A1 and the red cells separated in a closed system up to 35 days. Store the red cells suspended in additive solutions up to 42 days. Use red cells prepared in open system within 24 hours of preparation.

Keep Fresh Frozen Plasma, cryoprecipitate and FVIII deficient plasma bags in over wrap bags and then arrange in plastic trays in the Deep Freezer (-40ºC) immediately after separation. The shelf life of all these plasma components is 1 year. FFP once thawed and then refrozen is used only as FVIII deficient plasma.

Place Random donor platelets (RDP), Single Donor Platelets (SDP) in a platelet incubator at 20-22ºC on a agitator which has shelves to store them. Store the concentrates prepared in PVC bags up to 3 days and those prepared in special platelet bags up to 5 days.

Take due care to maintain sterility of all components by keeping all storage areas clean.

Monitor to ensure the storage conditions to be appropriate and correct for each product. Monitor the temperature of all storage areas with continuous graphic recorder. Change the charts every week, and achieve them. Check the alarm system every month.

Similarly, after labelling the plasma bags, enter the unit numbers group wise in the stock register. Make FFP entries on the right hand page of the stock register, whereas Factor VIII-D plasma & Cryo units on the left hand page. Carry out physical stock taking every night and rewrite the inventory.

Products	PCV/WB	FFP	Cryo	PRP/RDP/SDP
Temp	2-6ºC	30ºC to -80º C	-30ºC	22ºC with gentle agitation
Shelf Life	35 days (42 days SAGM)	One year	One year	Days

DOCUMENTATION:

Record all blood/components released for use as well as the unsuitable units to be discarded in the disposal register.

STANDARD OPERATING PROCEDURE
Quality Control of Antisera

Number	Effective date	Page	Author	Authorised by
SOP/33	01-03-2020	03	Yogesh Kumar	Dr. Gajender Singh
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01	Two Year	03	Dimple Mehrotra	24-02-2020

Location	Subject
Quality Control	To ensure reliability and reproductivity of blood group results
FUNCTION	**DISTRIBUTION**
Daily Quality Control of ABO &Rh Blood Group reagents	- Quality Control Lab - Office Document - Master File

PURPOSE:
To check the quality of antisera.
SCOPE & APPLICATION:
This Standard Operating Procedure (SOP) provides the daily checks on blood group reagents to ensure reliability and reproducibility of blood group results.
RESPONSIBILITY:
It is the responsibility of the technician / technical supervisor in the quality control laboratory to ensure that quality controlled reagents and proper cell concentrations are used for testing for which daily quality control checks and test controls are used with proper documentation. The reagents should be stored and used as per manufacturer's instruction. Any fault in the reagents should be immediately reported to the **Medical Officer**.
REFERENCE:
Technical Manual of the American Association of Blood Banks 13 edition 1999, Page 22.
Introduction to Transfusion Medicine Zarin Bharucha and D.M. Chouhan; 1 Edition, 1990. Pages 225-226.
MATERIAL REQUIRED:
Equipment:
Refrigerator to store samples and reagents at 2- 6ºC.
Table Top Centrifuge
Automated Cell washer
Microscope
Reagents:
Anti-A, Anti-B, Anti-AB, Anti D (Monoclonal and Bioclone) Antisera.
Clotted or anticoagulated blood samples of random blood donors.
Group A,B and O pooled Cells.
0.9% saline.
Glassware:
Serum tubes and glass slides
Micro tubes
Pasteur pipettes
Miscellaneous:
Rubber teats.
Disposal box.
2 plastic beakers

Wooden block to hold micro tubes
Aluminium racks to hold serum and coombs' tubes

PROCEDURE:

Principle:

Test for reactivity and specificity is based on the principle of agglutination of antigen positive red cells in the presence of antibody directed towards the antigen.

Quality control checks:

Visual Inspection:

Examine each vial carefully for precipitate, gel formation, turbidity or change in colour..

Reactivity and Specificity:

Add one drop of 3 5% suspension of the appropriate red cells to the onedrop of antiserum in a microtube.
Mix well and incubate (as per manufacturer's instruction).

Note the reactions as under:

	RED CELLS FOR TESTING	
	Positive Reactors	**Negative Reactors**
Anti-A	Pooled A Cells	Pooled B, Pooled O Cells
Anti-B	Pooled B Cells	Pooled A, Pooled O Cells
Anti-AB	Pooled A, Pooled B Cells	Pooled O Cells
Anti-D	RhD- positive (any ABO group)	RhD- negative (any ABO group)

Results:

Visual Inspection:

Record presence or absence of precipitate, gel formation, turbidity or colour change.

Reactivity and Specificity:

Centrifuge the Tubes (as per manufacturer's instruction).
Resuspend the red cell button and examine for agglutination / haemolysis.
Grade and record test results.

Interpretation:

Visual Inspection:

The presence of precipitate, gel formation, turbidity, colour change indicates that the reagent is contaminated and should not be used.
The absence of all the above indicates that the reagent is 'clear' and suitable for use.

Reactivity and Specificity:

Agglutination of specific red cells is a positive reaction and indicates the reactivity of the corresponding antibody in the reagent. The expected agglutination reaction for positive test is +3 to +4.
The absence of agglutination / haemolysis is considered to be a negative reaction and indicates the absence of the corresponding antibody specificity in the reagent.
Clear cut negative reactions with the negative reactors rules out the presence of irregular agglutinins and haemolysis in the reagent.

DOCUMENTATION:

Enter the results in the Blood Group Register in the Red Cell Serology Laboratory. Enter identification number of the individual donor cells used for pooling and the reaction strengths. Sign the results as the individual preparing the pooled cells and testing the reagent.

STANDARD OPERATING PROCEDURE
PREPARATION OF BLOOD COMPONENTS

Number	Effective date	Page	Author	Authorised by
SOP/34	01.03.2020	05	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	2 years	03	r. Dimple Mehrotra	24.02.2020

Location	Subject
Component Laboratory	Blood Component Separation
FUNCTION	**DISTRIBUTION**
ethod for separation of blood components	- Supervisor-in-Charge of Component Laboratory - Office Document - Master File

Purpose:
Preparation of different blood components.

SCOPE & APPLICATION:
For judicious use of blood, it is necessary to use the components as per the need rather than using whole blood. From the whole blood collected in double bags, packed cells and FFP or F-VIII deficient plasma are separated. From triple bags packed cells, FFP and platelets or packed cells, F-VIII deficient plasma and cryoprecipitate are separated. When the plasma frozen at 80ºC is thawed at 4ºC, a cryoglobulin remains as a precipitate which is called cryoprecipitate. It contains mainly F-VIII and fibrinogen.

RESPONSIBILITY:
It is the responsibility of the component room technician to separate components from whole blood collected in multiple bags.

Equipment & Material Required:
Tube sealer
Laminar flow
Refrigerated centrifuge
Plasma expresser
Electronic weighing scale
Double pan weighing balance
Cryoprecipitate thawing bath
Double bags (350ml) or triple bags with SAGM solution (450ml)
Manuals of all equipment for reference regarding use and maintenance of each equipment

REFERENCE:
Technical Manual of American Association of Blood Banks 13 edition 1999 Pgs 26, 168-170, 172-173,177, 716-717, 723-726.
Introduction to Transfusion Medicine - Zarin Bharucha & D.M. Chouhan 1 edition 1990 Pg 124-125

PROCEDURE:
Preparation of packed cells and FFP or FVIII deficient plasma using double bags:
Keep the units vertical on the laminar flow table for 30 to 45 minutes (Process all units within 6 hours of blood collection).
Keep the bags in the buckets and balance them. Keep the equally balanced buckets with bags diagonally opposite in the refrigerated centrifuge ensuring that the position of the bags in buckets is parallel to the direction of the spin.
After centrifugation, gently remove the bags from the bucket and place them on the expresser stand under the laminar flow. Break the integral seal of the tube connecting it to the satellite bag/s manually and express the

supernatant plasma into the satellite bag. In case of double bag, leave 50- 60ml of plasma back along with the red cells in the primary bag and this component is Packed Red Cells (PC).

Label the plasma in the satellite bag, as Fresh Frozen Plasma (FFP) if 0 separated within 6 hours of collection and stored immediately below 30ºC.

If plasma is separated after 6 hours of collection label as Factor VIII deficient plasma (FVIIID).

Cut the segment of FFP and F-VIII bags short.

Preparation of packed cells, platelet concentrates and FFP using triple bags with or without additive solution:

Process the blood collected within 6 hours.

Keep the bags erect on the laminar flow for 30-45 minutes.

Note the weight of the primary bag and record in the register.

Balance the bags in the buckets using dry rubber or unused bags.

Keep equally balanced buckets diagonally opposite each other in the refrigerated centrifuge.

Position the bags in buckets parallel to the direction of the spin. Centrifuge the bags at 3500 rpm for 10 minutes at 4ºC.

Keep the bag on the separator on the laminar flow. Break the seal of the tubing connecting to the satellite bag. And express the plasma into the satellite bag leaving 50-60 ml plasma along with the red cells. (If the bag Page 3 of 5 with additive solution is used, remove all plasma in satellite bag before clamping).

Remove the clamp of the bag containing additive solution and let the additive solution slowly pass into the primary bag containing red cells.

Mix the contents thoroughly and seal the tubing and detach the bags.

Keep the primary bag containing packed cells with additive solution in quarantine storage in the blood bank refrigerator kept in the component room.

Label the bag and take it on the inventory after the testing is over.

Spin the satellite bag containing platelet rich plasma (PRP) and connecting bag from which additive solution was emptied, at 22ºC in refrigerated centrifuge at 500 rpm for 10 minutes after balancing the buckets.

Place the bag containing PRP on the expresser stand.

Express the plasma into the empty bag leaving 50-60 ml plasma along with the platelets.

Seal the tubing and cut the tubing of the plasma bag short (1") to avoid breakage during frozen storage.

A small segment of tube containing platelets (about 8 cms long) is prepared after mixing of the bag contents as and when requested by quality control laboratory.

Leave the platelet concentrates on the laminar flow for 30 minutes, keeping the label side down. Mix the contents of the bag manually before 0 transferring the units to quarantine storage in the incubator at 22 C on the lower shelf.

After the required test results are available place the platelet concentrates on the agitator in the upper shelf for use.

Keep the plasma bag in the quarantine storage in the deep freezer kept in the component room and transfer to deep freezer in issue area when the tests are completed after labelling and entering in the inventory.

(Standardise the speed of the centrifuge as it depends on the type of bag, the amount of blood collected and centrifuge in use).

Preparation of Cryoprecipitate:

The basic material is platelet poor fresh frozen plasma. The plasma should be free of red cell. Use the plasma frozen at 80ºC preferably within a day or two of freezing.

Keep the segment of the bags for potential cryo-preparation longer.

Fill the cryobath with double distilled water.

Maintain the temperature of water in continuous circular motion at 9ºC.

Keep the frozen plasma bags in this cryobath. When the plasma is thawed, place the bags in centrifuge buckets and balance the buckets on weighing scale.

Keep the position of the bags in buckets parallel.

Spin the buckets at 5000 rpm for 15 minutes at 4ºC .

Under laminar flow, conect empty transfer bag to the bag containing plasma and cryoprecipitate using sterile connecting device.
Place the plasma bag on expresser and separate plasma into the transfer b a g leaving approximately 15-25 ml as cryoprecipitate suspension in the original bag.
Seal the tubing and separate the cryoprecipitate and the cryopoor plasma bags.
Weight the cryo and plasma bags and record.
The plasma separated is F-VIII deficient plasma. Both the bags are kept in quarantine till the tests are completed.
Label, enter the inventory and place them in deep freezer in issue area after test results are available.

Washed Packed Red Cell

Undertake the washing procedure only after the compatibility test is over.
If a single bag is used for blood collection attach a transfer bag using sterile connecting device.
Balance the blood bag in the centrifuge bucket with another empty bucket.
Spin the bag at 3500 rpm for 10 minutes at 4ºC.
Remove the supernatant plasma completely in a transfer bag using expresser under laminar flow.
(Before washing the unit, red cell serology laboratory should perform the compatibility tests. The washing procedure is undertaken only after the proposed unit is found to be compatible with recipient).
The proposed blood unit is balanced in the centrifuge bucket with another empty bucket. The buckets are centrifuged as per programme.
The bag is removed and supernatant plasma is completely removed in a transfer bag using an expresser under laminar flow.
Connect the bag with a sterile 0.9% saline bag using a transfer set.
Record batch number and expiry dates of saline in use.
Introduce approximately 200 ml of saline into the packed cell bag and mix thoroughly and centrifuge again.
Transfer the supernatant saline with some plasma into a transfer bag using the expresser under laminar flow.
Disconnect the transfer bag, seal and discard.
Repeat the washing with saline twice more (total three times) exactly in the same manner as described above. In the end keep 25-30ml saline with the red cells in the bag.
Seal the final thrice washed red cell unit.
Weigh the bag and record details in the register.
Store the washed packed red cell unit at 1-6ºC and use within 24 hours of washing.
Use this blood only for the patient for which requested. If not used discard after 24 hours with standard disposal protocol, after subjecting small sample for bacteriological examination.

DOCUMENTATION:

Enter following details in the Component Register
Date and time of separation.
Unit number.
Type of bag used, with batch number and manufacturer's name.
Weights of whole blood and different components.
Date of expiry of different components.
Type of centrifuge and speed used.
Blood group and serology code.
Enter in stock register of red cells, FFP and platelets after the testing is completed and the units are labelled.
Incident reporting: If there are any problems encountered during the component processing enter the incident report form and inform the supervisor / medical officer in charge.Record the volume of stock and working solution prepared on the register.

STANDARD OPERATING PROCEDURE

Autoclaving

Number	Effective date	Page	Author	Authorised by
SOP/35	01.03.2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	02	r. Dimple Mehrotra	24.02.2020

Location	Subject
Sterilization cum washing room	Autoclaving
FUNCTION	**DISTRIBUTION**
Autoclaving of Blood units	- Sterilization cum washing room - Master File

Purpose:

This procedure covers the correct handling, treatment by autoclaving, and disposal of filled blood bags that have been discarded as waste.

Scope & Application:

Blood bags are used for collecting blood donated for transfusing patients. Once rejected for use (contaminated, incorrect typing, TTI rective or positive or expired), the bags blood will need to be treated prior to disposal to reduce any potential for infection. The discarded filled blood bags will need to be disinfected prior to disposal, to prevent the spread of disease. If blood is known to be contaminated, it will require disinfection prior to disposal and autoclaving is the recommended treatment method. Because blood bags are usually made from the chlorinated plastic PVC (polyvinyl chloride), they should not be incinerated, due to the generation of dioxins and furans during the burning process. These toxic compounds cause cancers even in low concentrations. In addition, where the incineration devices are basic, the burning bags may leak, which will create a hazard in the vicinity of the incinerator. Autoclaving is the preferred option for treatment of blood bags.

Responsibility:

This is the responsibility of all personnel who are trained and authorized to handle discarded blood bags.

All training must be documented, updated regularly and filed by the responsible person.

The department manager is responsible for: Ensuring that waste blood bags are responsibly handled and treated, prior to disposal and that action is taken to solve any reported problems.

Reference:

Chitnis V, Chitnis S, Patil S, Chitnis D. Treatment of discarded blood units: Disinfection with hypochlorite/formalin versus steam sterilization. Indian Journal of Medical Microbiology, 2003;21(4):265.

United Nations Development Programme–Global Environment Facility (UNDP–GEF), Global Healthcare Waste Project. Guidance on the microbiological challenge testing of healthcare waste treatment autoclaves. New York (NY): UNDP–GEF; 2010. 9 p.

http://gefmedwaste.org/downloads/Guidance%20on%20Microbiological%20Challenge%20

Testing%20for%20Medical%20Waste%20Autoclaves-%20November%202010.pdf

Perkins JJ. Principles and methods of sterilization in health sciences. 2nd ed. Charles C Thomas Pub Ltd; 2008. P. 477-478.

Material for Autoclaving:

Autoclave – for disinfecting waste blood in bags.

Access to the drain for disposal of any residual or expired, clean blood.

Labeled containers for storing waste blood bags at the place where they are used.

Reusable autoclave containers in which to place blood bags or packs, to contain and liquid that may leak from ruptured bags.

Clotted and anticoagulated blood samples of donors and patients

Hazards and Safety Concerns:

Always wear appropriate PPE

PROCEDURE:

Preparing for treatment:

For blood bags with contaminated contents or those considered potentially infectious, ensure all the liquid and the containers are sent for autoclaving to disinfect them prior to disposal.

For blood bags with an attached needle, once the blood bag is ready to be discarded.

Tie a knot in the tubing above the needle.

Drain the blood in the tube back into the bag, using a pen or other suitable device, rolling it along the tube to move the blood.

Cut the needle off the pack and dispose of it in the waste sharps container.

Loading the blood bags in the autoclave.

Observe display to ensure it reads "0 temperature and 0 in press.

Check and fill the reservoir with deionized water to the fill line (see manufacturer's instructions).

Load items into the autoclave chamber per manufacturer's specifications.

Items to be sterilized are loaded into the autoclave in a manner so that nothing touches the inside of the chamber. Items should be placed into an autoclavable tray on a shelf or rack and never placed directly on the autoclave chamber bottom or floor.

DO NOT OVERLOAD. Leave sufficient room for steam circulation.

Items to be sterilized should be placed into the autoclave so that steam can uniformly flow between items and so that no air pockets are formed between or around them.

Check the drain screen to make sure that it is not plugged or obstructed.

Close door and turn wheel clockwise until display changes from "Door Unlocked" to "Time:" then tighten down wheel a minimum of two additional turns.

Set the appropriate program for time, temperature and pressure. Temperature of the materials reaches 121°C and 15 pounds per square inch (PSI). It can be variable with minimum of 15 minutes.

Check the desired parameters and then press cycle "ON".

Unloading:

Do not attempt to open the door while the autoclave is operating. Observe display to ensure the pressure reads "Complete V=0 in Hg."

Turn door wheel counterclockwise until display reads "Door Unlocked." Slowly open the door and only slightly for about 10 minutes to allow steam to escape.

Keep your head, face and hands away from the opening.

After 10 minutes, open the door completely and allow the materials inside the autoclave to cool for at least 10 minutes before unloading the autoclave.

Discarding autoclaved blood:

Autoclaved blood can either be: Discarded with other solid waste or directly into a placenta pit, septic tank or bio-digester (not if accessed via drains or pipes) or macerated and discharged to a closed drain connected to a treatment system.

Results:

The number or mass of blood bags autoclaved should be included in the autoclave operation log.

Any incidents, including needles remaining on waste blood bags must be reported to the department manager for action.

Report any incidents or accidents, such as spills and needle stick injuries, according to standard institutional procedures. Where prescribed by local legal requirements, the relevant authorities must be notified of any incidents, such as needle stick injuries.

Documentation:

9.1 Incident Log book
9.2 Autoclave Operation Log
9.3 On-site Treatment and Disposal Of Blood Transfusion Products Guidance
9.4 Autoclave Operation — SOP

STANDARD OPERATING PROCEDURE

ABO Blood Typing (CELL & SERUM/PLASMA)

Number	Effective date	Page	Author	Authorised by
SOP/ 21	01.03.2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two year	02	r. Dimple Mehrotra	24.02.2020

Location	Subject
Red Cell Serology Laboratory	ABO Blood Group
FUNCTION	**DISTRIBUTION**
Cell and serum testing by tube method	- Red Cell Serology Laboratory - Master File

PURPOSE:

To determine the ABO blood group.

SCOPE & APPLICATION:

To determine the correct ABO group of an individual and ensure the reliability of the result. This procedure describes the method of detection of ABO antigens on the red cell and the reciprocal antibodies in the serum (Landsteiner's Law). It provides guidance for the use of blood grouping reagents (antisera & standard red cells) in order to detect weak variants, acquired antigens, Bombay (Oh) blood group and irregular red cell antibodies.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the ABO grouping of donors and patients. One technician performs red cell testing and the other serum testing. The results are checked by the supervisor or medical officer. If a discrepancy is encountered in cell and serum grouping, all tests should be repeated by the same technician using anti-A1 and anti-H lectins if required. If the discrepancy persists, the sample should be handed over to the advanced red cell serology laboratory for further workup. It is the responsibility of all staff performing the ABO grouping to ensure that quality controlled reagents and proper cell concentrations are used.

REFERENCE:

Technical Manual of the American Association of Blood Banks, 13 Edition, 1999, pages 150-151, 270, 277-280, 378-379, 285-286, 650-651.
Introduction to Transfusion Medicine, Zarin Bharucha and D.M. Chouhan, 1 edition, 1990. Pages 43-47.
Procedures in Blood Banking and Immunohaematology - H.M. Bhatia, 1977. Pages 13-15.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6 C.
Table top centrifuge.
Microscope.

Specimen:

Clotted and anticoagulated blood samples of donors
Clotted blood sample of patients
Test red cells suspended in native serum/plasma or saline.

Reagents:

Anti A, Anti-B, Anti-AB antisera.
Group A,B and O pooled cells.
0.9% saline.
Distilled water.

Glassware:

Serum tubes
Micro tubes
Pasteur pipettes
Glass slides.

Miscellaneous:

Rubber teats
Disposal box
2 plastic beakers
Aluminium racks to hold sample tubes.

PROCEDURE:

Principle:

ABO system is the only system in which there is a reciprocal relationship between the antigen on the red cells and the naturally occurring antibodies in the serum. Routine grouping of donors and patients must therefore include both RBC and serum tests, each serving as check on the other. The procedure is based on the principle of agglutination of antigen positive red cells in the presence of antibody directed towards the antigen.

RBC Testing:

Label tubes with donor/patient and test identification.
Prepare cell suspension for cells being tested.
Place two drops of anti-A, anti-B and anti-AB reagent in the appropriately labelled tubes.
Add to each tube one drop of 2-5% cell suspension (in normal saline, serum or plasma) of the red cells to be tested.
Mix the contents of the tubes gently and incubate at room temperature for 15 minutes.
Centrifuge at 1000 rpm for 1 minute. (Note: Always follow manufacturer's instructions from package insert)

Serum Testing:

Label tubes with donor-patient and test identification.
Add 2 drops of test serum in all tubes in the corresponding column.
Prepare cells for testing of A, B and O groups by pooling 3 samples of each group.
Add 1 drop of 2% pooled A red cell suspension in tube labelled A/C.
Add 1 drop of 2% pooled B red cell suspension in tube labelled B/C.

Add 1 drop of 2% pooled O red cell suspension in tube labelled O/C.
Mix the contents of the tubes gently and incubate the test for minimum 15 minutes at room temperature.
Centrifuge all tubes at 1000 rpm for 1 minute.
Gently re-suspend the red cell button & examine for agglutination or hemolysis.

RESULTS

Depending on presence (+) or absence (-) of agglutination.
Confirm the cell grouping results with those obtained in serum grouping and vice versa.

INTERPRETATION

Agglutination in any tube of RBC tests and agglutination or haemolysis in serum test constitutes a positive test result. The expected agglutination reaction for positive tests are 3 to 4 '++'.
A smooth suspension of RBCs after resuspension of RBC button is a negative test result. All negative results must be verified under microscope. Cells should be separate without any clumping.
The interpretation of ABO group is as follows:

CELL TYPING			SERUM TYPING			ABO
Anti-B	**Anti-A**	**Anti-AB**	**A/Cells**	**B/Cells**	**O/Cells**	**Results**
-	C	C	-	C/L	-	A
C	-	C	C/L	-	-	B
C	C	C	-	-	-	AB
-	-	-	C/L	C/L	-	O
C – CLUMP &L - LYSIS						

Resolve any discrepancies between cell and serum typing tests before the patient's or donor's ABO group is interpreted.

DOCUMENTATION:

Enter the results of donor grouping in the donor blood grouping register. Enter the results of patients grouping in the patient grouping register and blood group requisition form.

STANDARD OPERATING PROCEDURE
Rh-D BLOOD GROUPING

Number	Effective date	Page	Author	Authorised by
SOP/22	01.03.2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	One Year	04	Dimple Mehrotra	24.02.2020

Location	Subject
Red Cell Serology Laboratory	Rh D Typing
FUNCTION	**DISTRIBUTION**
Tube test for Rh testing	- Red Cell Serology Laboratory - Requestion Reception Area - Office Document - Master File

PURPOSE:

To determine the Rh blood group.

SCOPE & APPLICATION:

This Standard Operating Procedure (SOP) provides the method to be followed to determine the Rh D type of an individual and ensure the reliability of the result. This procedure describes the method for detection of D antigen on the red Cells. It provides guidance for the use of anti D blood grouping reagent.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the D typing of donors and patients using one monoclonal and one biclonal reagent. If a discrepancy is encountered between the two batches of anti D, the test should be repeated by the same technician. If the discrepancy persists, the sample should be handed over to the advanced red cell serology laboratory for further work up. If results of D typing of a blood donor are negative, the technician should proceed with D typing procedure. It is the responsibility of all staff performing the D typing to ensure that quality controlled reagents and proper cell concentration are used.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 150-151, 307-312, 657-658.

Introduction to Transfusion Medicine; Zarin Bharucha & D.M. Chouhan, 1 edition, 1990. Pages 47-48.

Procedures in Blood banking and Immunohaematology; H.M. Bhatia, 1977, Page 37.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6 C.

Table top centrifuge.

Microscope

Incubator/dri bath

Specimen:

Clotted and anticoagulated blood samples of donors.

Clotted blood sample of patients.

Test red cells suspended in native serum/plasma or saline.

Reagents:

Anti D monoclonal (IgM/IgG blend)

0.9% saline

Distilled water

Glassware:

Serum tubes

Micro tubes

Pasteur pipettes

Glass slides.

Miscellaneous:

Rubber teats Disposal box

Plastic beakers

Aluminium racks to hold tubes

PROCEDURE:

Principle:

Testing with anti-D is necessary to determine if red blood cells possess or lack D blood group antigen. Absence of agglutination is a negative test result, which indicates that the D antigen is not demonstrable. Agglutination of red blood cells with an anti-D reagent is a positive test result, which indicates the presence of the D antigen on the red blood cells.

D-Typing:

Label tubes with patient/unit and test identification.

Prepare cells for testing in accordance with the Preparation of Cell Suspension.

Add one drop of reagent anti-D to the test tube.

Using a pipette, add one drop of the cell suspension to each test tube.

Mix well (incubation temperature and time depends on manufacturer's instructions).

RESULTS:

Centrifuge all tubes at 1000 rpm for 1 minute.

Gently resuspend the red cell button and examine for agglutination.

Grade and record test results.

INTERPRETATION:

Agglutination of the red blood cells in the presence of reagent is a positive test result and indicates the presence of the D antigen.\

A smooth suspension of RBCs after resuspension of RBC button is a negative test result. All negative results must be verified under microscope. Cells should appear separate without any agglutination.

The interpretation of Rh D type is as follows:

ANTI-D	Rh-D Type
VISIBLE CLUMP	+ve (POSITIVE)
NO CLUMP	-ve (NEGATIVE)

Proceed with weak D (Du) TYPING using indirect anti-globulin technique in case of Rh- negative blood donor sample.

DOCUMENTATION:

Enter the result of donor grouping in the donor grouping register. Enter the results of patients grouping in the patient grouping register and blood group requisition.

STANDARD OPERATING PROCEDURE

Preparation of Red Cells Suspension

Number	Effective date	Page	Author	Authorised by
SOP/23	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	. Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Preparation of Red Cells Suspension
FUNCTION	**DISTRIBUTION**
To prepare RBC suspension of appropriate concentration for a given test	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:

To prepare the red cells suspensions

SCOPE & APPLICATION:

This procedure applies to all testing that requires red cell suspension preparation..

RESPONSIBILITY:

It is the responsibility of every technician performing a given test to prepare the appropriate red cell suspension. Every morning, the shift duty technician must prepare A, B & O red cell suspension for the day's use.

REFERENCE:

Technical Manual of American Association of Blood Bank, 13 Edition, 1999, Pages 150, 311.
Introduction to Transfusion Medicine; Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Page 262.

MATERIAL REQUIRED:

Equipment:

Calibrated Centrifuge

Specimen:

Clotted or anticoagulated blood specimen of donor.
Clotted or anticoagulated blood specimen of patient.
Donor unit segment..

Reagents:

0.9% saline

Glassware:

Serum tubes
Pasteur pipettes

Miscellaneous:

Discard box
Plastic beakers
Rack to hold tubes..

PROCEDURE:

Principle:

The ratio of serum to red cells may dramatically affect the sensitivity of agglutination tests. Consistent preparation of either 2 to 5% red cell suspension is critical to any agglutination test.

Pooled Cell Suspension:

Label tubes with A,B, and O groups.
Place 1 drop of red cells each from 3 of A group sample tubes or segment into the A labelled tube.
Place 1 drop of red cells each from 3 of B group sample tubes or segment into the A labelled tube.
Place 1 drop of red cells each from 3 of O group sample tubes or segment into the A labelled tube.

Fill the tube ¾ full with 0.9% saline to resuspend the cells.
Centrifuge the tubes for at least 2 to 3 minutes on high speed. Decant the supernatant fluid.
Remove any debris or fibrin with the pipette. Add enough saline to produce a cherry red colour comparable to that of the reagent red cell suspension.
If the colour is too dark, add additional isotonic saline to the tube until the suspension colour is right.
If the colour is too light, repeat steps 6 and 7.
Test the pooled cells prepared using the antisera (anti-A, B, AB and D) in use.

Donor/Patients' sample:

Proceed to use the same procedure to prepare cell suspension of particular donor or patient sample for grouping and crossmatching.

LIMITATIONS:

Haemolysis of the red blood cells from improper washing may result in false results. A cell suspension that is too heavy or too light may produce false positive or false negative results.

DOCUMENTATION:

Enter the donor unit numbers from which pooled cells are prepared in the donor register.
Record the results of testing with the antisera in use.
Enter the manufacturer's name and batch number of the antisera.

STANDARD OPERATING PROCEDURE

Antibody Screening

Number	Effective date	Page	Author	Authorised by
SOP/24	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Antibody Screening
FUNCTION	**DISTRIBUTION**
Detection of Unexpected Blood group Antibodies	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:

To detect the unexpected antibody in donor and patient specimen.

SCOPE & APPLICATION:

This procedure applies to all testing that requires antibody screening, including donor units, patient's pre-transfusion blood grouping and prenatal specimens.

RESPONSIBILITY:

It is the responsibility of the technician/supervisor in the red cell serology laboratory to perform the antibody screen using proper cell concentrations. One technician performs all tests and another checks it. If any unexpected blood group antibody is detected, inform the staff or technical supervisor or medical officer for further investigations.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages, 256-262, 383-384, 392-393, 379, 668-671, 676.
Procedures in Blood Banking & Immunohaematology H.M. Bhatia, 1977, Pages 72-75.

Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition 1990. Pages 51, 58-60, 69-71, 85.).

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2-6ºC.
Deep Freezer to store enzyme papine cystein in frozen state.
Tabletop centrifuge.
Automated cell washer (for patient pre-transfusion and prenatal testing).
Microscope.
Dri bath/Incubator

Specimen:

Clotted blood sample of donors/patients.

Reagents:

Group O polled cells/Antibody-screening reagent red blood cells (two or three cells).
Papain cystein.
22% Bovine albumin.
Antihuman globulin reagent (anti-IgG+anti-C3d)
IgG sensitised control cells.
0.9% saline
Distilled water

Glassware:

Serum tubes
Coombs' tubes (for patient pre-transfusion & prenatal testing)
Micro tubes
Pasteur pipettes
Glass slides

Miscellaneous:

Rubber teats
Disposal box
Plastic beaker
Wooden blocks to hold micro tubes
Aluminium racks to hold serum and coombs' tubes.

PROCEDURE:

Principle:

The antibody screen test is used in the detection of unexpected blood group antibodies. In this test, pooled O cells or the antibody-screening reagent red blood cells are combined with serum under investigation. The addition of a potentiating medium enzyme / albumin helps to promote the interaction of red cells and antibodies allowing antibody/antigen reactions to occur. Positive reactions (haemolysis or agglutination) in any tests indicate the presence of allo antibody or auto antibody in the serum.

Antibody Screen:

Label tubes with donor/patient and test identification.
Add two drops of test serum to each tube.
Add 1 drop of papain cystein to all tubes labelled 'enzyme' (if enzyme method is being followed).
To each of the tubes labelled 'saline' or 'enzyme/albumin', add 1 drop of 2% pooled O red cell suspension (or 2% suspension of the antibody-screening reagent red cells).
Add 1 drop of 22% abovine albumin to tubes labelled 'albumin' (if albumin method is being followed).
Add 1 drop of 5% pooled O red cell suspension (or 5% suspension of antibody-screening reagent red cells) to tubes labelled 'IAT', followed by 2 drops of 22% bovine albumin.
Mix the contents of the tubes gently and incubate for minimum 15 minutes.

Test	Incubator Temperature	Incubation Time
Saline	Room Temperature	1 hour
Enzyme	37ºC	45 minutes
Albumin	37ºC	45 minutes
IAT/ICT	37ºC	1 hour
Follow manufacturer's directions when using commercial reagents		

Either enzyme or albumin method may be followed for detection of incomplete antibodies.

Results:

Centrifuge saline, enzyme and albumin tests at 1000 rpm for 1 minute.

Examine for haemolysis.

Gently resuspend the red cell button and examine for agglutination.

Examine all visually negative tests microscopically.

Grade and record test results immediately.

Proceed to perform antiglobulin phase of the indirect antiglobulin test on tubes labelled IAT/ICT.

Wash the cells 3 times with saline. Decant completely after last wash (washing can be done manually or using automated cell washer).

Add 2 drops antihuman globulin reagent to the dry cell button.

Mix well and centrifuge at 1000 rpm for 1 minute.

Read and record results.

Add drop IgG sensitised cells to all negative results. This shows a positive agglutination.

Interpretation:

Hemolysis or agglutination in any test may indicate the presence of an unexpected antibody.

The absence of agglutination and hemolysis in all tests is a negative test result.

After addition of IgG-sensitized cells to a negative test, the presence of agglutination indicates that the AHG serum added was capable of reacting and that the negative antiglobulin test is valid.

If IgG-sensitised cells added to confirm the activity of the anti-IgG show only weak or no agglutination after centrifugation, the test is invalid and must be repeated.

Limitations:

If tests with all reagent red cells are reactive, the possibility of spontaneous agglutination should be considered. A control of cells washed three to four times added to two drops of saline must be non-reactive.

DOCUMENTATION:

Results of donor unit antibody screen are entered in the donor grouping register and computer.

Results of patients antibody screen are entered in the patient grouping register, blood group requisition form, serial case number register and computer.

All records are initialled by the technician who has performed the test and by the technician who has checked the results.

STANDARD OPERATING PROCEDURE

Compatibility Testing

Number	Effective date	Page	Author	Authorised by
SOP/25	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Detection of incompatibility between patient and donor
FUNCTION	**DISTRIBUTION**
Saline/ Enzyme Cross-match	- Cross Matcch Laboratory - Office Document - Master File

PURPOSE:

This procedure is applied for compatibility testing of all patients requiring transfusion.

SCOPE & APPLICATION:

This procedure applies to compatibility testing of all Multi-transfused patients and transfusion recipients who currently demonstrative or have a history of clinically significant antibodies.

RESPONSIBILITY:

It is the responsibility of the Technician or Medical Technologist in the red cell serology laboratory to perform antoglobulin cross match to using quality control reagents and document the results. If any unexpected antibody is detected, the advanced Red Cell Serological should be informed to carry out further investigation.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 380 381, 383-384, 256-257, 392-393, 667-668.

Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Pages 82-85, 58-59.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2-6 C.

Deep Freezer to store enzyme papine cystein in frozen state.

Tabletop centrifuge.

Automated cell washer (for patient pre-transfusion and prenatal testing).

Microscope.

Water bath.

Specimen: Clotted blood sample of donors/patients.

Reagents:

Group O polled cells/Antibody-screening reagent red blood cells (two or three cells).
Papain cystein.
22% Bovine albumin.
Antihuman globulin reagent (anti-IgG+anti-C3d).
IgG sensitised control cells.
0.9% saline
Distilled water

Glassware:

Serum tubes
Coombs' tubes (for patient pre-transfusion & prenatal testing)
Micro tubes
Pasteur pipettes
Glass slides

Miscellaneous:

Rubber teats
Disposal box
Plastic beakers
Wooden blocks to hold micro tubes
Aluminium racks to hold serum and coombs' tubes

PROCEDURE:

Principle:

The major cross-match is used to detect unexpected blood group antibodies in patient's serum against antigens on donor cells. Positive reaction in any test indicates incompatibility.

Cross-match (procedure):

Label 3 tubes with patient/donor test identification.
Add 2 drops of patient's serum to each tube.
Prepare 5% cell suspension in 0.9% saline from each donor unit segment.
Add 1 drop 5% donor red cell suspension to the tubes containing patient's serum.
Add 1 drop pap-cysteine to tubes labelled enzyme.
Add 1 drop of 22% albumin to the tubes labelled albumin.
Mix the contents of tubes gently and incubate for minimum 15 minutes (Saline tubes at room temperature and Enzyme / Album at 37ºC).
Centrifuge the tubes at 1000 rpm for 1 minute.
Examine for hemolysis.
Gently resuspend red cell button and examine for agglutination.
Examine all visually negative reactions under microscope.
Grade and record test results immediately. 13. Let a second technician check the results.

Interpretation:

Hemolysis or agglutination in any test indicates incompatibility.
Absence of hemolysis / agglutination in all tests indicates compatibility.

Limitations: The saline / enzyme cross match will not:

Detect error in Rh typing
Prevent isoimmunisation of the recipient
Ensure normal red blood cell survival
Detect some weakly reactive antibodies

DOCUMENTATION:

Enter results in cross-match register and compatibility report form. All records are signed by technician who performed the test and counter signed by Medical Doctor who has checked the results.

STANDARD OPERATING PROCEDURE

Antiglobulin Cross-match

Number	Effective date	Page	Author	Authorised by
SOP/26	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Antiglobulin Cross-match
FUNCTION	**DISTRIBUTION**
Detection of incompatibilities caused by warm complete antibodies	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:

To perform Antiglobulin Cross-match

SCOPE & APPLICATION:

This procedure applies to compatibility testing of all multi-transfused patients and transfusion recipients who currently demonstrate or have a history of clinically significant antibodies.

RESPONSIBILITY:

It is the responsibility of the technician in the cross match facility of the red cell serology laboratory to perform the anti-globulin cross match using quality controlled reagents and proper cell concentrations. One technician performs the tests and another checks it. If any unexpected blood group antibody is detected, inform to technical supervisor or medical officer to carry out further investigations.

REFERENCE:

Technical Manual of the American Association of Blood Banks 13 Edition, 1999. Pages 380-381, 383-384, 258-262, 668-671.

Procedures in Blood Banking and Immunohaematoology; H.M. Bhatia, 1977. Pages 72-75.

Introduction to Transfusion Medicine Zarin Bharucha & D.M. Chouhan, 1 Edition, 1990. Pages 69-71, 74-76, 85..

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples & reagents at 2- 6ºC.

Table top centrifuge

Automated Cell Washer. \

Microscope

Dri bath.

Specimen:

Clotted blood sample of patient

Segment from donor unit

Donor red cells suspended in saline

Reagents:

22% bovine albumin
Antihuman globulin reagent (anti-IgG+anti-C3d)
IgG sensitised control cells
0.9% Saline
Distilled water

Glassware:

Serum tubes
Coombs' tubes
Pasteur pipettes
Glass slides

Miscellaneous:

Rubber teats
Disposal box
Plastic beakers
Aluminium racks to hold serum and coombs' tubes..

PROCEDURE:

Principle:

The cross match through the anti-globulin phase permits detection of clinically significant incompatibilities caused by incomplete antibodies that sensitise cells at 0 37 C, but do not directly cause agglutination.

Anti-Globulin Cross-Match:

Label tube with patient/unit and test identification.
Add two drops of patient serum to each tube.
Prepare a 5% cell suspension in saline from each donor unit segment. (Sp015).
Add 1 drop of donor's 5% red cell suspension to the tube.
Add 2 drops of 22% bovine albumin and mix well.
Incubate at 37 C for minimum 15 minutes. (Follow manufacturer's directions when using commercial reagents).
Wash the cells a minimum of 3 times with saline. Decant completely after last wash (washing can be done manually or in automated cell washer).
Add two drops of antihuman globulin reagent to the dry cell button.
Mix well and centrifuge at 1000 rpm for 1 minute.
Resuspend and read for agglutination. Grade and record test results immediately.
To all negative antiglobulin tests add 1 drop of IgG-sensitised control cells. Centrifuge, resuspend and read for agglutination. Grade and record test results. After the addition of IgG-sensitised control cells to a negative test, the presence of agglutination indicates that the AHG serum added was capable of reacting and that the negative antiglobulin test is valid.

Interpretation:

Hemolysis or agglutination indicates the presence of a serologically incompatible cross-match. This result is interpreted as Incombatible.
Absence of agglutination and hemolysis is a negative test result and indicates a serologically compatible crossmatch. This result is interpreted as **Combatible**. If the IgG-sensitised control cells added to confirm the activity of the polyspecific reagent show only weak or no agglutination the test is invalid and must be repeated.

LIMITATIONS:

The anti-globulin cross- match will not:
Detect error in Rh typing.
Prevent isoimmunisation of the recipient.
Ensure normal red blood cell survival.
Detect some weakly reactive antibodies.

DOCUMENTATION:

Enter all results on the transfusion record card and OT/Ward transfusion register. Enter only the results of compatible units in the blood compatibility form. The technician who performed the test and the one who checked the results sign all records

STANDARD OPERATING PROCEDURE

Investigation of Transfusion Reaction

Number	Effective date	Page	Author	Authorised by
SOP/27	01/03/2020	05	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Cross Match Laboratory	Investigation of Transfusion Reaction
FUNCTION	**DISTRIBUTION**
To identify cause of transfusion reaction	- Cross match lab - Supervisor in charge of Red Cell Serology Laboratory - Office Document - Master File

PURPOSE:

To identify cause of transfusion reaction.

SCOPE & APPLICATION:

This Standard Operating Procedure (SOP) provides the protocol to be followed to identify the cause of an adverse transfusion reaction and prevent its reoccurrence.

RESPONSIBILITY:

It is responsibility of the technician in the Cross Match Laboratory to accept the blood/component implicated in the transfusion reaction which is returned from the ward/OT. It is the duty of the same technician to ensure that there is documented evidence of the nature of reaction either on the transfusion request form or on a separate letter addressed to blood bank, along with the post-transfusion blood sample (both EDTA and clotted) and urine specimen, if necessary. The direct antiglobulin test (DAT) should be performed on the post-transfusion EDTA sample immediately on receipt before refrigeration. The unit and samples should be preserved properly and handed over to the advanced red cell serology technician who is responsible for detail investigation.

REFERENCE:

Introduction to Transfusion Medicine: Zarin Bharucha and D.M. Chouhan 1 Edition, 1990. Pages 216-219.

MATERIAL REQUIRED:

Equipment:

Refrigerator to store samples and reagents at 2- 6ºC.

Deep Freezer to store enzyme papain-cystein in frozen state.

Table Top Centrifuge

Automated Cell washer

Microscope

Dri bath / Incubator.

Specimen:

Blood/component bag returned room ward/OT.
Patient's pre-transfusion blood sample (clotted)
Patient's post-transfusion blood sample (EDTA and clotted)
Patient's post-transfusion urine sample.

Reagents:

ANTI-a, Anti-B, Anti-AB Antisera.
Group A,B &O pooled cells
Papain-cystein / 22% Bovine albumin
Antihuman globulin reagent (anti-IgG anti-C3d)
IgG Sensitised Control Cells
0.9% Saline
Distilled water
30g/l sulfosalicylic acid solution
Ammonium Sulphate (NH4(so4)2).

Glassware:

Serum tubes
Coombs' tubes (for patient grouping only)
Micro tubes
Pasteur pipettes
Glass slides
Small funnel
20ml test tubes
5ml pipette

Miscellaneous:

Rubber teats.
Disposal box.
2 plastic beakers
Wooden block to hold micro tubes
Aluminium racks to hold serum and coombs' tubes.
Whatmen No.1 filter paper
5ml plastic vial with screw cap

PROCEDURE:

Principle:

Red Cell Serological tests are based on the principle of agglutination and help to identify haemolytic transfusion reactions caused either by ABO incompatible transfusion or irregular red cell antibodies in patient's blood. Leuco-agglutinations, if present are detected by agglutination of random donor leucocytes in cases of febrile transfusion reaction. Serum bilirubin total and indirect are raised in case of haemolysis.

The sulfosalicylic acid test helps to differentiate between haemoglobin and non-protein pigment, probably porphyrin in the urine. The ammonium sulphate precipitation test is based on the fact that haemoglobin and myoglobin are precipitated in urine at different degrees of ammonium sulphate saturation.. **Serological tests:**

Perform a direct antiglobulin test (DAT) on post-transfusion EDTA sample before refrigeration immediately on receipt. If test is positive, perform DAT on pre-transfusion sample to verify whether sensitisation is due to transfusion or it pre-existed. Repeat grouping and antibody screening of patient's pre-transfusion sample.

Repeat grouping and antibody screening of patient's post-transfusion sample.

Repeat grouping and antibody screening of donor sample.

Repeat grouping of unit from bag. In case of packed cell unit, do only cell grouping. In case of FFP, do only serum grouping.

Repeat crossmatching of donor with patient's pre and post transfusion samples using saline / enzyme / IAT. Use donor cells from blood bag and not the pilot tube..

Leucocyte Antibody Test:

6.2.1 In case of febrile transfusion reaction and hypotension, look for leukocyte antibodies

Bio-chemical tests:

Note colour of plasma. Plasma is pink, if haemoglobin is present and icteric if bilirubin is present.

Separate the patient's pre and post transfusion serum and send to biochemistry department in a 5 ml screw cap plastic vial bearing the date, patient and test identification for estimation of serum bilirubin total, direct and indirect and estimation of plasma hemoglobin.

Send the biochemistry request form with proper entries along with the sample.

Collect the report from biochemistry lab.

Tests on post-transfusion urine sample:

Red colour indicates haematuria or haemaglobinuria.

Add 3ml of 30g/l solution of sulfosalicylic acid to 1 ml urine. Mix well and filter

No precipitate Filter retains colors Precipitate Formed

Colour Pigment is a protein

Non protein pigment is probably porphyrin

Add 2 8 g NG4 4 (SO)2 to 5 ml urine (=80% saturation)

Filter is clear precipitate is colored

Filter retain color colour Precipitate is coloured Haemoglobin/Myoglobin

Microbiology:

Send the donor unit for smear and culture (at 37ºC, room temperature and 4ºC) to bacteriology department.

Make proper entries in the bacteriology despatch book and bacteriology request form and send along with the unit.

Collect the report from bacteriology lab.

If donor unit reveals bacteremia, then request the attending doctor to get the patient's blood culture done and report the findings to the blood bank officer.

Interpretation:

Any red cell incompatibility found during the investigation explains a haemolytic transfusion reaction.

The DAT will be positive and a mixed field reaction will be seen if in vivo sensitisation of transfused red cell has occurred.

The DAT may be negative even in cases of haemolytic transfusion reaction, if the cell destruction is severe.

If any antibody is detected in patient's serum, the donor cells should be positive for the corresponding antigen.

Detection of leucoagglutination explains a febrile reaction or hypotension.

Serum bilirubin total and indirect are raised in case of haemolysis.

Haemoglobinemic and haemoglobinuric are highly suggestive of red cell destruction, but are not necessarily caused by antigen-antibody reaction, unless confirmed.

Limitations: The non serologic possibilities of haemoglobinemia and haemoglobinuria are:-

Hemolysis of blood before transfusion.

Poor technique of collecting post transfusion sample.

Myoglobinuria following major surgery.

Infusion of distilled water during prostatectomy.

Hemolysis due to artificial valve.

Patient's clinical condition; autoimmune haemolytic anemia or paroxysmal nocturnal hemoglobinuria.

Use of glucose or dextrose through the same line before starting blood.

Addition of certain drugs to blood such as ethacrynic acid, hydrocortisone or diphenyl hydantoin.

DOCUMENTATION:

Enter the transfusion reaction in blood issue register, showing date and time of return of the unit and nature of reaction.

Enter the DAT/IAT results in the Antiglobulin test book in the red cell serology laboratory.
Document the results of the entire investigations in the Transfusion Reaction work up form.
Keep record in the Transfusion Reaction Record Register in advanced red cell serology laboratory.

STANDARD OPERATING PROCEDURE

Issuance of Blood and Blood Products

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OP/29	/03/2020	2	ogesh Kumar	r. Gajender Singh
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ocation	**ubject**
sue Counter and Cross match Laboratory	upply of Safe Blood for transfusion
UNCTION	**ISTRIBUTION**
eissue of Blood &Blood Components	Technologist in charge of Issue Counter Supervisor in charge of storage and distribution Office Documents Master File

PURPOSE:
To Issue of blood and blood components..
SCOPE & APPLICATION:
The technologists have the duty to see that the blood is not wasted and made available to another patient of the same group. This is achieved by first-in-first-out (FIFO) policy..

RESPONSIBILITY:
It is the responsibility of the staff to see that the blood which has returned and not used is once again cross matched and made safe for transfusion to another patient.
REFERENCE:
Technical Manuel of the American Association of Blood Banks 13 Edition, 1999. Pages 186, 491, 10.
MATERIAL REQUIRED:
Issue Register
Inventory Register
PROCEDURE:
When blood is released from the Blood Bank to operation theatre or ward of the hospital or outside for transfusion, sometimes for some reason or the other, it may not be required by the patient and it is returned to the blood bank. If this unit of blood or blood component arrives within half an hour, it could be reused for another patient. Take care to see that this unit of blood is kept erect in the cold room to look out for hemolysis. If there is no hemolysis seen after spinning or standing, issue this unit safely to another patient.
In case of FFP, which comes to the blood bank unused, issue to another patient if there is a demand for that particular group immediately within 6 hours of the first issue. If no call arises, then use it later as FVIII deficient plasma..

DOCUMENTATION:

Make entries of returned units against the issue in the issue register.

Re-enter the unit in the inventory before reissue.

STANDARD OPERATING PROCEDURE

Labelling of Blood and Blood Components

Number	Effective date	Page	Author	Authorised by
SOP/31	01/03/2020	02	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	04	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Storage Area	Labelling of Blood Bags and Blood Components
FUNCTION	**DISTRIBUTION**
Ensure safe Transfusion	- Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

To check the quality of antisera.

SCOPE & APPLICATION:

The blood after collection, it is released for transfusion only after all tests (grouping and for TTI) are completed. Before these blood bags are taken on inventory for use they are labelled depending on their blood groups. The label is required for identification and retrieval of blood units for use, disposal and follow up in case of adverse reactions.

RESPONSIBILITY:

It is the responsibility of the technician from the collection and component section to label the blood and blood components units.

REFERENCE:

Technical manual of the American Association of Blood Banks - 13 edition, 1999 Pgs. 156-158.

MATERIAL REQUIRED:

Pre-printed adhesive labels for all components printed as per regulatory requirement.

The labels are printed and colour coded for all components as per blood groups. Group A have yellow labels, Group B pink labels, Group O blue labels and Group AB have white labels. Negative labels also have the same colour labels except the printing is in red colour.

PROCEDURE:

After collection and processing whole blood and component units remain in quarantine storage areas.

Once all the reports of blood group and TTI testing are ready, place the bags on a table in chronological order.

Segregate those which are found reactive for any TTI or found unsuitable for use and keep them in the area for disposal. Leave those found suitable for use on the bench for labelling.

Write clearly the unit number, date of collection and expiry and the volume on each label as per the grouping register records.

Date of collection and date of expiry is very important. The expiry date depends on the type of bag and component. In case of a triple and quadruple bag with additive solution, the expiry date is 42 days, and for double and single bags, it is 35 days. In case of a triple or quadruple bag if for some reason, the components could not be separated, then label the expiry date as 21 or 35 days depending on the anticoagulant present in the primary bag. The day of blood collection is considered the day zero for calculating the expiry dates.

After the bags are labelled ask a second technician to double check the number and group on the bags tallying them with the records.

Enter all labelled bags group wise in the stock book which is also maintained group wise. In the stock book keep a footnote for any autologous blood that is reserved for the patient's own use.

Lable FFP and Cryo deficient plasma, and platelet concentrates in the same manner. Cryoprecipitate labels do not indicate blood groups.

All plasma components have an expiry date of one year. The expiry date of platelet concentrate is 3 days with PVC bags and 5 days if special bags are in use.

DOCUMENTATION:

Enter all labelled bag numbers in the inventory of units for use.

STANDARD OPERATING PROCEDURE

Preservation of Blood and Blood Components

Number	Effective date	Page	Author	Authorised by
SOP/32	01/03/2020	03	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	03	Dr. Dimple Mehrotra	24-02-2020

Location	Subject
Storage Area	Preservation of Blood and Blood Components
FUNCTION	**DISTRIBUTION**
Optimum Storage of Blood and Blood Components	- Supervisor in charge of storage and distribution - Office Documents - Master File

PURPOSE:

To Preservation of Blood and Blood Components.

SCOPE & APPLICATION:

Blood components prepared are stored in conditions designed to preserve optimal viability and function during the storage period.

RESPONSIBILITY:

It is the responsibility of the technical staff from the component laboratory to keep the units in the quarantine storage. The technologist who labels the units after the testing is responsible to transfer the labelled units in their respective storage areas.

REFERENCE:

Technical Manual of American Association of Blood Banks 13 Edition, 1999. Pages 166-167, 182-183, 84, 86.
Introduction to Transfusion Medicine, Zarin Bharucha & D.M. Chauhan, 1 Edition, 1990, Pages 111-112..

MATERIAL REQUIRED:

Storage Equipment

Blood bank Refrigerator

Deep Freezer

Platelet incubator
Platelet agitator.

PROCEDURE:

All untested units should be kept in the quarantine area.
After testing is over, release the fully tested. Transfer those deemed suitable for clinical use from quarantine area to the stock area after labelling.
Label those found unsuitable for use with a biohazard label and keep for disposal.
Store whole blood and Red Cell concentrates on metal rack stand in the Cold Room (4-6º C). These stands have shelves. Each shelf is reserved for a particular group having its label stuck on the outer side. Arrange the blood bags in chronological order, group wise and according to the expiry dates in trays and then stack the trays on the shelves. This makes it very easy for the technologists on duty to remove the bags for issuing, whenever required.
Store blood collected in CPD-A1 and the red cells separated in a closed system up to 35 days. Store the red cells suspended in additive solutions up to 42 days. Use red cells prepared in open system within 24 hours of preparation.
Keep Fresh Frozen Plasma, cryoprecipitate and FVIII deficient plasma bags in over wrap bags and then arrange in plastic trays in the Deep Freezer (-40ºC) immediately after separation. The shelf life of all these plasma components is 1 year. FFP once thawed and then refrozen is used only as FVIII deficient plasma.
Place Random donor platelets (RDP), Single Donor Platelets (SDP) in a platelet incubator at 20-22ºC on a agitator which has shelves to store them. Store the concentrates prepared in PVC bags up to 3 days and those prepared in special platelet bags up to 5 days.
Take due care to maintain sterility of all components by keeping all storage areas clean.
Monitor to ensure the storage conditions to be appropriate and correct for each product. Monitor the temperature of all storage areas with continuous graphic recorder. Change the charts every week, and achieve them. Check the alarm system every month.
Similarly, after labelling the plasma bags, enter the unit numbers group wise in the stock register. Make FFP entries on the right hand page of the stock register, whereas Factor VIII-D plasma & Cryo units on the left hand page. Carry out physical stock taking every night and rewrite the inventory.

Products	PCV/WB	FFP	Cryo	PRP/RDP/SDP
Temp	2-6ºC	30ºC to -80º C	-30ºC	22ºC with gentle agitation
Shelf Life	35 days (42 days SAGM)	One year	One year	Days

DOCUMENTATION:

Record all blood/components released for use as well as the unsuitable units to be discarded in the disposal register.

STANDARD OPERATING PROCEDURE

Autoclaving

Number	**Effective date**	**Page**	**Author**	**Authorised by**
SOP/35	01.03.2020	04	Yogesh Kumar	Dr. Gajender Singh
Version	**Review Period**	**No. of Copies**	**Approved by**	**Date**
01	Two Year	02	Dr. Dimple Mehrotra	24.02.2020

Location	Subject
Sterilization cum washing room	Autoclaving
FUNCTION	**DISTRIBUTION**
Autoclaving of Blood units	- Sterilization cum washing room - Master File

PURPOSE:

This procedure covers the correct handling, treatment by autoclaving, and disposal of filled blood bags that have been discarded as waste.

SCOPE & APPLICATION:

Blood bags are used for collecting blood donated for transfusing patients. Once rejected for use (contaminated, incorrect typing, TTI rective or positive or expired), the bags blood will need to be treated prior to disposal to reduce any potential for infection. The discarded filled blood bags will need to be disinfected prior to disposal, to prevent the spread of disease. If blood is known to be contaminated, it will require disinfection prior to disposal and autoclaving is the recommended treatment method. Because blood bags are usually made from the chlorinated plastic PVC (polyvinyl chloride), they should not be incinerated, due to the generation of dioxins and furans during the burning process. These toxic compounds cause cancers even in low concentrations. In addition, where the incineration devices are basic, the burning bags may leak, which will create a hazard in the vicinity of the incinerator. Autoclaving is the preferred option for treatment of blood bags.

Responsibility:

This is the responsibility of all personnel who are trained and authorized to handle discarded blood bags.

All training must be documented, updated regularly and filed by the responsible person.

The department manager is responsible for: Ensuring that waste blood bags are responsibly handled and treated, prior to disposal and that action is taken to solve any reported problems.

REFERENCE:

Chitnis V, Chitnis S, Patil S, Chitnis D. Treatment of discarded blood units: Disinfection with hypochlorite/formalin versus steam sterilization. Indian Journal of Medical Microbiology, 2003;21(4):265.

United Nations Development Programme–Global Environment Facility (UNDP–GEF), Global Healthcare Waste Project. Guidance on the microbiological challenge testing of healthcare waste treatment autoclaves. New York (NY): UNDP–GEF; 2010. 9 p.

http://gefmedwaste.org/downloads/Guidance%20on%20Microbiological%20Challenge%20
Testing%20for%20Medical%20Waste%20Autoclaves-%20November%202010.pdf

Perkins JJ. Principles and methods of sterilization in health sciences. 2nd ed. Charles C Thomas Pub Ltd; 2008. P. 477-478.

Material for Autoclaving:

Autoclave – for disinfecting waste blood in bags.

Access to the drain for disposal of any residual or expired, clean blood.

Labeled containers for storing waste blood bags at the place where they are used.

Reusable autoclave containers in which to place blood bags or packs, to contain and liquid that may leak from ruptured bags.

Clotted and anticoagulated blood samples of donors and patients

Hazards and Safety Concerns:

Always wear appropriate PPE

PROCEDURE:

Preparing for treatment:

For blood bags with contaminated contents or those considered potentially infectious, ensure all the liquid and the containers are sent for autoclaving to disinfect them prior to disposal.

For blood bags with an attached needle, once the blood bag is ready to be discarded.

Tie a knot in the tubing above the needle.

Drain the blood in the tube back into the bag, using a pen or other suitable device, rolling it along the tube to move the blood.

Cut the needle off the pack and dispose of it in the waste sharps container.

Loading the blood bags in the autoclave.

Observe display to ensure it reads “0 temperature and 0 in press.

Check and fill the reservoir with deionized water to the fill line (see manufacturer's instructions).

Load items into the autoclave chamber per manufacturer’s specifications.

Items to be sterilized are loaded into the autoclave in a manner so that nothing touches the inside of the chamber. Items should be placed into an autoclavable tray on a shelf or rack and never placed directly on the autoclave chamber bottom or floor.

DO NOT OVERLOAD. Leave sufficient room for steam circulation.

Items to be sterilized should be placed into the autoclave so that steam can uniformly flow between items and so that no air pockets are formed between or around them.

Check the drain screen to make sure that it is not plugged or obstructed.

Close door and turn wheel clockwise until display changes from “Door Unlocked” to “Time:” then tighten down wheel a minimum of two additional turns.

Set the appropriate program for time, temperature and pressure. Temperature of the materials reaches 121°C and 15 pounds per square inch (PSI). It can be variable with minimum of 15 minutes.

Check the desired parameters and then press cycle “ON”.

Unloading:

Do not attempt to open the door while the autoclave is operating. Observe display to ensure the pressure reads “Complete V=0 in Hg.”

Turn door wheel counterclockwise until display reads “Door Unlocked.” Slowly open the door and only slightly for about 10 minutes to allow steam to escape.

Keep your head, face and hands away from the opening.

After 10 minutes, open the door completely and allow the materials inside the autoclave to cool for at least 10 minutes before unloading the autoclave.

Discarding autoclaved blood:

Autoclaved blood can either be: Discarded with other solid waste or directly into a placenta pit, septic tank or bio-digester (not if accessed via drains or pipes) or macerated and discharged to a closed drain connected to a treatment system.

Results:

The number or mass of blood bags autoclaved should be included in the autoclave operation log.

Any incidents, including needles remaining on waste blood bags must be reported to the department manager for action.

Report any incidents or accidents, such as spills and needle stick injuries, according to standard institutional procedures. Where prescribed by local legal requirements, the relevant authorities must be notified of any incidents, such as needle stick injuries.

Documentation:

9.1 Incident Log book
9.2 Autoclave Operation Log
9.3 On-site Treatment and Disposal Of Blood Transfusion Products Guidance
9.4 Autoclave Operation — SOP

9

DEPARTMENT OF BURN & PLASTIC SURGERY

Department of Burns and Plastic Surgery in PGIMS, Rohtak is the only Burn centre in the state and it was established in 1978 in this institute under guidance of Dr RK Keswani (Prof.), who also was heading Gen. Surgery department. Later Dr Karoon Aggarwal, joined with Dr Keswani as a consultant and contributed further for the department. After Dr Keswani, Deptt. was headed by Dr G.S. Kalra, who had keen interest in craniofacial anomalies and reconstruction. Later deptt. was headed by Dr Ravi Mahajan, who contributed much to the department in micro vascular surgery. Dr A.S. Rathee was the head after Dr Ravi Mahajan and developed the department further. Dr R.B. Singh took over as head in 2004 and developed genitourinary Surgery part. Dr R.B. Singh was retired in 2017. Currently the department is being headed by Sr. Professor & Head Dr Kuldeep Singh.

Organization of Department:-

The department is working as a single unit entity with a total of four faculties under the guidance of Head of Department Dr. Kuldeep Singh.

Faculty in Department:-

Name	Qualification	Designation
Dr. Kuldeep Singh	MS, M.Ch	Sr. Professor & Head
Dr. Bhupender Singh	MS, M.Ch	Assoc. Professor
Dr. Akhil Garg	MS,M.Ch	Asstt. Professor
Dr. Krittika Aggarwal	MS, M.Ch	Asstt. Professor

Details of the Department:-

The department is located in B block of Lala Sham Lal building of the hospital in ward 19. Total numbers of beds are 44, out of which 24 beds are exclusively for burns patients.

Out Patient department (OPD) Services:-

Days: Tuesday, Thursday & Saturday.

On 2nd Floor of Ch. Ranbir Singh OPD Block (Room No. 207-211)

Elective OT Services:-

Days: Monday, Thursday & Friday

In main Surgery Operation Theatre Complex

Minor OT Services:-

Minor procedures are done almost every day in OPD, in ward after working hours and on holidays.

Emergency OT Services:-

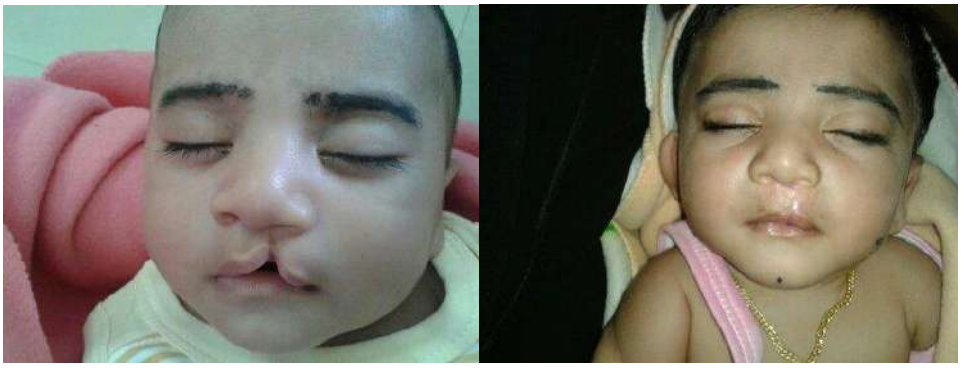
Emergency procedures are done routinely in Trauma OT Complex.

Departmental Services :-

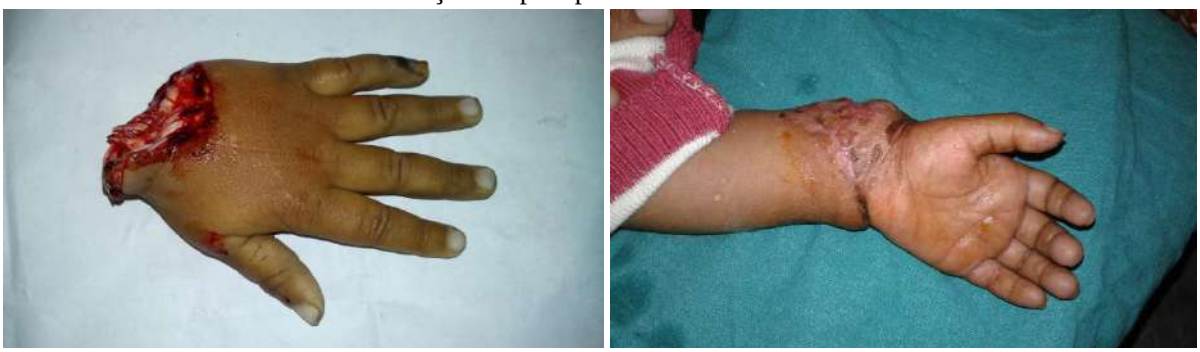
All procedures related to plastic surgery are done in our department, but to name a few of them with pictures are:

- Management of acute & chronic burn patients.
- Post traumatic reconstructions (emergency & elective)
- Management of Cleft & craniofacial anomalies
- Post oncosurgical resection reconstructions.
- Microsurgical procedures including replantation, free tissue transfer& AV Fistula for dialysis.

- Hand surgeries including trauma & congenital anomalies
- Cosmetic procedures-Rhinoplasty/Gynaecomastia correction/Scar Management etc.
- Management of Maxillo Facial Trauma & Facial Fractures.
- Pressure sore surgeries.
- Brachial plexus surgeries.



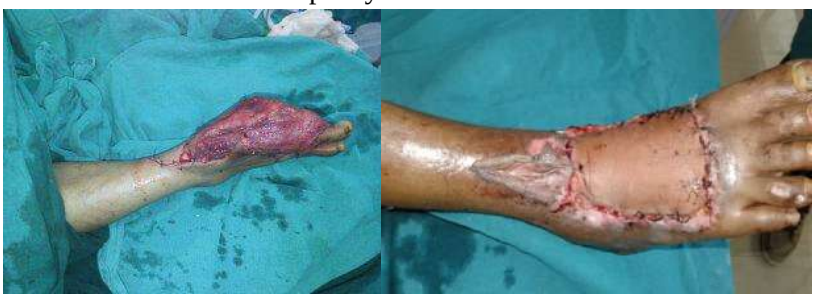
Çleft Lip Repair



Hand Re-plantation

Scalp Re-plantation

Rhinoplasty



Free Flaps

OPD Consultation Procedure:-

The patients presenting to the departmental OPD on the designated days are provided consultations after hospital registration. Relevant investigations, treatment & drugs are advised. Provisional booking for elective surgeries is done after anaesthesia clearance. Admission of previously dated patients and other patients requiring urgent intervention immediate admission is done from OPD. Follow up of operated & discharged patients including dressings is also done in OPD.

Consultant Duties:-

Consultants in the department are actively involved in following:

- Management of patients are admitted in the ward including ward rounds, wound assessment & pre operative & post operative management.
- OPD consultants & patient follow up.
- Surgical treatment of emergency and elective patients in emergency routine and minor OT.
- Various Academic and teaching activities of the College and Department.

At present, there are no Senior Residents posted in the Department and four Junior Residents are posted with the Department. The Junior Residents are involved in assisting the consultants in patient management.

Emergency and Elective Patient Care:-

The patients presenting to Emergency and Trauma Centre who requires plastic surgery intervention are provided consultation by the consultants as per departmental duty roaster. The patients requiring surgery in Trauma Centre are operated by the Department Consultants.

The patients who present for Elective Surgeries are seen by consultants, investigated and given a provisional date for surgery after Anaesthesia clearance. Elective surgeries are performed after admission on the provisional date by the department consultant.

Teaching Programme:-

The department had been running M.Ch course since 2009. Five candidates have completed their M.Ch. successfully from the department and have been serving in different part of the country. The course was temporarily suspended in 2017 and is expected to start from the next Academic Session. The department

is also involved in teaching of Post Graduate students from the department of General Surgery and Orthopaedics as well as training of F.N.B. Trauma Surgery students.

Future plans of the department:

- Establishment of State of the art burn center with aim to reduce morbidity and mortality.
- Establishment of microsurgery unit.
- To improve hand surgeries with respect to functional aspect.
- To establish cosmetic surgery center.

Our strengths:

- Catering services to burn patients
- Treatment of injured and amputated limb with aim of return of patient to his/her daily routine as early as possible.
- Treatment of patients of hypospadias with aim to counter their psychological, functional and sexual problems.
- Services to pressure sore patients to reduce their morbidity.
- Services to cleft lip/palate patients.
- Aesthetic surgeries with aim to gain self esteem of the patients

10

DEPARTMENT OF CARDIAC SURGERY

1. **Distribution of department into Units**- Single Unit only.
2. **Detail of faculty**-
   Dr. S.S. Lohchab (Senior Professor & Head), Dr. Sandeep Singh (Assistant Professor).
3. **Details of OPD/OT/Ward days**:-
   OPD- Tuesday, Thursday, Saturday.
   OT- Monday, Wednesday, Friday.
4. Services provided by the department including special clinics and SOPs followed in OPD consultation, admission, treatment and discharge of patients run by the department with days:-

DEPARTMENT OF CARDIAC SURGERY

Facilities Available /Services Provided

OPD Room No 228

Tuesday Thursday Saturday

Patients suffering from the following diseases requiring mainly surgical management are catered

1. All types of heart ailments which primarily are Coronary artery disease, Valvular heart diseases, congenital heart defects, Atrial fibrillation, Ascending aortic and aortic arch aneurysm and dissection, Tumors of heart, Diseases of Pericardium and Endocarditis.
2. All types lung diseases which include Lung infections, carcinoma , emphysema, congenital defects, pulmonary thromboembolism and trauma.
3. Diseases of Trachea, Pleura , Mediastinum, Chest wall and Diaphragm.
4. Vascular diseases which include Abdominal Aortic Aneurysm, Peripheral Arterial Disease, Thoracic outlet syndrome and Deep vein thrombosis.

Investigations and Tests

1. PT and INR
2. SPO_2 , Electronic BP
3. Voice Doppler
4. 12 leads ECG

Clinics: Valve Clinic –Thursday
Vascular Clinic – Saturday

Indoor ward First Floor LSL Super specialty Centre

16 indoor beds Central O_2 supply and Suction, Basic bedside monitors and 12 leads ECG machine.

CICU First Floor LSL Super specialty Centre

Centrally air conditioned 8 ICU beds Having latest state of art facilities: High end ICU beds, advanced multi parameter monitors, ventilators, cardiac output monitors, IABP, ABG analyser, Defibrillators, Syringe and infusion pumps, High vacuum suction machines, Lung vibrator, ACTanalyser, PT analyser, portable X-ray machine, 12 leads ECG machine, echocardiography including TEE and emergency exploratory instruments.

Services : 1. Postoperative care of cardiac surgical patients which includes
Mechanical Ventilation
Advanced Hemodynamic Monitoring
Infusion of lifesaving cardiac drugs

ABG
12 lead EC
Emergency exploration for bleeding
Cardiac Assist IABP
Cardiac output monitoring
Echocardiography including TEE
Percutaneous Tracheotomy
CRRT

Department provides 24 hr emergency care of Postoperative cardiac surgical patients who land up with complications & telephonic advice for patients in remote areas.

Cardiac Surgery Operation Theatre : First Floor LSL Superspeciality Centre

Centrally air conditioned State of the art Cardiac surgery operation theatre having two heart lung machines with facility of advanced hemodynamic monitoring including cardiac output monitoring. Facilities for both adult and paediaric open heart surgery.. Unique only in India Cardioablator for cryomaze procedure. 4D TEE including pediatric probe. One OT is for thoracic and vascular surgery.

Operations(Surgical Operations) Performed

1. CABG both on pump and off pump
2. Post MI VSD Closure
3. Ischemic MR Repair
4. Leading centre in India performing Mitral valve repair in RHD
5. MVR
6. AVR
7. DVR
8. Tricuspid Valve Repair including Innovative technique of PGIMS Rohtak
9. Cryomaze procedure for Atrial Fibrillation(only centre in India)
10. Aortic aneurysm and Dissection surgery Bental procedure and David Procedures
11. ASD Closure
12. VSD closure
13. Total Correction for TOF
14. Intracardiac repair of AV Canal defects
15. Intracardiac Repair TAPVC and PAPVC
16. DORV correction
17. RSOV repair
18. B T shunt
19. PDA Closure
20. Pericardiectomy
21. Excision of Cardiac Tumors
22. Abdominal aortic aneu
23. Aortobifemoral bypass Grafting
24. Peripheral artery aneurysm repair
25. Thoracofemoral bypass grafting
26. Cross over femorofemoralbypss grafting
27. Femoropopliteal bypass grafting
28. Carotid endarterectomy
29. IVC Tumor removal
30. Pericardial window
31. Pectus Excavatum correction

32. Thoracic Outlet Decompression
33. Redo cardiac Surgery
34. Thymectomy
35. Mediastinal tumors Excision
36. Pneumonectomy
37. Minimally invasive Cardiac Surgery- ASD closure, VSD Closure, CABG, AVR, MVR.
38. Clipless harvesting of internal memory artery.
37. Lobectomy Lung
38. Bullectomy
39. Decortication
40. Tracheal Repair
41. Bronchus Repair
42. Tracheostomy

Financial assistance to poor patients for open heart surgery under various Govt. schemes

1. National Health Mission –Rashtriya Bal Swasthya Karyakarm –Free of Cost congenital heart surgery. The funds are provided to the hospital under this scheme.
2. AryogyaKosh
3. Prime Minister Relief Fund
4. Chief Minister Relief Fund
5. PMJAY- Ayushman Bharat Scheme

DUTIES OF CONSULTANTS, SENIOR RESIDENTS & JUNIOR RESIDENTS

DUTY ROSTER OF CONSULTANT

O.T.	**CONSULTANTS**
Monday	Dr. S.S. Lohchab, Dr. Sandeep Singh
Tuesday	Dr. SS Lohchab/Dr. Sandeep Singh
Wednesday	Dr. S.S. Lohchab, Dr. Sandeep Singh
Thursday	Dr. SS Lohchab/Dr. Sandeep Singh
Friday	Dr. S.S. Lohchab, Dr. Sandeep Singh
Saturday	Dr. SS Lohchab/Dr. Sandeep Singh
OPD	
Tuesday	Dr. Sandeep Singh/ Dr. SS Lohchab
Thursday	Dr. Sandeep Singh/ Dr. SS Lohchab
Saturday	Dr. Sandeep Singh/ Dr. SS Lohchab
CICU	
Monday	Dr. SS Lohchab
Tuesday	Dr. Sandeep Singh
Wednesday	Dr. SS Lohchab
Thursday	Dr. Sandeep Singh
Friday	Dr. SS Lohchab
Saturday	Dr. Sandeep Singh

Sunday	Dr. SS Lohchab
Ward	
Monday	Dr. Sandeep Singh
Tuesday	Dr. SS Lohchab
Wednesday	Dr. Sandeep Singh
Thursday	Dr. SS Lohchab
Friday	Dr. Sandeep Singh
Saturday	Dr. SS Lohchab
Sunday	Dr. Sandeep Singh
Emergency Duty	
Monday	Dr. SS Lohchab
Tuesday	Dr. Sandeep Singh
Wednesday	Dr. SS Lohchab
Thursday	Dr. Sandeep Singh
Friday	Dr. SS Lohchab
Saturday	Dr. Sandeep Singh
Sunday	Dr. SS Lohchab

5. **Responsibility of emergency care and elective care including emergency operations and elective surgeries**.
   All Staff including Faculty, Senior Residents & Junior Residents.
6. **Detail of UG and PG teaching programme**:-
   I. Teaching roster of UG students is as under:-

TEACHING ROSTER OF B.Sc. PERFUSION TECHNOLOGY 3RD YEAR STUDENTS Year.

Theory- Daily 3.00p.m. to 4.00p.m.

Practical- Daily 9AM to 3PM.

Teaching Faculty:-

1. Dr. S.S. Lohchab, Senior Professor & Head, Department of Cardiac Surgery.
2. Dr. Sandeep Singh, Assistant Professor, Department of Cardiac Surgery.
3. Dr. Ashish M Aggrawal, Post DNB, Senior Resident, Department of Cardiac Surgery.

TEACHING ROSTER OF B.Sc. PERFUSION TECHNOLOGY 2nd YEAR STUDENTS.

Theory- Daily 3.00PM. to 4.00PM.

Practical- Daily 9 AM to 3 PM

Sub: Applied Technology Part-I, Applied Anatomy, Applied Physiology

Teaching Faculty:-

1. Dr. S.S. Lohchab, Senior Professor & Head, Deptt. of Cardiac Surgery.
2. Dr. Sandeep Singh, Assistant Professor, Deptt. of Cardiac Surgery.
3. Dr. Ashish M Aggrawal, Post DNB, Senior Resident, Deptt. of Cardiac Surgery.

II. Teaching roster of PG students is as under:-

TEACHING PROGRAMME M.Ch. CARDIO THORACIC SURGERY

Days	Subject
Monday	Curriculum topics
Tuesday	Curriculum topics
Wednesday	Journal Club JTCS
Thursday	Grand Round

Friday	Seminar
Saturday	Case Presentation (internal departmental meeting last Saturday)
Sunday	New talk of the week- internet presentation

Teaching faculty:-

1. Dr. S.S. Lohchab, Senior Professor & Head, Deptt. of Cardiac Surgery.
2. Dr. Sandeep Singh, Assistant Professor, Deptt. of Cardiac Surgery.

Detail of Hospital round by the faculty:- Daily.

Morning- CICU, Evening- CICU & Ward

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11

DEPARTMENT OF CARDIOLOGY

Cardiology deptt. was sanctioned by Govt. of Haryana in 1988 & became functional in 1999. State of art modern Invasive Cardiology services were made available in the deptt. in 2003 with establishment of Cardiac Cath Lab.

Cardiology deptt. has following faculties:-

1. Dr. Kuldip Singh Laller, Sr. Prof. & Head
2. Dr. Ashwani Kumar, Asstt. Professor.
3. Dr. Rajesh, Asstt. Professor.

Following cardiology facilities are being provided by the deptt. for heart patients :-

1. **OPD Services :-**

   OPD room No. 127 & 128in Ch. Ranbir Singh OPD complex.

   OPD days - Monday, Wednesday, Friday

   Deptt. has heavy OPD workload of 350-400 patients per OPD.

   Patients suffering from all kind of heart diseases are treated in OPD e.g

   Ischemic Heart Disease, Rheumatic Heart Disease, Valvular Heart Disease, Congenital Heart Disease – Acynotic & cyanotic CHD, Arrhythmias, Cardiomyopathies – DCM/HCM/RCM, Hypertension, Peripheral vascular disease, Pericardial disease – Pericardial effusion & CCP, Post PCI, Post Pacemaker Implantation, Post CABG, Post Valve replacement (MVR/AVR/DVR) etc.

2. **Emergency Cardiology Services :-**

   Cardiology emergency services are provided in A&E deptt. on Wednesday & Friday. Patients with life threatening cardiac emergency are admitted to ICCU for Indoor treatment e.g. Acute Myocardial Infarction & other Acute Coronary Syndrome patients, Cardiac Arrhythmias, Heart failure, Valvular Heart Disease unstable patients, Hypertension emergencies, cardiac tamponade etc.

3. **ICCU Services :-**

   Cardiology deptt. is providing Eight bedded air conditioned ICCU services having bedside & central monitoring facilities for the critically sick heart patients. ICCU is equipped with syringe infusion pumps, 12 leads ECG machine services, Defibrillators, IABP etc. Approx. 1700 patients are benefited annually by ICCU services. Acutely sick cardiac emergency patients with life threatening illness e.g. Acute Myocardial Infarction & other Acute Coronary Syndrome patients, Cardiac arrhythmias, Heart Failure, Valvular Heart disease patients, Hypertension emergencies, Cardiac tamponade, Post cardiac catheterization heart patients after the Invasive procedure e.g. Coronary Angiography, Percutaneous

Transluminal Coronary Angioplasty, Pacemaker Implantations(TPI/PPI), Congenital Heart Disease Catheterization, BMV, Renal Angiography, Peripheral Angiography, Post Pericardiocentesis.

4. Indoor Services :-

Approximately 2000 heart patients are annually admitted as indoor patients in the deptt. for treatment of heart diseases & also various cardiac invasive procedures. 20 beds are available for the Indoor heart patients.

5. Investigations/Tests facilities for heart patients :-

i) ECG.

ii) Echocardiography.

iii) Tread Mill Test (TMT).

iv) Angiography (Coronary, Aortography, Renal, Peripheral, Carotid).

v) Cardiac Catheterization for Congenital Heart disease.

6. Invasive Cardiology Services :-

Cardiac Catheterization Laboratory invasive procedures for heart patients :-

Approx. 9000 heart patients have benefited by various invasive cardiology procedures done for the heart patients e.g.

1. Coronary Angiography (CAG).
2. Percutaneous Transluminal Coronary Angioplasty (PTCA)
3. Primary Coronary Angioplasty for Acute Myocardial Infraction (AMI),
4. A life saving procedure in AMI.
5. Permanent Pace Maker Implantation (PPI).
6. Temporary Pace Maker Implantation (TPI)
7. Congenital Heart Disease Cardiac Catheterization.
8. Renal Angiography.
9. Peripheral Angiography.
10. Aortography.
11. Carotid arterial angiography.
12. Renal arterial embolization
13. Pericardiocentesis

Large number of patients who have undergone Cardiac Catheterization in Cardiac Cath Lab have been benefited by undergoing Open Heart Surgery in Cardiac Surgery department and thus PGIMS, Rohtak is providing complete Cardiac Care to the heart patients.

7. **Echocardiography Services** :-

State of art Echocardiography facilities are available for heart patient & over 81612 patients have benefited by this facility.

8. **TMT facility :-**

Approx. 4302 TMT procedures have been done.

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DEPARTMENT OF COMMUNITY MEDICINE

A) Distribution of department into units: The department of Community Medicine has **two units**.

B) Details of faculty unit wise:

Unit-I	**Unit-II**
1)Dr R.B. Jain Sr. Professor (fl) & Head of the Department	1)Dr B.M. Vashisht Professor &Unit Head
2) Dr Neelam Kumar Professor	2)Dr Meena Professor
3)Dr Meenakshi Kalhan Professor	3)Dr Ramesh Verma Professor
4)Dr Varun Arora Assoc. Professor	4)Dr Vinod Chayal Assoc. Professor
5)Dr Raj Kumar Asstt Professor	

C) Detail of OPD/ OT/ Ward days unit wise- **Not Applicable**

D) Services provided by the department including Special Clinics and SOPs followed in OPD consultation, admission, treatment and discharge of patients run by the department with days-

-This department is running an **Immunization Clinic** which is housed on the second floor of the new OPD complex of the institute (Room No 206). The immunization services are being provided in accordance with prevalent national guidelines. This clinic also provides Montoux test facility and management of animal bite cases. The services are made available to the public on all working days.

E) Duties of Consultant, Senior Residents and Junior Residents- Two faculty members Dr Neelam Kumar (Prof) and Dr Ramesh Verma (Prof)are the incharge of the Immunization clinic and 2 junior residents are posted in the clinic daily on rotation basis.

F) Responsibility of emergency care and elective care including emergency operations and elective surgeries- Not Applicable

G) Detail of UG and PG teaching programme- UG teachingas per the teaching roster of the department in accordance with the time table provided by the Dean PGIMS, Rohtak.

PG teaching as per the teaching roster given below:

Monday- PG class(3-4 pm in winter, 1-2pm in summer)
Tuesday- Seminar(3-4 pm in winter, 1-2pm in summer)
Thursday- Journal Club meeting (3-4 pm in winter, 1-2pm in summer)
Saturday- Seminar(3-4 pm in winter, 1-2pm in summer)

Three PG students are posted (one each) at the Interns training at rural Health Training Centres (RHTC) at CHC Dighal, GH Beri, and CHC Chiri. Faculty members and Senior Residents regularly visit the health centres for supervising Interns' and PG training.

H) Detail of hospital rounds by the faculty- Regular round of Immunization clinic by the faculty incharge for supervision.

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DEPARTMENT OF CHEST & RESPIRATORY MEDICINE

DETAILS OF FACILITIES AVAILABLE / SERVICES PROVIDED

1. OPD – Daily as per roster
2. IPD – 40 teaching beds and 12 MDR Pulmonary Tuberculosis bed.
3. RNTCP (Revised National tuberculosis Control Programme)
   a.) Directly Observe Treatment short course (DOTS) Centre for Registration, Treatment provision and referral of patients, suffering from pulmonary tuberculosis and extra Pulmonary tuberculosis attending this institute to their respective DOT Centre.
   b.) DMC (Designated Microscopy Centre) for sputum smear LED microscopy
   c.) Facility for treatment of MDR/XDR Pulmonary Tuberculosis patients at DOT Plus Site
   d.) Gene Xpert facility existing at Deptt. of Microbiology for diagnosis of MDR Tuberculosis.
4. Minor OT procedure like Pleural aspiration, Pleural Biopsy, Intercostal drainage, FNAC lung etc.
5. Fiberoptic Bronchoscopy.
6. Pulmonary Function test having detailed Spirometry.
7. Facility for nebulisation, Pulse Oximeter, Bed side Multi Para Meter Patient Monitors
8. Centralized, Oxygen supply and suction facility.

SOP Department of Respiratory Medicine.

1. **Location:-** Department is located in New OPD building third floor, K Block (for OPD & Office) and chest ward in hospital building ward no. 17 (indoor facilities)
2. **Faculty:-**

SR. NO.	NAME	DESIGNATION
1.	Dr. K.B.Gupta	Sr. Prof. & Head
2.	Dr. Prem Parkash Gupta	Professor
3.	Dr. Rajesh Gupta	Professor
4.	Dr. Vipul Kumar	Associate Professor

3. **Residents:-** There are fifteen Residents Doctors in the department perusing PG Degree.
4. **Interns** are posting as Elective posting (on the average one –two interns).
5. **Nursing Staff in the Ward -** There are 2 sisters and nine staff Nurse posted in the ward 17 for patient care.
6. **Lab. Technicians:-** Only one Lab. Technician who is posted at designated Microscopy centre in OPD area.
7. **OPD Services:-**Department runs daily OPD for patients suffering from Respiratory diseases including all the referral from this hospital and outside hospital. OPD is conducted Counter Room No. 325 in hospital timing and UHID No. is generated in the computer. Then they are attended by Doctors in the OPD Rooms. Patients requiring investigation as advised by the doctors are given investigations slips, and they are advised for regular follow in the OPD as per days mentioned in the OPD Slips.

Department also runs following four special Clinics under supervision of Consultant during OPD hours.

1. COPD Clinic.
2. Lung Cancer.
3. MDR TB Clinic.
4. Anti-smoking Clinic.

8. Indoor Services:- There are forty teaching beds and twelve MDR TB Beds in ward No. -17 for seriously ill patients and for patients requiring further specialized investigations. Round the clock, patient care is provided by Resident Doctors on duty and Nursing Staff. Residents Doctors by rotation and Staff Nurses are posted in the ward round the clock to look after the patients. Morning and Evening round are also done by consultant on rotation and consultants are also available on call after duty hours to advise Resident Doctors regularly.

9. Accident & Emergency:- One Resident doctor is regularly posted round the clock in A&E Department to provide specialized services to patients coming with Respiratory Emergencies. Any patient having medical problem is first attended by department of Medicine and if needed or having respiratory Emergencies then they are referred to Doctors on duty of Resp. Medicine. Patients are investigated in the emergency Department and if needed they are admitted in Chest ward 17 for further management. Patient having co-morbidities are referred to concerned specialities including department of Medicine. Patients requiring intensive care and assisted ventilation are referred to Medical ICU located in A&E under department of Pulmonary and Critical Care Medicine and Res. Intensive Care Unit in the department of Anaesthesia for further care.

10. Specialized Services available in the Department:-

1. Semi-rigid Thoracoscope
2. Fiber –optic Bronchoscope
3. Computerized PFT equipment.
4. Pulse Oximeters.
5. Non Invasive Ventilators
6. Multi parameter patient monitors.
7. ECH
8. Nebulisers
9. Syringe pump.
10. Defibrillator
11. Pleural Biopsy and aspiration.
12. Fine needle aspiration.
13. Inter costal drainage.
14. Others like lumbar puncture, ascetic tapping.
15. Resuscitation kit.
16. Crash cart
17. MDR treatment facilities.
18. Central Oxygen supply and Suction facilities.
19. All routine instruments pertaining to Respiratory Medicine.

11. **Revised National TB control Programme-** Department is the Nodal Centre for PGIMS Institute for RNTCP activities and Nodal DRTB Centre of Haryana state for PMDT (Programmatic management of drug resistance TB.)

RNTCP Staff:- Contractual Staff

1. Medical Officer Tuberculosis Control (MOTC) to look after patients registered under RNTCP.
2. Lab Technician – in DMC located in OPD.
3. TB Health Visitor- At DOTS Centre located in OPD.

All RNTCP activities in the Institute are Co-ordinated by Medical Officer Tuberculosis Control (MOTC) under supervision of Nodal Officer RNTCP and nodal Officer DOTS PLUS site. There is a core committee of the Institute under Chairmanship of Director, PGIMS, Rohtak having Senior Faculties of all the department as members who meets quarterly to review the RNTCP activities in the Institute.

Patients suspected of having pulmonary TB are assessed by the Doctors and when TB is confirmed then patients is referred to RNTCP where he is registered and referred to nearest DOTS Centre for intiation of anti-TB treatment provided free of cost by the Govt. Similarly,patients of extra pulmonary TB referred from other clinical department are also registered for free treatment and sent to nearest DOTS Centre of his area of residence for initiation of treatment.

Patients suspected of having MDR TB are initially by clinicians investigated for drug resistance by Cartrodge Based Nucleic Acid Amplification Test (CBNAAT) in department of Microbiology PGIMS, Rohtak. Further MDR/XDR TB is evaluated at IRL, Karnal and NRL, NITRD, Mehrauli, Delhi under RNTCP norms. Patients with confirmed MDR TB/XDRTB are admitted for pre-treatment evaluation and starting of treatment regimen as per RNTCP Guidelines. Patients of confirmed MDR TB/XDR TB are referred from other parts of Haryana started on treatment. After treatment initiation, they are referred to the District TB Officer (DTO) of his area of residence for continuation of treatment. All the TB patients including MDR TB /XDRTB patints are also registered under NIKSHAY entry.

12. **UG and PG Teaching:-** The department is actively involved in clinical teaching of MBBS students. The students are posted in the department by rotation for fifteen days of clinical posting. Theory lectures are also held as per schedule.

Post-Graduate in the department are imparted teaching in the form of bed side clinical teaching, regular seminars, case discussions, journal club meetings and Institutional CPC and Research Forum meetings.

14

DEPARTMENT OF CENTRAL STERILE & SUPPLY DEPARTMENT

SOP No.: 1

Title: SOP FOR OPERATION OF AUTOCLAVE

OBJECTIVES:

To lay down a procedure for the operation of Autoclave

SCOPE:

This procedure is applicable to Autoclave used in CSSD.

RESPONSIBILITY:

Sterilization Technician, CSSD Attendants, Bearers.

PROCEDURE:

1. Ensure the instrument is clean and free from dust and placed in a clean area with proper packing and steam indicator.
2. Open the door of sterilizer and load the articles in chamber during this process the steam inlet valve for jacket pressure opened.
3. Close the door after completion of loading of articles.
4. Set all the valves for pre vacuum (remove the air from chamber).
5. Set all the parameters and open the main operating valve for supply of saturated steam from jacket to chamber.
6. When pressure of chamber reached about 15 PSI and temp reached 121^0 C, then start the sterilization cycle for a holding period of 15 to 20 minute
7. After completion of holding period, start the steam exhaust phase from chamber.(Manually)
8. Then start the vacuum and dry phase at least 10 minute (Manually)
9. Allow the pressure to normalize and temperature less than to 70°C.
10. Switch OFF the main valve and open the door of the sterilizer to remove the sterilized stuff.
11. Clean the sterilizer after every cycle.
12. For ensuring the sterilization quality, do the culture test every week.
13. Maintain all record of Autoclave cycles and culture report properly.
14. After completion the sterilization technician should enter the details as per the annexure General Precautions:
    a) It should be operated by a person having proper knowledge about it.
    b) Ensure that all steps of operating procedure are followed.
    c) If desired pressure is not achieved, check for leakage & monitoring devices and inform to maintenance department accordingly to rectify the problem if any.
15. If the instrument does not produce required calibration results, its pressure or temperature response is poor then it should be labelled as FAULTY or UNDER MAINTENANCE and should be repaired or serviced.

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SOP No.: 2

Title: SOP FOR CLEANING OF AUTOCLAVE.

OBJECTIVES:

To lay down a procedure for Cleaning of Autoclave.

SCOPE:

This procedure is applicable for cleaning of Autoclave at CSSD, PGIMS, Rohtak.

RESPONSIBILITY:

Sterilisation Technician, CSSD Attendants, Bearers.

PROCEDURE:

1. Wipe the outer surface of autoclave with a wet sponge, clean cloth and pipe connections with clean dry cloth every day before operating autoclave.
2. Clean the chamber once in a week with detergent solution using brush and wash with tap water to remove detergent. Then wash with demineralised water. Finally wipe the chamber with clean dry cloth.
3. Clean the sterilizer after every cycle of sterilization.
4. Sterilization Technician will ensure the cleaning procedure & completion.

SOP No.: 3

Title: SOP FOR STERILIZATION OF ARTICLES IN ETHYLENE OXIDE STERILIZER

OBJECTIVES:

To lay down a procedure for sterilization of Articles in Ethylene Oxide Sterilizer received from various departments after use.

SCOPE:

This procedure is applicable to ensure proper packing and sterilization of articles.

RESPONSIBILITY:

Assistant Supervisor, Sterilisation Technician, CSSD Attendants, Packers.

PROCEDURE:

1. Used articles (to be sterilize by ETO) received from various departments in receiving section of CSSD.
2. Segregate the articles as per their sizes of packing paper.
3. Packing of all articles in packing papers by sealing machine.
4. Mark the stamp on the packed article and write the deptt. name & date of sterilization.
5. Switch on the AC of ETO room.
6. Put all the packed articles in ETO sterilizer Chamber.
7. Remove the wet air and water from the filters of machine before operation of sterilization.
8. Insert the Ethylene Oxide gas cartridge of 170 gms in port given in ETO sterilizer.
9. Put the packed biological indicator in Chamber with the load.
10. Close the door of sterilizer and turn on the machine. ETO machine works on two temperatures i.e. 37° C & 55° C and in three stages i.e. **Preconditioning, Gas expose and aeration.**

11. On 37° C, preconditioning starts at a pressure of more than 900mbar and relative humidity more than of 40%. Machine runs in **Preconditioning stage** for 1 hour 20 minutes. After this stage **gas expose stage** starts, in this stage gas is exposed in machine from the ethylene gas cartridge at a pressure of 450-600 mbar and penetrates in the packed articles in chamber for three hours. Then machine exhausts

its EO gas from chamber for 45 minutes from drain out pipe situated above roof of building as per norms. This 45 minutes time is called **purge time** and this time is not shown in graph. Mostly all the EO gas exhausts in this purge stage. Left EO gas is exhausted in **aeration stage** of cycle that is of three hours.

OR

On 55° C, preconditioning starts at a pressure of more than 900mbar and relative humidity more than of 40%. Machine runs in **Preconditioning stage** for 1 hour 20 minutes. After this stage **gas expose stage** starts, in this stage gas is exposed in machine from the ethylene gas cartridge at a pressure of 450-600 mbar and penetrates in the packed articles in chamber for one hour. Then machine exhausts its EO gas from chamber for 45 minutes from drain out pipe situated above roof of building. This 45 minutes time is called **purge time** and this time is not shown in graph. Mostly all the EO gas exhausts in this purge stage. Left EO gas is exhausted in **aeration stage** of cycle that is of three hours.

12. After completion of cycle machine is switched off and door is opened after reduce of pressure. The graph of cycle is filed in record and biological indicator is send to microbiology for sterility assurance/validation and record is maintained of the receipt from microbiology department
13. After receipt of test report of biological Indicator from microbiology department, articles are issued to the concern departments if report is found OK and cycle to be run again if report is found negative.
14. Articles sterilized by ETO sterilizer are valid for 6 months from the date of sterilization with the condition that articles should not be unwrapped.

SOP No.: 4

Title: SOP FOR FUMIGATION.

OBJECTIVES:

To lay down a procedure for Fumigation of Sterile store.

SCOPE:

This procedure is applicable for cleaning and Fumigation of Sterile Store at CSSD, PGIMS, Rohtak.

RESPONSIBILITY:

Sterilisation Technician, CSSD Attendants, Bearers.

CHEMICAL COMPOSITION:

1. FORMALDEHYDE (37-41%) = 250 ml
2. POTASSIUM PERMAGNATE = 50 gms or Formaldehyde fumes by fumigator

PROCEDURE:

16. Remove all articles from the site before fumigation.
17. Wipe the whole interior of sterile store with savelon/ sodium hypochlorite solution i.e. walls, racks, slab and floor .
18. Add Potassium Permanganate with Formaldehyde (37-41%) in a trey and put the solution in sterile store after wiping.
19. Close all the doors and windows tightly. Put wet clothes and tapes on the small opening of doors and close so that fumes may not leak out.
20. Fumes will generate from solution to control/kill pests, bacteria etc. from the sterile store.
21. The sterile store is left close for a day.
22. Next day culture tubes are sent to microbiology deptt. after taking the samples from the fumigated store i.e. from walls, racks, slabs and floor and record is maintained for the reports received from microbiology.
23. If the report is found negative then fumigation should be done again otherwise the sterilized articles can be store in the area.

SOP No.: 5

Title: SOP FOR STERILIZATION OF INSTRUMENTS TREYS

OBJECTIVES:

To lay down a procedure for Recycling of Instruments Treys received from various departments after use.

SCOPE:

This procedure is applicable to ensure proper washing, disinfection, drying and sterilization of Instruments.

RESPONSIBILITY:

Assistant Supervisor, Sterilisation Technician, CSSD Attendants.

PROCEDURE:

1. Used instruments treys are received from various departments through receiving window of CSSD.
2. Instruments are washed in flushing of water properly to remove the blood stain or other particles.
3. Disinfection of Instruments is done by 5% Benzalkonium Chloride solution.
4. Dry & clean the disinfected Instruments with clean cloth properly.
5. Arrange the specified instruments in specified treys.
6. Sterilization indicator/tapes are placed on the treys before loading in Sterilizer and then properly arrange the treys into Sterilizers for Sterilization. After that the indicator has been checked as colour of indicator changes from green to black or grey. It shows that sterilization cycle done properly & record of sterilization cycle maintained in log book.
7. These sterilized treys are stored in sterile store at marked area of different departments accordingly and distribution is made to the departments from issuing window against receipt.

SOP No.: 6

Title: SOP FOR RECEIVING AND ISSUING.

OBJECTIVES:

To lay down a procedure for Receiving and Issuing of articles.

SCOPE:

This procedure is applicable for Receiving and Issuing of articles from CSSD, PGIMS, Rohtak.

RESPONSIBILITY:

Assistant Supervisor, CSSD Attendants, Bearers.

PROCEDURE:

1. Instruments & other articles received at the site of receiving window up to 9:00 AM daily in morning shift with proper entry in receiving register.
2. Issue Slip against receipt of trey/article is given to concern deptt. after receiving of treys respectively.
3. Other articles i.e. packets, drums and treys are received on the trolleys at the receiving area of CSSD. Whole received articles are entered in register and then carry these articles to sterilization section in different trolleys for sterilization.
4. For validation of sterilization indicator/tape must be checked before loading in sterilizer.
5. After process of sterilization whole articles are stored in sterile store after checking the indicators to confirm the sterilization cycle.

6. Instrument treys and articles are issued through issuing window to respective departments by taking the issue slip and after taking sign on register.
7. Record of every received and issued article is maintained.SOP No.: 7

Title: SOP FOR STORAGE OF STERILE ARTICLES IN STERILE STORE.

OBJECTIVES:

To lay down a procedure for the storage of sterile articles in sterile store.

SCOPE:

This procedure is applicable to store the articles after sterilization process in sterile store.

RESPONSIBILITY:

Assistant Supervisor, Sterilisation Technician, CSSD Attendants.

PROCEDURE:

1. Check whether the sterilization process is OK or not by checking the labels of articles and also check whether shutter of drum is closed or not.
2. Overshoes, cap, mask and proper dress should be wear before entering in sterile store.
3. Sterilized articles are stored in sterile store at their respective places on slabs & racks.
4. Sterile articles are issued from issuing window attached to sterile store.
5. Fumigation should be done time to time.

SOP No.: 8

Title: SOP FOR PACKING AND STERILIZATION OF DRUMS OF SURGERY WARDS.

OBJECTIVES:

To lay down a procedure for packing and sterilization of surgical drums.

SCOPE:

This procedure is applicable to packing and sterilization of drums for various surgery wards.

RESPONSIBILITY:

Assistant Supervisor, Sterilisation Technician, CSSD Attendants.

PROCEDURE:

1. Received drums from various surgery wards and the record to be maintained in register.
2. Open the drums and fill them with gauze piece and cotton cut by gauze cutting machine as per required size and quantity.
3. Close the lid of drums and slide the shutter to perforated side before sterilization .
4. Put the drums in Sterilizer Chamber for sterilization.
5. After sterilization, perforated site of drums shifts to close shutter site and then drums are stored in sterile store.
6. Issue the drums through issuing window after taking the receipt/signature of respective department.

SOP No.: 9

Title: SOP FOR VALIDATION OF THE AUTOCLAVE STERILIZER

OBJECTIVES:

To lay down a procedure for the validation of the steam sterilizer (Autoclave).

SCOPE:

This procedure is applicable to the validation of steam sterilizer to know the efficiency & working of Autoclave.

RESPONSIBILITY:

Assistant Supervisor, Sterilisation Technician, CSSD Attendants.

DETAILS OF AUTOCLAVE STERILIZERS:

Sr. No.	**Size of Sterilizer**	**Make**	**Nos.**
1.	Sterilizer (2'*2'*4')	ESTEEM	4
2.	Sterilizer (2'*2'*4')	YORCO	1
2.	Sterilizer (2'*2'*4')	NAT Steel	1
4.	Sterilizer (3'*2'*5')	ARKO	1

PROCEDURE:

1. There are seven autoclave in CSSD, so arrange seven culture tubes which contain Bacillus Sterothermophilius from microbiology deptt. of PGIMS Rohtak.
2. Then put one tube in each Autoclave.
3. The steam sterilization process involving heating in an autoclave with saturated steam under pressure should be used .
4. After sterilization the tubes are sent to Microbiology Department for incubations and results.
5. The following combination of temperature and time are normally employed after removing of air or moisture from chamber of sterilizer.

S. No.	**Holding Temperature (°C)**	**Minimum Holding Time (minutes)**
1.	121°C to 124°C	15-20
2.	126°C to 129°C	8-10
3.	134°C to 138°C	3-5

6. Maintenance:

   If the instrument does not produce required calibration results, then its pressure or temperature response is poor then it should be labelled as FAULTY or UNDER MAINTENANCE and should be repaired or serviced with checking & monitoring of temperature & pressure devices.

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DEPARTMENT OF ENDOCRINOLOGY

A. **Name of Department:-** **Endocrinology**

B. Distribution of Department into Units:- None

C. Faculty :- Dr. Rajesh Rajput, Sr. Professor & Head

D. OPD days:- Monday & Friday (also see patients in **Medicine OPD on Wednesday & Saturday).**

E. **IPD (Indoor patient admission):-** Ward No.9

F. Facility in the department:-

- Patients with various Endocrinology disorders are seen in OPD and are admitted to ward 9 as and when needed.
- Continuous glucose monitoring (CGMS).
- Insulin Pump.
- Various Endocrine procedures like insulin induced hypoglycemia and clonidine stimulation test for evaluation of short stature, ACTH stimulation test for adenocortical disease and biopsies of various organs like adrenal glands, kidneys are performed for various Endocrines disease according to needs of the patients.
- Prader's orchiodometer for evaluation of puberty.
- Department of Endocrinology utilizes facility for estimation of various hormonal investigations with department of Biochemistry.
- Department of Endocrinology utilizes facility of DEXA with department of Orthopaedics for diagnosis and management of osteoporosis.
- Patients suffering from various types of diabetes are also given education and practice regarding proper administration of insulin injection and reorganization and treatment of hypoglycemia.
- Department is involved in conducting Phase-III clinical trial and a clinical trial room with facility to conduct clinical trials is established in ward No. 9.

G. Department of Endocrinology is involved in teaching and training in subject of Endocrinology to both UG MBBS and PG students.

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DEPARTMENT OF ENT

1. Distribution of department into units: There is only one Head of our department under whom three functional units have been made.
2. Detail of faculty unit wise:
   - First unit: Dr Aditya Bhargaw, Dr Jagat Singh, Dr Vijay Kalra
   - Second unit: Dr Raman Wadhera, Dr Chandni Sharma
   - Third unit: Dr J.S.Gulia, Dr Nikhil Arora
3. Details of OPD/OT/Ward days unit wise:

Unit	**OPD**	**OT**	**Ward/Emergency on call**
First unit	Tue/Fri	Wed/Sat	Mon/Thurs
Second unit	Mon/Thurs	Tue/Fri	Wed/Sat
Third unit	Wed/Sat	Mon/Thurs	Tue/Fri

4. Services provided by the department:

➢ Patients are examined in OPD rooms (314,315,316,317,305).

➢ Minor Procedures done in operation theatre in OPD (room no 308) :

* Ear Syringing for wax removal.

* Biopsy from oral Cavity and Oropharynx.

* External Auditory canal packing in cases of otitis externa.

* Suture removal and dressings.

* Nasal packing in patients of epistaxis.

* Nasal endoscopy.

* Dix-Hallpike test and Epley's manoeuvre in patients of positional vertigo.

* Septal abscess drainage.

* Peritonsillar abscess drainage.

➢ Hearing tests are performed daily. (Room No 303)

➢ Speech Therapy is given daily. (Room No 303)

❖ Tests performed in audiometry room,:

- Pure Tone Audiometry (PTA).
- Speech Audiometry
- Impedance Audiometry (Currently not working)
- Oto-Acoustic emission (Currently not working)
- BERA (Brainstem Evoked Response Audiometry) (Currently not working)

- ASSR (Auditory Steady State Response Audiometry) (Currently not working)

5. Emergency duties of consultants.

Days	**1st on Call**	**2nd on Call**
Mon/Thurs, 3rd Sunday	Dr Vijay Kalra	Dr Jagat Singh
Tue/Fri, 2nd & 4th Sunday	Dr Nikhil Arora	Dr J.S. Gulia
Wed/sat, 1st & 5th Sunday	Dr Chandni Sharma	Dr Raman Wadhera

- Duties of SRs

Days	**OPD**	**OT**	**WARD**
Mon/Thurs	Dr Swati	Dr Ashiya	Dr Arushi
Tue/Fri	Dr Arushi	Dr Swati	Dr Ashiya
Wed/Sat	Dr Ashiya	Dr Arushi	Dr Swati

- Duties of JRs:

Days	**OPD**	**OT**	**Ward/Emergency on call**
Mon/Thurs	1st yr: Dr Bhavesh 2nd yr: Dr Sachin 3rd yr: Dr Vinny, Dr Himanshu	1st yr: Dr Prateek, Dr Aarushi 2nd yr: Dr Abhiraj 3rd yr: Dr Keshav	1st yr: Dr Rachna, Dr Chintan 2nd yr: Dr anshu, Dr Madhuri 3rd yr: Dr Prikshit
Tue/Fri	1st yr: Dr Rachna, Dr Chintan 2nd yr: Dr anshu, Dr Madhuri 3rd yr: Dr Prikshit	1st yr: Dr Bhavesh 2nd yr: Dr Sachin 3rd yr: Dr Vinny, Dr Himanshu	1st yr: Dr Prateek, Dr Aarushi 2nd yr: Dr Abhiraj 3rd yr: Dr Keshav
Wed/Sat	1st yr: Dr Prateek, Dr Aarushi 2nd yr: Dr Abhiraj 3rd yr: Dr Keshav	1st yr: Dr Rachna, Dr Chintan 2nd yr: Dr anshu, Dr Madhuri 3rd yr: Dr Prikshit	1st yr: Dr Bhavesh 2nd yr: Dr Sachin 3rd yr: Dr Vinny, Dr Himanshu

6. UG Teaching programme:

❖ Final Prof 1st part (MBBS Admission yr 2017)

Theory Classes:

Topic	**Teacher**
Diseases of external ear and middle ear, Facial nerve	Dr. Aditya Bhargawa
Diseases of inner ear and otosclerosis	Dr. Raman wadhera
Diseases of pharynx	Dr. Jagat singh
Diseases of Nose and PNS	Dr. JS Gulia

Bronchoesophageology + Tracheostomy	Dr. Vijay Kalra
Diseses of Larynx + Audiology	Dr Chandni Sharma
Recent Advances in ENT + Misc. Topics	Dr Nikhil Arora

Practical Classes:

Days	**Teacher**
Monday	Dr Raman Wadhera
Tuesday	Dr Aditya Bhargawa/ Dr Vijay Kalra
Wednesday	Dr JS Gulia
Thursday	Dr Chandni Sharma
Friday	Dr Jagat Singh
Saturday	Dr Nikhil Arora

❖ Second prof MBBS (admission year 2018)

Theory Classes:

Topics	**Teacher**
Anatomy and physiology of ear	Dr Chandni Sharma
Anatomy and physiology of nose and PNS	Dr Nikhil Arora
Anatomy and Physiology of Larynx and Pharynx	Dr Vijay Kalra

Practical Classes:

Days	**teacher**
Mon/Thurs	Dr Arushi
Tue/Fri	Dr Ashiya
Wed/Sat	Dr Swati

7. Ward 8/ENT rounds by faculty:

Days	**Faculty**
Mon/Thurs, 3rd Sunday	Dr Aditya Bhargawa, Dr Jagat Singh ,Dr Vijay Kalra
Tue/Fri, 2nd & 4th Sunday	Dr J.S. Gulia, Dr Nikhil Arora
Wed/sat, 1st & 5th Sunday	Dr Raman Wadhera, Dr Chandni Sharma

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EMERGENCY OPERATION THEATRE (EMOT)

The Emergency OT provides the 24 hours facility/service of emergency operations of the patients coming to the various departments in PGIMS, Rohtak.

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DEPARTMENT OF FORENSIC MEDICINE

A.	Name of Department:	Forensic Medicine
B.	Distribution of Department into Units	None
C.	Faculty	Dr. S.K Dhattarwal, Sr. Prof & Head Dr. Luv Sharma, Professor, Dr. Jitender Kumar Jakhar, Assoc. Prof. Dr. Pankaj Chhikara, Assoc. Prof Dr . Kuldeep Kumar, Asstt. Prof. Dr. Vinod Kumar, Asstt. Prof.
D.	OPD Days	None
E.	IPD (Indor Patient Admission)	None

FACILITIES IN THE DEPARTMENT:-

1. The Department imparts Undergraduate (MBBS) and Postgraduate (MD Forensic Medicine) teaching in the discipline of Forensic Medicine and Toxicology to the students admitted at our institute and for MSc Forensic Science students of Maharishi Dayanand University, Rohtak (MDU).
2. The Department of Forensic Medicine conducts autopsies on all the deaths of Medico-legal cases occurring at this Institute amounting about 2500 cases per year.
3. The Department also conducts autopsies on the referred postmortem cases from 10 Districts i.e. almost half of State of Haryana amounting to about 700 cases per year.
4. The Department also provides expert services in various districts of Haryana which are referred to this Institute by the Medical Officers/ Investigating agencies/ Hon'ble Courts in the state for expert opinion chiefly in cases of assault, sexual assaults, age estimation, potency/ impotency etc.
5. The Department provides expert tertiary level opinion in various documentary Medico-legal cases referred to our Institute by the Investigating agencies.
6. The Department also provides expert opinion for admitted Medico-legal cases, when sought by various Clinical Departments.
7. Videoconferencing for different Court evidences is conducted in the Department of Forensic Medicine.

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DEPARTMENT OF GASTROENTEROLOGY

Medical Gastroenterology Department provides diagnostic as well as Therapeutic Endoscopy/colonoscopy, Capsule Endoscopy, Fibroscan, Argon Plasma coagulation, Hepatitis C treatment which are available free of cost and without any waiting list. The Hepatitis B free testing and drugs will be made available by Haryana Government/Central Government very shortly.

DETAILS OF FACULTY DEPARTMENT OF GASTROENTEROLOGY

Name of Consultant/Physician	**OPD Day's**
Dr. Parveen Malhotra, Sr. Prof	Monday, Wednesday, Thursday & Friday

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HOSPITAL INFECTION CONTROL COMMITTEE (HICC)

The Hospital infection control committee (HICC) is involved in various activities related to prevention of hospital acquired infections:

1) Strict adherence to standard precautions including hand hygiene and personal protective measures is ensured.
2) Sterilization and disinfection of all patient care equipments and hospital environment is strictly followed and monitored.
3) Environmental sampling is done to monitor effective decontamination and disinfection procedures carried out in the hospital.
4) Autoclaves in the CSSD and other units of the hospital are monitored by biological and chemical indicators to check for effective functioning of the autoclaves.
5) Water surveillance of different areas of health care facility during outbreaks are performed to ensure safe supply of water.
6) Monitoring of antimicrobial resistance is done by keeping a record of the resistance pattern of the bacteria causing infections in our hospital.
7) Various teaching activities and sensitization of health care staff to hospital acquired infection and its prevention are carried out routinely.

LIST OF COMMITTEE MEMBERS

Sr. No.	Name of Committee Officers	Designation
1.	Medical Superintendent	Chairman
2.	Sr. Prof & Head Deptt of Anaesthesia	Member
3.	Sr. Prof. & Head Deptt of Surgery	
4.	Sr. Prof & Head Deptt of Paediatrics	
5.	Sr. Prof & Head Deptt of Medicine	
6.	Sr. Prof. & Head Deptt of Obst. & Gynae	
7.	Sr. Prof & Head Deptt of Orthopaedics	
8.	Sr. Prof & Head Deptt of Chest & TB	
9.	Sr. Prof & Head Deptt of PCCM	
10.	Sr. Prof & I/c Trauma Centre	
11.	Dr.Sukhbir Singh, Assoc. Prof Deptt of Hospital Administration	
12.	Dr. Sonal Chaudhary, Prof. Deptt of Orthodontics, PGIDS, Rohtak	
13.	Officer I/c CSSD	
14.	Officer I/c Kitchen & Laundry	
15.	SDE (PWD) B&R Electrical & PH	
16.	Smt. Ishwanti, Nursing Superintendent	
17.	Dr. Parul Punia, Asstt. Prof Deptt Microbiology	Infection Control Officer
18.	Mr. Kiran Kaur, Jr. Lecturer, College of Nursing	Member
19.	Smt. Njana Kumar, Staff Nurse	Infection Control Nurse
20.	Dr. Aparna, Sr. Prof & Head Deptt of Microbiology	Member Secretary

Detais can be seen in Hospital Infection Control manual which is available separately .

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INSTITUTE OF MENTAL HEALTH

A. Name of the Department : - **Department of Psychiatry**

B. Distribution of Department into Units :- Unit 1, Unit 2, Psycho-Social Unit

C. Faculty: -

Unit 1-

1. Dr. Rajiv Gupta (Sr. Professor & Head, Department Of Psychiatry & Director-Cum-CEO, IMH, UHS, Rohtak)
2. Dr. Priti Singh (Professor)
3. Dr. Purushottam (Associate Professor)
4. Dr. Yogender Malik (Assistant Professor)

Unit 2-

1. Dr. Sujata Sethi (Sr. Professor & Head, Unit 2)
2. Dr. Hitesh Khurana (Professor)
3. Dr. Aparna Goyal (Assistant Professor)
4. Dr. Shipra Singh (Professor)

Psycho-Social Unit-

1. Dr. Rajeev Dogra (Professor,CP, Head Psycho-Social Unit
2. Dr. Bhupendra Singh (Assistant Professor PSW)

D. OPD Days:-

Unit-I	-	Monday-Wednesday-Friday
Unit-II	-	Tuesday-Thursday-Saturday
PsychoSocial Unit	-	Monday To Saturday

State Drug Dependence Treatment Centre:-

SDDTC has been a resource centre for the State and is having DTC liaison with NDDTC AIIMS New Delhi.

Faculty:-

1. Dr. Sidharth Arya (Assistant Professor)
2. Dr. Vinay Kumar (Assistant Professor)
3. Dr. Sunila (Assistant Professor)

OPD days:- Monday-Tuesday-Friday

E. IPD (Indoor Patient admission):-

Ward No. 13, SDDTC Ward

F. Facilities in the Department:-

- Patient with various Psychiatric disorders are seen in Psychiatry OPD and admitted in Ward-13 as and when needed.
- Emergency Psychiatry services 24X7 Hours.
- Psychology Services in the form of assessment and intervention & PSW services in the form of family interventions & Resource Mobilization for Rehabilitation of the patients at OPD level as well as Indoor.
- Disability assessment for the purpose of Social benefits schemes run by Government.
- **Special Clinics:-**
    - Tuesday:- Geriatric Clinic (Dr. Hitesh Khurana)
    - Thursday :- Headache Clinic (Dr. Purushottam), Behavioral Addiction Clinic (Dr. Sidharth Arya & Dr. Sunila)
    - Saturday :- Child Guidance Clinic (Dr. Sujata Sethi)
    - Saturday :- Dual Diagnosis Clinic (Dr. Priti Singh)
    - Saturday :- Tobacco Cessation Clinic (Dr. Vinay Kumar)
    - Monday to Saturday:- Consultation Liaison Clinic (Dr. Yogender Kumar Malik)
- Teaching and Training of Under Graduate students, Post Graduate students of Psychiatry & students of M-Phil Psychiatric Social Work.

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DEPARTMENT OF MEDICINE

Annexure A

A. ***Distribution of department into units*** :- Seven Units

(i) Medicine-I to Medicine-VII.

B. Details of faculty unit wise.

Unit	Faculty
Unit-I	Dr. V.K.Katyal, Sr. Prof. & Head of Medicine Dr. Sandeep Goyal, Assoc. Prof. Dr. Vikas Bhatti, Asst. Prof
Unit-II	Dr. H.K.Aggarwal, Sr. Prof. & Unit Head Dr. Jasminder Singh, Assoc. Prof. Dr. Jyoti, Assoc. Prof. Dr. Deepa Asst. Prof.
Unit-III	Dr. Harpreet Singh, Sr. Prof. & Unit Head Dr. Anubha Garg, Assoc. Prof.
Unit-IV	Dr. Rajesh Rajput, Sr. Prof. & Unit Head Dr. Mohini, Assoc. Prof. Dr. Nidhi Yadav. Asst. Prof.
Unit-V	Dr. Sudhir Kumar Atri, Sr. Prof. & Unit Head Dr. Sanjay Fotedar, Assoc. Prof Dr. Manjri, Asst. Prof.
Unit-VI	Dr. Tarana Gupta, Sr. Prof. & Unit Head Dr. Surender Kumar, Asst. Prof.
Unit-VII	Dr. Deepak Jain, Assoc. Prof. & Unit Head Dr. Shaveta, Asst. Prof

C. ***Detail of OPD/ Ward day's unit wise***.

Unit	OPD Days	Ward Days
Unit-I	Monday & Thursday	All days of Week
Unit-II	Tuesday & Friday	
Unit-III	Wednesday & Saturday	
Unit-IV	Monday & Thursday	
Unit-V	Monday & Thursday	
Unit-VI	Monday & Thursday	

D. Services provided by the department including special clinics and SOPs followed in OPD consultation, admission, treatment and discharge of patients run by the department with days.

(i) Speciality clinics run by Medicine Department.

Special Clinics	Days	Consultants	Unit	Services provided
Cardio Vascular Clinic	Wednesday Saturday (ICCU/25 Ward)	Dr. VK Katyal Dr. Vikas Bhatti	Unit- I	1. For regular follow up of patients registered 2. For new registration of patient discharged from ICCU 3. Echo Cardiography, TMT,
Gastroenterology Clinic	Saturday (New OPD Room No-141)	Dr. Sandeep Goyal		Hepatobiliary & GE, Endoscopy (Diagnostic & Therapeutic), Colonoscopy, Fibroscan.
Nephrology Clinic	Monday Wednesday	Dr. HK Aggarwal Dr. Jasminder	Unit-II	Kidney & Dialysis, Renal Biopsy, hemo-dialysis, continuous Renal Replacement Therapy, Peritoneal Dialysis.
	Saturday	Dr. Deepak Jain	Unit-VII	
Rheumatology Clinic	Tuesday Thursday	Dr. Harpreet Singh Dr. Anubha Garg	Unit-III	Evaluation of connective tissue disorders (CTD)
Hematology Clinic	Wednesday (Ward No. 23)	Dr. Sudhir Kumar Atri	Unit-V	-Born marrow aspiration Biopsy -Chemotherapy treatment for various Haematological disease Lymphonia, Leukemia, Myeloma etc.
Hepatobiliary Clinic	Tuesday	Dr. Tarana Gupta	Unit-VI	Hepatobiliary & GE, Endoscopy.
PAC Clinic	Daily	Residents of all Medicine units		Pre Anesthesia checkup
Geriatric Clinic	Monday Thursday	Residents of all Medicine units		For Senior citizens

(ii) Other Services:-

Services	Days	Consultants	Unit	Services provided
Endocrinology	Monday Friday	Dr. Rajesh Rajput Dr. Mohini	Unit-IV	Insulin induced hypoglycemia, clonidine stimulation test for evaluation of short stature, ACTH stimulation test for adenocortical disease, Biopsies of various organs like adrena glands.
Endoscopy	Wednesday Saturday	Dr. Tarana Gupta	Unit-VI	Endoscopy (Diagnostic & Therapeutic), Colonoscopy, Fibroscan.
	Tuesday Friday	Dr. Sandeep Goyal	Unit-I	
GI Emergency Days	Wednesday Saturday	Dr. Tarana Gupta	Unit-VI	Hepatobiliary & GI.
	Monday Friday	Dr. Sandeep goyal	Unit-I	
ART Centre	Daily	Dr. VK Katyal (Nodal Officer) Dr. Deepak Jain (Asst. Nodal Officer)		HIV patients registered and treated.

(iii) ***OPD: -*** Medicine OPD is run by all units of Medicine department as conveyed in information given at serial number C above. The patients who come to medicine OPD are registered online, after being registered they are allocated to various units on a particular day. The new patients are equally divided among the units on duty whereas the old patients are seen by the units who are already seen by these units. The OPD consultation is provided by Consultants, Senior Residents & Junior Residents posted on a particular day. The admission of patient is screened by the consultant on duty in Medicine OPD before they are sent to the wards, remaining patients are advised investigations and treatment from the OPD and reviewed as per need. Patients requiring consultation from other specialties including super-specialties are referred from the OPD.

(iv) ***IDP***:- All patients who are admitted in ward of a respective unit who has seen the patients in OPD are then fully evaluated, investigated and treated in various ward of the Medicine. The patients are discharged after stabilizing the condition of the patient and follow up of these patients again carried out in Medicine OPD.

E. ***Duties of Consultant, Senior Resident & Junior Residents***.

(a) Duties of Consultant :

(i) Consultants are responsible for management of OPD, speciality clinics, IPD and various critical care areas in their respective units. Also provide consultation to patients of other specialities.

(ii) They supervise senior residents, junior residents, Interns for their teaching and training purpose.

(iii) Teaching & training of Undergraduate (MBBS) Medical students, Interns/ Postgraduate Medical students as well as BPT/BDS/Bsc. Nursing students so as to achieve the Educational Objectives i.e. to develop their knowledge, skills & attitude as laid down in curriculum.

(iv) Conducting various examinations (MD, MBBS, BDS, and BPT etc) in the department and also participate in conduct of Medical Examinations of other State Health Universities / National Board as an External Examiner.

(v) Consultants are involved in carrying out various duties allocated by Pt. BD Sharma University of Health Sciences, Rohtak.

(vi) Any other duty/task/work assigned by any higher authority like Director, Dean, Medical Superintendent, Head of the Department from time to time; either in "Public Interest" or in the interest of upkeep / development of the Department / Institutions.

(vii) To perform all such duties to ensure continued improvement in the quality of medical Education and Research.

(viii) To conduct Research Projects- clinical research, clinical trials of drugs etc. and contribute to medical knowledge by scientific paper publications in indexed journals & their presentation at various local / state / international Conferences.

(a) **Duties of Senior Resident**:

(i) Senior residents are entrusted with responsibility of supervising Junior Residents for their duties as laid down in the department.

(ii) To assist the Assoc.Prof/Prof./Heads of department in complete management of a full time unit including training & supervision of Junior Residents, Interns and Undergraduate students in such a way that helps in patient care there is no breach/ violation/ infringement of any Act/ code for governing practice of Medicine to the best of their ability as per practices laid down by institution.

(iii) They are responsible for carrying out duties in OPD, IDP and speciality clinics.

(iv) They are providing consultation to various other specialities in both routine and emergency hours. It is binding to attend the Emergency cases as and when required when beyond duty hours.

(v) They are involved in UG and PG teaching program as per schedule.

(vi) Entrusted with file work including MLC opinion on file and court as directed.

(b) **Duties of Junior Resident**:

(i) Junior residents are entrusted with the responsibility of management and care of patients admitted in respective units of Medicine department under direction from senior residents and consultants.

(ii) Carrying out various round orders, recording, maintenance and deposition of IPD patient record.

(iii) They do emergencies duties in Accident & Emergency deptt., ICCU, MICU and in the wards round the clock.

(iv) Dialysis services in Nephrology section also managed by the Junior Residents.

(v) Junior Residents work in various OPD/Speciality clinics/Geriatric OPD/PAC/ART centre and other labs runs by the department of Medicine.

(vi) Apart from performing their duties, they are also involved in various PG and UG teaching program of the Medicine Deptt.

(vii) Junior Residents are also involved in research activities in the department.

F. <u>Responsibility of emergency care and elective care including emergency operations and elective Surgeries.</u>

<u>Emergency Care:</u>

1.Accident & Emergency: Post graduate residents of the Medicine are posted in A&E department round the clock on emergency duty of a particular unit. Another unit provides residents as well. The posting are as per roster of a unit.

Morning – 1st year/2nd year Post Graduates (02 Residents)
Evening- 2nd year/3rd year Post Graduates (02 Residents)
Night- 2nd year/3rd year Post Graduates (02 Residents)

The Senior resident and consultation on call duty provides cover round the clock as well.

2. <u>ICCU</u>: ICCU of Medicine department caters to Cardiac emergencies, coming to Accident & Emergency, round the clock as per SOP attached herewith. Residents on duty also provide Cardiology consultation on their days to other speciality.

<u>SOP ICCU/25 Ward (approved vide letter no. PGIMS/Misc/18/2036-52 dated 09.04.2018)</u>

Intensive Coronary care unit (ESTABLISHED 1976) is currently being run by Department of Medicine under the charge of Sr. Prof. & Head, Department of Medicine, PGIMS, Rohtak. This service caters to Cardiac emergencies, coming to Accident & Emergency, MOD & other wards of PGIMS, Rohtak. ICCU of medicine is allocated 3 days in a week namely Monday, Thursday and Saturday and all Sunday for the admission. In the remaining days, emergencies are officially designated for the admission to department of Cardiology, PGIMS, Rohtak. The following are the SOPs being adopted in ICCU, Medicine Department.

(i) Infrastructure: ICCU has 12 advanced care beds with 12 oxygen and suction ports. In addition, it has one interactive central station, 12 bed side monitors, & one slave monitor for doctor's duty room. These monitors provide round the clock cardiac monitoring of patients with facilities for pulse oximeter, NIBP, Invasive blood pressure monitoring and cardiac output estimation in some beds. In addition, ICCU also has the facility in defibrillation, temporary venous cardiac pacing, bed side Echocardiography, infusion and syringe pumps and ECG machines. The infrastructure also has resuscitation trolley, glucose monitoring and nebulisation facilities. This ICCU is managed by trained staff nurses (ratio 1:2), 2nd& 3rdyear Medicine residents, Senior resident and Consultant round the clock.

(ii) Admission :All patients come to A & E, MOD, wards with following conditions-

- Acute coronary syndrome (Unstable Angina, NSTEMI, STEMI)
- Acute decompensate Heart failure
- Life-threatening cardiac arrhythmias (atrial fibrillation, PSVT, VT/VFIB)
- Conduction blocks

- Massive pericardial effusion
- Massive pulmonary embolism
- Acute pulmonary oedema
- Cardiogenic shock.
- Acute Myocarditis
- Misc- PM rupture, Acute MR, Hypertension urgencies & Emergencies & others

(iii) Procedure for Admission:All patients are referred from A&E or Medicine OPD to admission on undergo following:

1. These are immediately examined by residents on duty, informed consent taken and the record of the clinical examination is made in the history sheet.
2. Patient is connected to Bedside Monitor, Defibrillator kept ready, IV access established
3. ECG is done immediately and serial ECG are done on the day of admission, at 30 minutes, 90 minutes and morning and evening subsequently.
4. Blood Biochemistry, cardiac biomarkers & portable skiagram chest are available in emergency Biochemistry lab are immediately ordered and patient is started on treatment.

   The general treatment guidelines include-

(a) General measures which include oxygen therapy to maintain 95% SpO2, ECG monitoring and narcotic sedation.

(b) Subsequent measure depending on the diseases are carried out. Following measures are immediately carried out if Acute coronary syndrome is admitted;

1. Nitroglycerin Intravenous, Beta blockers, calcium channel blockers and other anginal drugs as and when indicated.
2. Dual Antiplatelet therapy with aspirin 325 mg and P2y12 inhibitors- clopidogrel 300 mg stat started immediately.
3. Anti coagulant therapy with LMWH and UFH started immediately.
4. Thrombolytic is therapy includes first generation agents and 3rd generation depending upon the choice of the patient. Therapy preferred if available on institution Rate contract.
5. After 24 hours the patient is shifted on oral drugs and mobilisation within ICCU is carried out.

Generally, the patient is shifted out of ICCU after 48 hours of intensive management in ICCU. For all other Cardiac Emergencies, standard International/national available guidelines are followed.

(iv) Urgent Cardiology opinion/Intervention:

If urgent coronary intervention or other cardiac procedure is indicated. if available in Cardiology department, it is offered to the patient after seeking consultant opinion from Deptt of Cardiology.

(v) Discharge: After starting oral medication, life style modifications counselling, the patient is discharged and put on

long term follow up service on CARDIOVASCULAR CLINIC which is also run by Department of Medicine. In CVC, the patients are allocated unique CVC number & all ICCU data is duplicated in separate file, these patients are regularly followed up subsequently for years.

(vi) Indications for Referral-Following are the indications of referral which are followed at present in ICCU. All such patients are referred to Department of Cardiology/CTVS, PGIMS, Rohtak

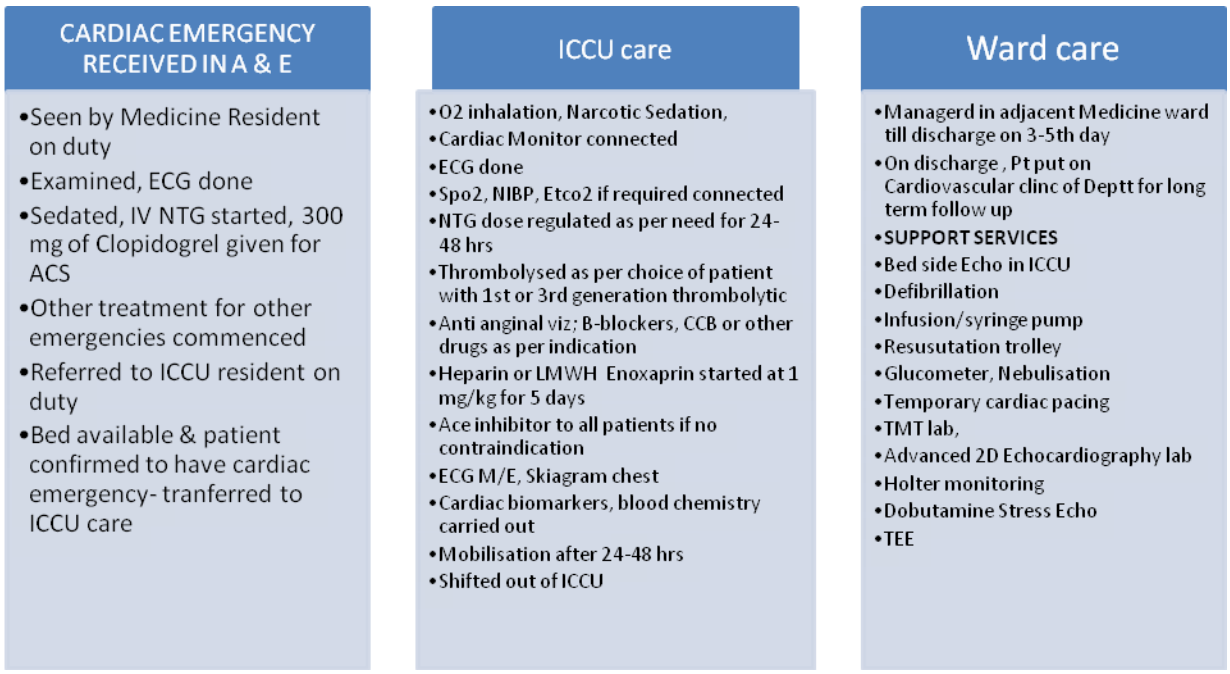
- Coronary artery bypass grafting (CABG)
- Percutaneous coronary intervention (PCI) and stenting.
- Inta-aortic balloon pump counter pulsation (IABP)
- Pacemaker (Permanent)
- ICD (Implantable cardioverter- defibrillator)
- RF Ablation
- CRT (Cardiac resynchronization therapy)

(vii) Support services for ICCU

Following support services are created and available for discharged patients:

a. Tread mill test
b. Advanced 2-D echocardiography
c. Holter monitoring
d. Dobutamine stress Echocardiography
e. Transoesophageal echocardiography

FLOW CHART OF ADMISSION AND DISCHARGE FROM ICCU, DEPARTMENT OF MEDICINE, PGIMS, ROHTAK.



Viii). MICU (06 bedded in each ward): In all Medical ward facility of 06 Nos high dependency bed with cardiac monitoring and 02 Nos ventilators are available. Critically sick patients are shifted to MICU as and when needed.

ix). Medicine Ward: Emergencies admission in respective Medicine units is managed by consultants and Residents of that unit.

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DEPARTMENT OF MICROBIOLOGY

1. DETAIL OF FACULTY AND LAB INCHARGES

SR.NO.	FACULTY	QUALIFICATION	DESIGNATION	LAB INCHARGE
1	Dr Aparna	MBBS MD	Sr.Professor & Head	TB Lab
2	Dr Rama Sikka	MSc PhD	Professor	Media Room
3	Dr Madhu Sharma	MBBS MD	Professor	Blood Culture Lab & Emergency Lab
4	Dr Nidhi Goel	MBBS MD	Professor	Mycology Lab & OPD Lab
5	Dr PS Gill	MBBS MD	Professor	Virology Lab
6	Dr Antariksh Deep	MBBS MD	Professor	Bacteriology Lab
7	Dr Kiran Bala	MBBS MD	Professor	Serology Lab
8	Dr Ritu Aggarwal	MBBS MD	Professor	HIV Lab
9	Dr Parul Punia	MBBS MD	Assit. Professor	Parasitology Lab & Truma Centre Lab Infection Control Officer

2. Facilities available/Services provided : Following investigations are available in the department of Microbiology

1) Urine culture & sensitivity
2) Pus culture & sensitivity
3) Blood culture & sensitivity
4) Sputum culture & sensitivity
5) Body Fluids culture & sensitivity
6) CSF culture & sensitivity
7) Stool culture & sensitivity
8) HVS culture & sensitivity
9) OT swab culture
10) Fungal culture
11) Culture for M.tb
12) Bacteriological testing of water samples
13) Stool M/E
14) Gram Staining
15) ZN Staining
16) KOH wet mount for fungus

17) India ink for CSF
18) CRP Test
19) ASO test
20) RA Factor
21) Widal Test
22) VDRL/RPR Test
23) HIV Antibody Test
24) HBsAg ELISA
25) HCV Antibody Test
26) RT-PCR for HBV, HCV, Influenza A (H1,H1N1,H3), Influenza B (Victoria & Yamagata) and Viral meningitis panel
27) Dengue Serology
28) Chikungunya Serology
29) PBF for MP
30) GeneXpert for TB
31) CD4 count for HIV
32) Anti-CCP
33) tTG IgA
34) Anti DsDNA
35) ANCA
36) p-ANCA

3. Standard Operative Procedures

S.No.	Investigation	Sample	Test Method
1	Urine C/S	Urine	Microscopy, culture, identification and antibiotic sensitivity testing by conventional
2	Pus C/S	Pus	Microscopy, culture identification, and antibiotic sensitivity testing by conventional method
3	Blood C/S	Blood	Culture, identification and antibiotic sensitivity testing by conventional method
4	Sputum C/S	Sputum	Microscopy, culture identification, and antibiotic sensitivity testing by conventional method
5	CSF C/S	CSF	Microscopy, culture identification, and antibiotic sensitivity testing by conventional method

6	Body Fluids C/S	Pleural fluid, Peritoneal fluid, Synovial fluid, Ascitic fluid etc	Microscopy, culture identification, and antibiotic sensitivity testing by conventional/automated system
7	Stool C/S	Stool	Microscopy, culture identification, and antibiotic sensitivity testing by conventional system
8	HVS C/S	High vaginal swab	Microscopy, culture identification, and antibiotic sensitivity testing by conventional method
9	OT swab culture	OT swab	Microscopy, culture & identification
10	Fungal Culture	Skin & corneal scrapings, hair,nail,blood, sputum, eye swab, tissue etc	Microscopy , culture & identification
11	Culture for M.tb	Sputum, BAL,tracheal aspirate,urine, endometrial tissue,other fluids	Microscopy & culture
12	Bacteriological testing of water samples	Water	Multiple tube test
13	Stool M/E	Stool	Microscopy for ova/cyst, cellular exudates
14	CRP, ASO, RA Factor	Serum	Latex agglutination
15	Widal Test	Serum	Tube agglutination
16	VDRL/RPR Test	Serum	Slide flocculation
17	Anti-CCP,tTG IgA,Anti DsDNA, ANCA, p-ANCA	Serum	ELISA
18	HBsAg, HCV Antibody & HEV IgM	Serum	Rapid and ELISA
19	Antibodies for Scrub Typhus, Leptospira	Serum	ELISA

20	HBV DNA and HCV RNA	Serum	Real Time PCR
21	Dengue serology, Chikungunya serology	Serum	NS-1 Ag and IgM ELISA
22	Antibodies for Measles	Serum	ELISA
23	Influenza A & B	Nasopharyngeal and throat swab	Real time PCR
24	HIV test	Serum	Rapid and ELISA
25	PBF for MP	Blood	Microscopy of thin smear
26	GeneXpert for TB	Sputum, BAL,Pus,Pleural fluid etc	Real Time PCR to detect Rifampicin resistance
27	CD4 count for HIV	Blood	FACS machine
28	Viral meningitis panel	CSF	Real time PCR

4. **ICTC, HIV Laboratory**

Department of Microbiology, PGIMS, Rohtak.

INTRODUCTION- The term ICTC is an abbreviation for Integrated Counseling and Testing Center for HIV. This center is located in the Room number 322 & 323, Second Floor, Microbiology Department, PGIMS, Rohtak. This center works according to the guidelines issued by the National AIDS Control Organization (NACO). This document describes all the procedures followed at the center.

SCOPE- This center provides the following services to the walk in clients (both voluntary & referred) and indoor patients-

a) Counseling of the client
b) HIV testing

PROCEDURE

Pretest counseling- Pretest counseling is provided by the counselor in room 323 to all walk in clients visiting the ICTC. Knowledge of the client about HIV/AIDS is assessed and the basic information regarding HIV/AIDS is provided to the clients. Confidentiality at each step is ensured and written consent is taken. Unique patient identification number (PID) is assigned and client card is issued to all voluntary walk in clients along with duly filled HIV test report Performa. Details of all referred walk in clients who visit the ICTC along with already filled hospital requisition slip for HIV testing are entered in the register. All these clients are then sent to the Room number 322 for sample collection and HIV testing.

Sample- HIV test is performed either on the serum or whole blood depending on the availability of the test kit and the client/patient.

Whole blood- Whole blood is collected by finger prick at the center by the laboratory technician. This procedure is done on walk in clients both voluntary and referred.

Serum- Serum is separated from the blood sample in the ICTC laboratory. The blood sample is collected by venepuncture, at the center by Laboratory technician in case of walk in clients both voluntary and referred or by hospital staff for indoor patients which is then transported to the laboratory.

Procedure- At ICTC HIV testing is performed using NACO strategy III, using as many as three different test kits for antibody detection against HIV, based either on different antigens or different principles.

Report Generation- Report is generated as per the format provided by the NACO in case of direct walk in voluntary clients and in the hospital requisition slip in case of walk in referred clients and indoor patients. Technical staff and doctor on duty sign the report.

Dispatch of report- Signed report is sent confidentially to the counselor. The counselor gives report to the respective walk in client after post test counseling. Non reactive report of indoor patient is distributed by the departmental bearer along with other departmental test reports to the respective ward. In case of reactive report of indoor patient, counselor visits respective ward and hands over the report to the patient after post test counseling.

5.UG and PG Teaching

a) Teaching of following undergraduate courses is undertaken by the department in the form of Theory lectures, Tutorials and Practicals
   - MBBS
   - BDS
   - BSc Nursing
   - BPT
   - BSc Optometry
   - BSc Perfusion Technology
   - BSc MLT

b) Teaching of Postgraduate Students is carried out in the form of Seminars, Practical Discussions and regular written tests.

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DEPARTMENTO OF NEPHROLOGY

SOPS IN NEPHROLOGY DEPARTMENT, WARD NO. 28 & 34:

Admission:(1) Patients are admitted from the Nephrology clinic on Monday/Wednesday/Saturday as also shifted from Ward No. 10/II & 10/VII after stabilization.

Dialysis : Unit 10/II & 10/VII attend to calls for nephrology consultation from all the departments of PGIMS, Rohtak and patients requiring dialysis are advised to get dialysed in the dialysis centre under the department. The dialysis is facilitated by the unit 10/II along with house surgeons (Nephrology department) and dialysis technicians and other nursing staff of the department. There are facilities of hemodialysis, peritoneal dialysis & CRRT.

The patients after dialysis are sent back to their respective wards if admitted. The dialysis services are also offered to stable patients as day care service where patients are given their appointment for dialysis.

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DEPARTMENT OF NEONATOLOGY

FACILITIES AVAILABLE/ PROTOCOLS/SERVICES PROVIDED

The Department of Neonatology is located in newly built mother and child hospital and old hospital building. Neonatology department is the apex neonatology centre which provides tertiary level care to the sick newborns. The department is well equipped with all tertiary level care instruments like high end neonatal ventilators, cerebral function monitors, ultrasound cum echo machine, high flow nasal cannula, CPAP, transport incubators and T piece resuscitators etc. Also Kangaroo Mother Care Unit of the department is one of the largest unit of the state taking care of pre term and low birth weight neonate. The department provides excellence in clinical care, training and research.

1. The Department of Neonatology has :

- (Total 63 beds)
- 5 NICUs: NICU I, NICU II, NICU III, NICU IV, LR NICU (51 beds)
- KMC (12 bedded)
- MNCU: (10-12 bedded) under construction

2. List of Faculty

SR. NO.	NAME	DESIGNATION	QUALIFICATION
1.	Dr. Jagjit Singh Dalal	Assoc. Prof & Head	MD, DM(Neonatology)
2.	Dr. Sandeep Jhajra	Asstt. Professor	MD, DM(Neonatology)

3. **Neonatology OPD** [Outpatient] services are available on Wednesday and Friday on the second floor of the new 'Choudhary Ranbir Singh OPD block'. The department staff available for consultation includes consultants, Senior Resident and junior residents. All GOI recommended vaccines are given in the immunization clinic Room No 206.

4. The following specialty clinics are being run

a. New born Follow up clinic(NFC) for High risk Neonates every Wednesday Room No 218

b. Well Baby Clinic (WBC) every Friday, Room No. 203, 2nd floor.

5. The standard Operating Procedure applicable to Neonatology is being followed. Department of Neonatology currently have 05 Neonatal Intensive care units [NICUs] with 51 beds and also have 12 bedded KMC unit. NICUs are well equipped and staffed with availability of trained doctors round the clock. Facilities for new born resuscitation, intensive phototherapy, exchange transfusion, surfactant therapy, ventilation, CPAP, total parental nutrition is available. Facility for therapeutic hypothermia for babies with severe asphyxia is available.

All critically sick neonates are admitted initially in NICU I, NICU II & LR NICU. Babies with sepsis setting are admitted to NICU I and with no sepsis setting are admitted to NICU II & LR NICU. Those babies who become stable and are less sick are transferred to NICU III & NICU IV which is step-

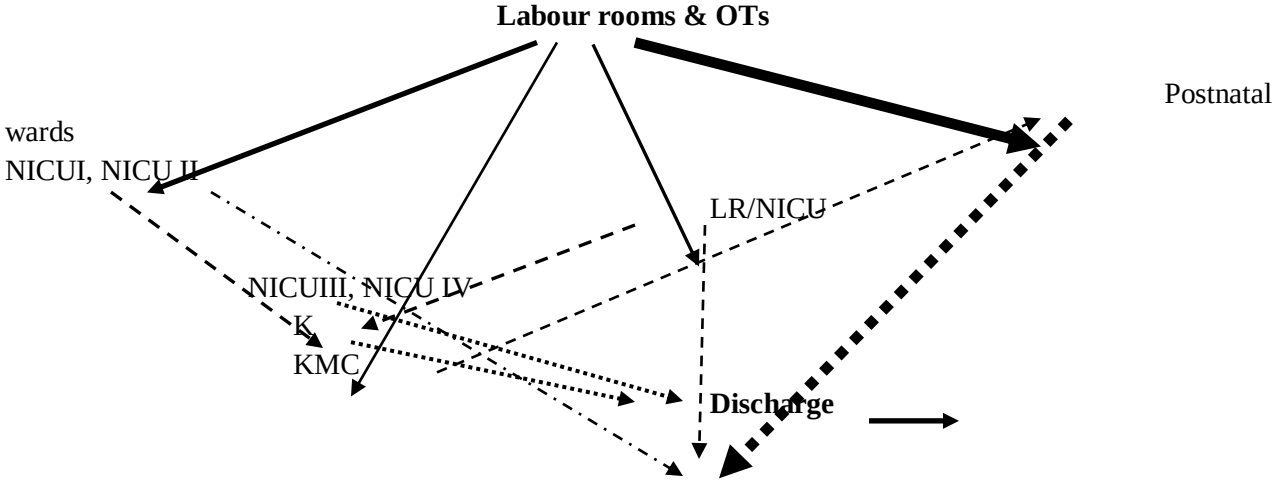
down NICUs at present. The babies from NICU III & IV who are not on any respiratory support and need Kangaroo Mother Care shifted to KMC unit. The sicker babies in NICU are managed by senior PGs and Senior Residents

Postnatal wards

- The stable babies with uneventful course are transferred to their mother in postnatal wards remains in postnatal wards with mother till discharge.

- Apart from the major bulk of babies in ward 2 and MCH, some babies are also transferred to special wards and ward 8 etc. Each and every baby needs to be assessed; by junior resident pediatrics posted, during the round and relevant finding should be entered in the babies file. The postnatal rounds are to be completed by resuscitation resident on night duty and written hand over passed to the day resident. All newborns admitted in private wards are to be seen by senior resident.

Areas of Admission for neonates and their flow The Neonatology department is broadly divided into various areas. The usual flow of babies in these areas is as below:



Note:

The weights of arrows roughly indicate the proportion of the newborn load.

Dashed arrows indicate the flow while stepping down the care in an improving baby.

Discharge and follow-up policy

- Healthy asymptomatic newborns can be discharged once they pass urine and stool and their breastfeeding is established, after ensuring dose of BCG, OPV and Hepatitis B. Babies with potential incompatible blood group settings are not discharged during first 48-72 hrs of life. Asymptomatic preterm's and SGAs can be discharged once they are on full breast/spoon feeds, there are no acute issues and they weigh >1400 grams with consistent weight gain.
- The discharge slip should contain the relevant antenatal, birth and postnatal details, immunization status, weight, length and head circumference (birth & discharge),feeding advice, supplements, date

and venue of next follow up, danger signs and specific plan in follow up (ROP, BERA, neuroimaging etc).

- ***Following babies need to be followed in NFC clinic (****Wednesdays, 10 AM in winters and 9 AM in summers, R no 218).*
    - <34 weeks OR <2000 grams at birth
    - Meningitis/Severe sepsis/shock
    - Received mechanical ventilation
    - Hypoxic Ischemic encephalopathy stage 2 or higher
    - Major malformation
    - Inborn error of metabolism/chromosomal or genetic disorders/intrauterine infections
    - Symptomatic hypoglycemia
    - Symptomatic polycythemia
    - Retrovirus positive mother

      Hyperbilirubinemia requiring exchange transfusion OR Rh. ABO isoimmunization/cholestasis/S.bil>18mg/dl

      Abnormal neurological examination at discharge/seizures

      Major morbidities such as chronic lung disease, IVH grade III or more (Papile's classification), and periventricular leucomalacia
- All healthy term asymptomatic newborns should be called at 6 weeks of age for next immunization as well as examination in **well baby clinic** on Friday (room no 203, *10 AM in winters and 9 AM in summers*)

- The follow up care is planned right before the discharge of the baby from the hospital. Following is the checklist is followed before discharge of any newborn.
- ROP proforma duly completed with all required details and the date of first screening to be handed over to parents of the newborns.
- Discharge slip with detailed diagnosis, course in hospital, key investigations, treatment, and vaccination, condition at discharge, anthropometry and plan during follow up.
- Neuroimaging: Ultrasound head of all babies <1500 grams, <32 weeks of gestation at birth and those with any neuromorbidity, to be performed before discharge. Date should be taken before discharge for those requiring MRI, as decided by consultant.
- Vitamin supplements should be started and clearly explained to the parents.

6. Duties of consultant, senior resident and junior residents: Total of 10 pediatrics MD residents are posted in Neonatal ICU, Resuscitation area to provide day and night cover for care of newborns. Junior residents are working and looking after the sick new born babies in all areas along with Senior Residents. Consultant take morning and evening round daily as per roster and also available 24 hour on call

7. Emergency care and elective care: All the deliveries and caesarean are attended by either senior resident, junior resident or both

8. Immediate emergency services are available in Paediatric casualty 24 X 7 where all facilities for resuscitation and managing sick new born are available. It has 10 beds and 2-3 qualified doctors (SR & JR)are available round the clock with consultant care always available on call. Also all the resuscitative care is given to all the deliveries for the inborn babies by Junior Residents and Senior Residents.

9. UG PG Teaching programmes:

a. UG Teaching:

UG Teaching starts from second prof with theory and clinical exposure in ward. Theory classes related to neonatology topics of UG curriculum of Pediatrics are taken by consultants of Neonatology department.

The ward clinical case presentation and OPD classes of UGs taken by consultants of Neonatology are taken as per teaching roster.

b. PG Teaching:

Bedside teaching of Postgraduates of Paediatrics posted in Neonatology done on daily basis as well as PG teaching like seminar, general club, clinical case discussion, didactic lectures and college CPC done as per roster.

Hospital round by faculty: Consultant take morning and evening round daily as per roster

10. Any other services provided by the department:

a. Lactational counseling of postnatal mothers by lactation counsellor.
b. Breastfeeding week celebration every year.

11. Future plan for the department

a. To start MNCU (Mother and Neonatal Care Unit)
b. To commence DM OR DNB Neonatology course
c. To establish human mother's milk bank
d. To develop tele neonatology facilities

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DEPARTMENT OF NEUROSURGERY

1. Department of Neurosurgery.

2. Detail Of faculty :-

   - Dr. Ishwar Singh Sr. Prof. & Head
   - Dr. Amar NathAsstt. Professor.
   - Dr. Gopal Krishna Asstt. Professor.
   - Dr. Varun Kumar Aggarwal Asstt. Professor.

3. Detail of OPD/OT /Ward days:-

- OPD services – Monday, Wednesday & Friday.
- OT services – Mon, Tue, Wed, Thu, Fri & Sat.
- Indoor Services – All days
- Emergency Services – All days
- ICU Services – All days.

Neurosurgery department is situated in Lala Shyam Lal Superspeciality Centre of Health University Complex. It is catering to all the neurosurgery referral patients of Haryana and surrounding areas. Patients of different neurosurgical diseases like brain and spinal tumors, vascular malformations, hydrocephalus, infective diseases, traumatic brain injury and spinal injury and spinal degenerative diseases are treated. There are total 4 faculty members and 6 senior residents in the department. Neurosurgery department has 36 beds including 6 ICU beds (including 2 ventilated beds) 20 general beds in LSL building and 10 beds in trauma centre
In our institute, patient care in neurosurgery practice can be divided into three separate categories.

1. Trauma care
2. Outdoor patient care
3. Indoor referral and emergency patients

Trauma Care Management

In Dhanvantari Apex Trauma centre 4 consultant neurosurgeons and 6 senior residents are posted on rotational roster basis. In trauma ICU there are total 21 beds including 10 ventilated beds, running under supervision of dedicated critical care team of anesthesia department. Routine blood investigation lab and radiological investigation facilities are available round the clock. 24 hrs Blood bank facilities and fully equipped OT complex having 5 operating rooms (one dedicated Neuro OT) are available for operative patients. There are 10 dedicated neurosurgical beds in 45 bedded trauma ward supervised by resident doctor and nursing staff.

Trauma protocol

- Patient at Trauma centre are received by GDMO and assessed by trauma team and admitted to respective surgical unit as per protocol.
- After ensuring cardiopulmonary stabilization in trauma emergency room **neurosurgery team examines the unconscious patients, patients having neurological deficit and penetrating head injury patients.**
- Relevant investigations (non contrast CT brain for suspected head injury and non contrast CT spine for suspected spinal injury) are evaluated.
- Complete clinicoradiological evaluation leads to decision of conservative or operative management.
- Conservatively managed patients continue to get care in respective admission unit, are regularly monitored and discharged in stable condition.
- Operative management- patients requiring operative management are shifted to OT.
    - Informed written consent with explained risks/benefits to patients is followed with attendants/ patient
    - Relevant blood investigation and blood for transfusion arranged before patient is shifted to OT complex.
    - Surgical procedure performed as per requirement by Senior resident/ Duty consultant
    - From OT complex patient is initially shifted to trauma ICU/ward. After stabilization patient is shifted to Neurosurgery ward from where patient is discharged in stable condition.

Outdoor patient care

Neurosurgery OPD is situated at 2nd floor, ChRanbir Singh OPD complex, room no 227,229. Patients are seen on OPD basis three days per week (Mon, wed, Fri).

Patients requiring operative management are explained about the procedure and preanaesthetic workup is done in consultation of PAC clinic Ground floor room no 56 OPD block. After full preparation provisional date of admission is given on first come first serve basis and patients are admitted in Neurosurgery ward.

Department has fully equipped Neurosurgery OT complex in LSL block ground floor(6 days in a week Mon, Tues, wed, Thurs, Fri & Sat), where all surgeries for Brain tumors, aneurysms, vascular malformation, hydrocephalous/shunt procedures, endoscopic surgeries, traumatic spinal injury and compressive myelopathy disease are operated.

Emergency calls are divided as

1. Patients received in emergency are followed by senior resident on duty. In consultation with consultant on call, management is decided as per requirement.
2. Calls from admitted patients in various hospital ward are received in neurosurgery ward and are followed by senior resident on duty. In consultation with consultant on call, management is decided as per requirement.

Mch. Services:- The department of Neuro Surgery is also having super specialties teaching programme. (Mch.)

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DEPARTMENT OF NEUROLOGY

Details of Faculty

1. Dr. Kiran Bala, Sr. Prof. & Head, Neurology
2. Dr. Surekha Dabla, Sr. Prof. Medicine

1. **OPD Services** being provided twice a week. (Every Wednesday & Friday) in R.No.129 & 141 in Ch. Ranbir Singh OPD
2. **Speciality Clinics**
   a) Cognitive Disorder Clinic - Every 1st & 3rd Monday in R. No.141 in Ch. Ranbir Singh OPD.
   b) Movement Disorder Clinic - Every 2nd & 4th Monday in R. No.141 in Ch. Ranbir Singh OPD.
3. **Indoor Services** – There is a twenty bedded ward No.-32 in LSL Super Specialty Centre, B Block, PGIMS, Rohtak. **We are in the process starting Neurology ICU very soon.**
4. **Neurophysiology Lab** – Following tests are being done in Neurophysiology Lab in Room No. 5 LSL Super Specialty Center, B Block, PGIMS, Rohtak.
   1. Digital EEG/Video EEG
   2. Nerve Conduction Velocity(NCV)
   3. Electromyography (EMG)
   4. Visualy Evoked Potential (VEP)
   5. Brain Stem Auditory Evoked Potential (BERA)
   6. Somato Sensory Evoked Potential (SSEP)
   7. RNST
5. **Teaching & Training – Neurology training is being provided to:**
   a) DNB Neurology Super Specialty course has been started since September 2019.
   b) M.D Psychiatry students – Clinical & EEG,EMG & NCV Training
   c) Students of BPT – Theory+ Practical Classes since 2013
6. **Research Work –** Neurology related research is being done in collaboration with Deptt. of PCCM, Psychiatry, Pharmacology ,Clinical Psychology & MDU Research Students.

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DEPARTMENT OF ONCO SURGERY

A. There is single unit.

B. Head – Dr. R.K. Karwasra

Assistant Professor (one) – Dr. Sushil Kumar.

C. OPD Days - Monday & Thursday
OT Days - Tuesday & Friday
Ward Days - Wednesday & Saturday

D. Services provided by Department of Surgical Oncology

a. Outdoor:-

- Assessment of patients for diagnosis of cancer attending surgical out door is done.
- Minor operative procedures like biopsies which are possible without risk of any intra operative complications are performed in Minor OT.
- Dressing of all kinds of wounds is done in Minor OT.
- Any surgical illness that requires opinion/intervention of super-specialty Departments of PGIMS, Rohtak or Higher Government Centres, are done.

b. In door:-

- Patients admitted for sake of conservative treatment are given and monitored accordingly.
- Patients who are admitted for operation are prepared for surgery.
- Regular rounds by various members of the team, morning and evening.
- Patients are referred to Higher Centres for procedure/interventions if they are not amenable in this Hospital at that time.
- Minor procedures are carried out whenever necessary.
- Opinions of different super-specialty are taken whenever necessary.

c. Operation Theatre:-

Patients are subjected to wide variety of cancer surgery which includes Head and neck, breast, gastroenterological, gyaenecological, soft tissue sarcoma, urological and thoracic malignancies.

d. **SOP-**

a. In OPD, the patients are seen by residents and consultants. If residents have some difficulty regarding a particular case, they consult the consultant.

b. The admission is done from the admission list which has been dated for that particular day and at random also.

c. Treatment of elective and postoperative cases is advised by residents and consultants.

d. Discharge of patient from ward is decided after the round of Consultant.

E. **Duties of –**

1. **Consultants**: - Provide consultation with regard to patient care in OPD, Indoor, OT. Do administrative works assigned by Directors Office/ University Administration.. Attending conferences at various levels and presenting papers/ delivering lectures/ oration etc.

2. **Jr. Residents:** - Work under supervision of consultants for patient care and attending conferences at various levels.

F. **Responsibility of :-**

1. Elective care – Consultants with a team of Jr. Residents carry out elective care.
2. Elective Surgeries:- The operation lists are prepared by consultant of the department. The consultant is fully responsible for all the cases on his table e.g. their surgery, postponement etc.

G. Any other information / service provided by the department – Nil

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DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

Location:
Ch Ranbir Singh OPD
First floor Block F

- Gynae OPD room no 176 & 179 to 183
- Obst OPD room no .158 & 159
- Registration room no. 150
- Drug distribution room no. 175
- Counselling room no. 157
- Injection room no. 150
- Minor OT 153
- PPC 154
- Investigation room no**.** 160
- Gynae OPD Office Room no 156
- Colposcopy room no. 177
- USG room no. 178

Only one attendant is allowed with one patient.
Registration time:
Winter: 8:30 AM to 1:00 PM
Summer: 7:30 to 1:30 PM

Process: Registration is done from Obst and Gynae OPD counter on first floor room no. 150.
A unique identification number is given.
Daily 250 to 300 registrations are being done.
The OPD card is having a number for consultation room go to that room and get consultation if any investigation is required go to investigation desk get the form filled from there and go to respective room as instructed.
If any consultation is required from other department patient will be directed for other specialty .
After consultation get the appointment for next visit.
***Preference will be given to aged, sick and cancer patients in queue over new patients*.**
On next visit collect the report of investigations from registration counter on instructed date and go for consultation room in respective room which is indicated on the top of the card.
Available facilities:

1. Antenatal clinic
2. High risk pregnancy clinic
3. Gynaecology clinic
4. Special clinics
5. PPC clinic
6. Minor OT

Unit wise Faculty Distribution of Faculty, OPD, OT, And Ward Days:

UNIT	OPD DAYS	OT days	Ward Days	FACULTY
Unit I	Monday Thursday	Tuesday (MCH OT) Wednesday (Gynae OT) 1st and 2nd Friday 3rd and 4th Saturday (PPC OT) 1st and 2nd Saturday (MCH OT)	All days	Dr. Smiti Nanda Dr Meenakshi Chauhan Dr. Vani Malhotra Dr .Vandana Bhuria Dr Monika Dr Parul Singh Dr Surbhi
Unit II	Tuesday Friday	Monday (MCH OT) Thursday (Gynae OT) Saturday 1st and 2nd Gynae OT Saturday (3rd and 4th MCH OT)	All days	Dr. Daya Sirohiwal Dr. Nirmala Duhan Dr Roopa Malik Dr Pooja Sinha Dr Parul Bhugra Dr Menka
Unit III	Monday Wednesday	Tuesday Saturday (Gynae OT) Thursday (2nd and 3rd MCH OT) Friday (MCH OT)	All days	Dr. Pushpa Dahiya Dr. Krishna Dahiya Dr. Shaveta Dr Latika Dr Shikha Dr Sonia
Unit IV	Tuesday Saturday	Monday (Gynae OT) Friday (3rd and 4th Gynae OT) Wed(MCH OT) Thursday (1st and 4th MCH OT)	All days	Dr Savita Singhal Dr. Anjali Gupta Dr.Neetu Dr. Sarika Gautam Dr smriti Anand

Disclaimer***: information of OPD schedule is of current date and is subjected to change with time and as per rule and available faculty.***

Clinics and OT:

1 Antenatal clinic: room No. 158 and 159

2. High risk pregnancy clinic:

Room no. 158 & 159

It is run along with the antenatal clinic simultaneously and a HRP no. (high risk pregnancy no.) is given which is indicated on the top of the card .

Registration for following cases are being done:

High risk antenatal cases with medical disorder

a. Hypertension

b. Diabetes

c. Respiratory disorder
d. Cardiovascular disorder
e. Renal disorder
f. Liver disorder
g. Immunological disorder.

High risk antenatal cases with obstetrical causes:

a .Antepartum haemorrhage
b. Pregnancy induced hypertension
c. pregnancy with associated infection like
HIV and AIDS
Hepatitis B
Hepatitis C
d. premature rupture of membranes
e. pregnancy with previous caesarean section
f. abortions
g. early pregnancy haemorrhage
h. pregnancy with ABO Rh incompatibility
i. pregnancy with fetal congenital malformation
And others obstetrical complication.

3**. Gynaecology clinic**:

Room no. 176 and 179 to 183
All gynae patients are being dealt in the gynae clinics
Cases seen:
PID,
Prolapse Uterus
Menstrual Problems
Gynaecological cancers
Premalignant lesions and their examination and investigation
Pap smear

4**. Special Clinics:**

We are also running special clinic in every unit on the days prescribed by the respective units .Following clinics are run simultaneously

a. **Adolescent clinic**
b. **Infertility clinic**
c. **Menopause clinic**
d. **Cancer clinic**
e. **PCOS Clinic** first Thursday of every month

5. **Family planning clinic:**

Room no. 154

Consultant: Dr. Sushila Chaudhary (Associate Professor)
Services available: Family planning counselling
Oral contraceptive pills
Emergency pills
Barrier contraceptives
IUCD insertion and removal

Admission for missed IUCD management
Admission for recanalization and ligation.
Admission for MTP

Minor OT:

Room no.153

Timings: Monday to Saturday
10 :00 AM to 1:30 PM
Procedures performed:
Endometrial biopsy
Cervical biopsy
Polypectomy
IUCD insertion & removal

Labour room and Ward Facilites:

We are having 24x7 Obstetrics and Gynaecology casualty which is being run in casualty room of labour room complex.
All patients who came in emergency have to report in casualty room of labour room complex ward 2.
MCH block is having two units of dept of Obstetrics and gynaecology
Unit I 56 beds
Unit IV 48 beds
Ward 2 having two units
Unit II 48 beds
Unit III 48 beds

Department is having two setup of operation theatre

1. MCH OT
2. Gynae OT

Department is having 24 hours operating facility in labour room operation theatre which is situated in labour room complex.
All emergency caesarean section and other emergency surgeries are done there.

Labour room covered by on floor consultants 24 hrs a day

Labour room having 1 senior resident, 8 junior residents, 2 house surgeons and 8 maternity students in one shift.
On an average daily 70 admissions, 30 -35 vaginal delivery , 13 to 15 LSCS, and 25 referred cases are dealt with.

HDU:

Facilities:

Preeclampsia and Eclampsia management
Severe anemia
Medical disorders
High risk pregnancy
Daily Gynae elective surgeries are also done except Sundays and public holidays.
Gynae OT is on second floor of OT complex.
Elective OT is having facility of laparoscopic surgeries.

- Emergency Duties of consultant are in three tier System

  Assistant and Associate professor are doing On Floor duties (Pool Roster)

  Professors are first on call (Pool roster)

  Senior professor are second on call (Unit wise on call)

- Duties of residents are divided in ward Duties and labour Room duties as per the roster.
- Responsibility of emergency surgeries are on Senior Resident and on floor consultant and if problem arises further consultants called as per the tier system.
- Elective Surgeries and care are being done under supervision of unit heads.
- UG teachings are evenly distributed Batch wise in faculty as per the roster.
- PG teaching done by PG teacher as per monthly Roster.

- Ward rounds daily morning and evening rounds of all units are divided among faculty.

OTHERS:

Labour room and MCH OT SOP'S are already made as per the LaQshya Programme.

Baby hand over SOP's are already made.

New HDU and new SLR construction and facilty instalment is already in process.

LaQshya Programme guidelines are being followed in LR and various Quality improvement projects are going on with timely Data recording and weekly assessments

Following projects are going on in LR

1. Safe hand hygiene Practice for 2 minutes by the Doctors who are cxonducting vaginal deliveries.
2. 10 units Oxytocin within 1 minut of vaginal delivery and long term impact on decrease on PPH rates.
3. Delayed cord clamping.
4. Immediate drying of new born.
5. Initiation of early breast feeding.

Labour room team of doctors and staff are being oriented every month for the above going on projects. Fire safety drill, spill management, Hand washing drill and safe hands pledge are being planned twice every month.

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DEPARTMENT OF ORTHOPEDICS

STANDARD OPERATING PROCEDURES (SOPs) AND SERVICES RENDERED BY DEPARTMENT OF ORTHOPAEDICS PT.B.D.SHARMA, PGIMS,ROHTAK

Following services are being provided here at PGIMS, Rohtak

(A) OUT-PATIENT DEPARTMENT (OPD):- OPD is being run on all working days of the week except Sundays & Gazetted holidays. A team of doctors treat a variety of patients including traumatic injuries, fractures, non-traumatic conditions like congenital deformities, arthritis and backache and musculo skeletal oncology and spinal disorder.

Unit-I	Unit-II	Unit-III	Unit-IV
Monday	Tuesday	Wednesday	Monday
Thursday	Friday	Saturday	Thursday

At OPD we have our Plaster Clinic where plasters are being applied for fractures, club foot or other soft tissue injuries by doctors assisted by plaster technicians.

At OPD, we also have our Minor OT where simple operative procedures like Joint Aspiration, minor implant removal procedures, I&D (Incision & Drainage), excision of soft tissue swellings, biopsy, debridement's are performed under sterile conditions by doctors.

(B) PARAPLEGIA:- This unit is meant for providing care to the patients of spine injuries with neurological deficits. Patients here are laid upon air mattresses to avoid bed sore formation while simultaneously, they are being rehabilitated by professional physiotherapists. Bed sore care, dressing, minor debridements are done by duty doctors. Round the clock nursing case is provided to all the patients. Selected patients are managed operatively like Pedicle Screw Fixation Laminectory, Antero-lateral Decompression surgeries while others are managed conservatively by crutch field traction. Special room is available with three beds for post operative cases of spine for prevention of infection and to maintain aseptic precautions

(C) ARTHROPLASTY ROOM :- This is a specialize room near paraplegia unit consisting of four beds which are used for keeping post operative Arthroplasty cases. Patients are given nursing care round the clock along with specific physiotherapy and Gait training for quicker rehabilitation. This room is maintained with all aseptic precautions to prevent infection.

(D) PHYSIOTHERAPY:- This centre is dedicated to provide all the rehabilitative care to the OPD patients and the IPD patients. A variety of services like SWD (Short-wave Diathermy), ILT (Intermittent Lumbar Traction), ICT (Intermittent Cervical Traction), Ultrasonic Massage, Wax Bath, Spinal Stretch exercise, shoulder-wheel exercise, gait training etc. to spine injury and arthroplasty patients along with Accupational therapy are provided here.

(E) BONE DENSITOMETERY CENTRE (DEXA SCAN):- This centre is meant for screening the patients of osteoporosis or those who are likely to develop it by having a DEXA SCAN (Dual Energy X-ray Absorptiometry).

(F) ORTHOPADIC WORKSHOP :- At workshop, we provide the splints, braces, modified shoes, other orthotics and prosthesis for the patient being sent from OPD as well as ward. This workshop is playing an important role in deformity correction of the patients along with their rehabilitation.

(G) IN-PATIENT DEPARTMENT (IPD/WARD):- It is home to the admitted patient from OPD as well department of A&E and Trauma Centre. Patients here are looked after round-the –clock by duty doctors

and nursing staff. Daily morning and evening rounds are taken by consultant of respective units. The ward is accompanied with a Minor OT where simple operative procedures like I & D (Ineision & Drainage), debridements can be done under sterile conditions by duty doctors. Lab Technician posted in ward is doing basic lab investigation for admitted patients.

(H) OPERATION THEATRE:- The OT complex is well equipped with state-of-the-art machines and technology. Patient of all kind like trauma, degenerative disorders (arthritis), infections, cancer (tumour), limb reconstruction and congenital disorders are being operated upon by expert surgeons under all aseptic conditions to reproduce best outcomes.

(I) **TEACHING OF POST GRAUDATE & UNDERGRADUATES:-** Teaching of PGs and UGs is being done in OPD and ward, one class room in OPD and Two class room in department and one class room in ward are well equipped for teaching of students, PG teaching lab/ research lab is well equipped to provide and promote research activates by students.

Journal Club, case presentations, seminars and group discussions are regulary held in the department as a part of comprehensive teaching of students.

(J) **SPECIALTY CLINICS:-** Various specialty clinics as Arthroplasty clinic Dr. R.K. Gupta on Tuesday, Arthroplasty clinic by Dr. R.C. Siwach on Wednesday, Spine Clinic by Dr. Roop Singh on Monday, Arthroscopic Clinic by Dr. Ashish Devgan on Friday.

Sr. No.	Name of Faculty	OPD Days
1	Dr. R.K. Gupta	Monday, thrusday
2	Dr. R.C. Siwach	Tuesday, Friday
3	Dr. Roop Singh	Wednesday, Saturday
4	Dr. Ashish Devgan	Monday, thrusday
5	Dr. Pradeep Kamboj	Tuesday, Friday
6	Dr. Raj Singh	Monday, thrusday
7	Dr. Vinit Verma	Wednesday, Saturday
8	Dr. Umesh Yadav	Monday, thrusday
9	Dr. Krishna PM	Monday, thrusday
10	Dr. Hemant More	Wednesday, Saturday
11	Dr. Jitendra Wadhwani	Tuesday, Friday
12	Dr. Virender	Tuesday, Friday
13	Dr. Sumit Kumar	Monday, thrusday
14	Dr. Sahil Arora	Monday, thrusday
15	Dr. Ajay Sheoran	Monday, thrusday

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DEPARTMENT OF PATHOLOGY

A. Distribution of Department into Units : None
B. Details of Faculty-
   1. Dr. Rajeev Sen, Sr. Prof. & Head
   2. Dr. Sunita Singh, Sr. Professor
   3. Dr. Nisha Marwah, Professor
   4. Dr. Rajnish Kalra, Professor
   5. Dr. Sanjay Kumar, Professor
   6. Dr. Veena Gupta, Professor
   7. Dr. Meenu Gill, Professor
   8. Dr. Sant Prakash, Professor
   9. Dr. Sumiti Gupta, Professor
   10. Dr. Sonia Chhabra, Professor
   11. Dr. Gajender Singh, Professor
   12. Dr. Monika Gupta, Assoc. Professor
   13. Dr. Promil Jain, Assoc. Professor
   14. Dr. Renuka Verma, Asstt. Professor
   15. Dr. Richa, Asstt. Professor
   16. Dr. Deepshikha Rana, Professor

C. Detail of OPD/OT/Ward Days : Laboratory services in all working days.
D. Services provided by the department including special clinics and SOPs followed in OPD consultation, admission, treatment and discharge of patients run by the department with days-

DEPARTMENT OF PATHOLOGY

INDEX

INTRODUCTION

Department of Pathology was established in 1962 in Govt. Medical College, Rohtak as small lab in the hospital building. Ever since it has grown leaps and bounds with many subspecialties.

Presently the department has various division in the following areas.

- Histopathology and Cytology in the college building (Behind director office) on 2nd floor.
- Special Haematology, Clinical Pathology and Emergency lab in D-2 block of the hospital.
- Hematology and Clinical Pathology lab for outdoor patients on 3rd floor in Ch. Ranbir Singh OPD block.
- Frozen Section in the OT complex on 2nd floor of the hospital.

Various teaching courses includes:

- Undergraduate MBBS, BDS and Post graduate MD Pathology,
- B.Sc. Nursing,
- Various paramedic courses like B.Sc. MLT, OT technician, BPT, B.Sc. Perfusion technology, B.Sc. Optometry.

Services provided:

- Histopathology
- Cytopathology
- Hematology
- Clinical Pathology
- Frozen section
- Medicolegal autopsy and Pathological analysis.

Teaching Staff:

- Faculty 16
- Senior resident 11
- PG Resident each year 13

The senior most faculty member is the administrative head of the department.

The department has a rotation policy by which all the faculty members are rotated in all subspecialties of Pathology for a period of one year for senior faculty members and two years for junior faculty members.

All Post graduates are also rotated in all subspecialties.

- 1st year PG – One month orientation in each subspecialty followed by three months posting in each i.e. Histopathology, Cytopathology and Hematology.
- 2nd year PG- Four month rotation in each subspecialty.
- 3rd year PG - Four month rotation in each subspecialty.
- Post graduates also work in medicolegal autopsy, frozen section and Blood Transfusion Medicine for one month by rotation.
- 15 days rotation in department of Biochemistry, Microbiology is also done in 2nd year PG course.
- Senior resident / Demonstrator – One year rotation in each subspecialty and one month posting for medicolegal autopsy and frozen section by rotation.

- Apart from clinical work all Post graduates and Senior residents are involved in teaching of undergraduates (MBBS, BDS) and paramedical courses.

UNDERGRADUATE TEACHING SCHEDULE

	Theory lecture/week	Practical + tutorial
MBBS	3-4	2-4 times/week
BDS	2	2
Paramedical Courses	2	2
BSc Nursing	2	-

POST GRADUATE TEACHING SCHEDULE

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9-10 AM	Theory class with UG students	Seminar	Theory class with UG students	Hematology Discussion	Theory class with UG students	Slide Seminar
10-1 PM	-Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation	Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation	Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation	Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation	Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation	Cytology/ Histopathology /hematology reporting with discussion -Grossing & dissection -FNAC Frozen section examination as per rotation
2-4 PM	- Demonstration / Practical class of MBBS	- Demonstration / Practical class of MBBS	- Demonstration / Practical class of MBBS students	- Demonstration / Practical class of MBBS	-Interesting case discussion pertaining to Cytology/ Histopathol	-Interesting case discussion pertaining to Cytology/ Histopatholo

	students -Interesting case discussion	students -Interesting case discussion	-Interesting case discussion	students -Interesting case discussion	ogy /hematology	gy /hematology
4-5 PM	Cytology/ Histopathology /hematology techniques and clinical case discussion	Cytology/ Histopathology /hematology techniques and clinical case discussion	Cytology/ Histopatholo gy /hematology techniques and clinical case discussion	Cytology/ Histopathology /hematolog y techniques and clinical case discussion	Cytology/ Histopathology /hematology techniques and clinical case discussion	Cytology/ Histopatholo gy /hematology techniques and clinical case discussion

Note: Pending/ Additional work if any should be completed even after the schedule time mentioned

SECTION I: HISTOPATHOLOGY

1. Receiving of specimens and grossing

Specimens are received in Room no. 344.

Various specimens received are: small biopsies, larger specimens, needle biopsies. All the biopsies are received in 10% formalin.

Formalin preparation- 90ml DW+10ml HCHO.

Registers: (maintained in room no. 344)

1. **Receiving register:** entry of specimens received is done along with the patient's name, CR no., and date of receiving, ward/OT/OPD from where specimen is being sent.
2. **Grossing Register:** includes Histopathology number, number of sections taken and whether the specimen is completely used up or not.

Grossing: done by post-graduates/ senior residents under the supervision of consultants.

2. Tissue processing and routine staining

Done in room no. 329 and 330 by histotechnicians.

Section cutting done using Rotary microtomes: 5 (3- Thermo, 1- Spencer, 1- Cipon)

Automatic tissue processors: 4 (2- Microm, 2- Citadel 2000)

H&E Staining done in room number 330. Stained sections are then screened by residents and reported by consultants posted in histopathology.

A. Fixation time: Smaller biopsy-One Day, Larger Biopsy and specimen-2-3 Days

B. Decalcification of bones: Trephine biopsy – 3-4 Days, Larger bones – 5-15 Days

C. Grossing- Two days

D. Processing of the specimen and staining – One Day

E. Reporting and further sectioning: 1-3 Days

F. Special Histochemical stains and IHC – 2-3 Days

Total Turn Around Time: Small biopsy- Seven days, Large specimen- 10-15 Days
Trephine biopsy- 10-15 Days, Large Bone Biopsy- 15-20 Days
All the stained slides and wax blocks are discarded as per the BiomedicalWaste Management and Handling, rules-2016.

Histopathology records are maintained in room no. 330 (maintained in room no. 330)

1) Histopathology register- includes Histopathology no., name of the patient, age, CR no.
2) Histopathology reports dispatch record- includes histopathology no., consultant's name reporting the case and the details whether the report has been despatched/ pending.
3) Slide or form Issue Register- includes the Histopathology number of the form and slide being issued along with the name of the resident getting the slides/form issued.

Storage of specimens & sections

Gross specimen: stored for 3 months in 10% formalin as per guidelines

Blocks and slides: 5 years

Records register: 10 years

3. Special Stains: done wherever required (in room number 308)

Following stains are done-

1) ZN staining
2) PAS
3) Reticulin
4) Masson's Trichrome
5) Gram's Stain
6) Congo Red
7) Mucicarmine
8) Von Giesson
9) Gomori's methenamine silver
10) Perl's stain
11) Verhoff's stain
12) Alcian blue
13) Giemsa
14) Sudan
15) PTAH
16) Toluidine blue

Records are maintained in separate registers

4. Immunohistochemistry:

Done wherever required. Wide panel of IHC markers is available.

Procedure of IHC staining:

1. 3-4 μm sections are mounted on slides coated with poly L-lysine.
2. Sections are deparaffinised in xylene and rehydrated through graded alcohols.
3. Slides are washed in running tap water.
4. Antigen retrieval using citrate or tris EDTA is done in pressure cooker.
   - One and a half litres of the buffer is boiled in the pressure cooker, without securing the lid.
   - Once boiling starts, the slide racks are placed carefully into the hot solution and the lid is sealed.
   - The pressure cooker is allowed to attain maximum pressure (15 psi), after which the slides are incubated for 2 minutes.
   - The pressure cooker is transferred to a sink and cold water is allowed to run over the lid until all of the pressure releases.
   - The pressure cooker is flooded with cold water and the slides are removed only after they have cooled.
5. Sections are rinsed in Phosphate -buffered saline (PBS) and excess PBS is drained off.
6. Endogenous peroxidase activity is blocked by using peroxidase block for 20 minutes.
7. Sections are washed with PBS for 5 minutes.
8. Incubated with protein block for 5 minutes.
9. Washed in PBS.
10. Optimally diluted primary antibody is applied for 60 minutes.
11. Washed in PBS.
12. Incubated with post primary block for 30 minutes.
13. Washed in PBS.
14. Incubated with polymer for 30 minutes.
15. Washed in PBS.
16. Incubated in Diaminobenzidine solution for 10 minutes.
17. Slides are rinsed in PBS and transferred to running water.
18. Counterstaining is done with hematoxylin.
19. Sections are then dehydrated in graded alcohols and xylene.
20. Clearing and mounting is done in distrene 80 dibutyl phthalate xylene (DPX).

LIST OF IHC MARKERS:

Sr. No.	Name of Marker	Sr. No.	Name of Marker
1	Estrogen receptor	40	Myogenin
2	Progesterone receptor	41	Muscle specific actin (SMA)
3	Her2neu	42	Factor VIII

4	CD 3	43	Desmin
5	CD 5	44	BCL-2
6	CD 10	45	Cytokeratin
7	CD 15	46	Myoglobin
8	CD 20	47	Hep. Core surface antigen (Hepatitis surface Ag)
9	CD 30	48	CD 23
10	CD 34	49	Mast cell tryptase
11	CD 45 (LCA)	50	Myeloperoxidase
12	CD 56	51	CD 138
13	CD 68	52	Calcitonin
14	CD 99	53	Chorionic gonadotropin
15	CD 117	54	CD 31
16	Cyclin –D1	55	Bcl 6
17	GFAP	56	Hepatocyte
18	Alpha Inhibin	57	MUM1 Protein
19	Ki-67	58	CD 246 (ALK)
20	PLAP	59	Epithelial Antigen Ber-Ep4
21	HMB -45	60	AMCAR
22	Chromogranin	61	Thyroglobin
23	NSE	62	CD 1a
24	Synaptophysin	63	CD 35
25	EMA	64	CKAE1/AE3
26	Vimentin	65	EGFR
27	Tdt	66	HMW CK AE-3
28	(HCG) beta	67	LMW CK AE-1
29	Calretinin	68	MELAN-A
30	CEA	69	MUC 4
31	S-100 Protein	70	CK 20

32	Alpha Fetoprotein	71	Glycophorin (CD 2359)
33	PSA	72	HMW 34 β
34	Kappa light chain	73	VEGF
35	Lambda light chain		
36.	P 63		
37.	P 53		
38.	TTF 1		
39.	CK 7		
	New Marker		
74	Caldesmon	88.	EPSTIN – Barr Virus
75	WT1 Protein	89.	Myeloid/Histocyte antigen
76	E-Cadherin	90.	HLA – DP, DQ, DR antigen
77	D2-40	91.	Sarcomeric actin
78	Helicobacter pylori	92.	Proliferating cell nuclear antigen
79	Amyloid A	93.	Leukemia, Hairy cell
80.	Neurophelament protein	94.	Mesothelial cell
81.	CD 79A	95.	Follicular Dendritic cell
82.	CD 8	96.	MUC-2
83	CD 43	97.	Albumin FITC
84.	CD 7	98.	C4c complement/FITC
85.	CD 4	99.	Kappa light chain FITC
86.	CD 19		
87.	CA 125		

AUTOPSY:

a) **Medicolegal Autopsies-**The viscera from different districts from different states of Haryana are submitted for pathological examination. The post-graduate students (one from each year), senior resident and one consultant are posted for reporting for one month duration by rotation.
b) **Pathological Autopsies-**These are done in forensic department by a team of consultant forensic medicine, pathologist and of concerned speciality. Viscera submitted to the department of Pathology is examined by the team posted for autopsy posting

Post-mortem specimens are received in the department at an average of 1800 per year.

A register is maintained in departmental office. (Room no. 318)

Specimens are received by post-graduates after verification of seal, forwarding letter, PMR and police papers by the residents.

Organs mentioned on forwarding letter and in the containers are verified and are received in 10% formalin

Grossing of the specimens is done by post-graduates and senior residents in room no. 344.

- A register is maintained for number of cassettes (for each organ and case) in room number 344. Specimens are preserved in 10% formalin for 5 years.

Tissue processing is done in room number 329 & 330.

Section cutting done using Rotary Microtomes and processed using automated tissue processors.

- H&E staining of the sections is done in room number 330 and various special stains are done in room number 308.
- Microsections (slides) and paraffin blocks are preserved for 10 years.
- The report record of medicolegal papers are preserved for 10 years.

Average turnover time: 45 days

FROZEN SECTION

Operation theatre Complex, Hospital Building

Equipment:

- Cryostat – HM525
- Trihead Microscope

Staff Deputed:

One faculty member, one senior resident, two Post graduates on rotation basis.

Tissue received:

- Tumor margins
- Tumor for primary diagnosis

Processing:

Imprint smears are prepared from tissue, toluidine blue staining is done.

Tissue from tumor/margins processed in cryostat, Rapid H&E staining done and examined.

Average turnover time: 15 to 20 minutes

GROSSING SOPs

MODIFIED RADICAL MASTECTOMY

TYPES OF MASTECTOMY:

1. **Radical Mastectomy:** Halsted type; It has been abandoned now. It consists of removal of all breast parenchyma, underlying and surrounding adipose tissue, the Pectoralis major and minor muscles, axillary contents in continuity and en bloc.
2. **Modified Radical Mastectomy:** Also known as Extended Simple Mastectomy and Total mastectomy. Removal of mammary tissue, axillary tail, nipple, surrounding skin and lymph nodes. Pectoralis is preserved.
3. **Simple Mastectomy:** All parenchyma, nipple and surrounding skin.
4. **Subcutaneous Mastectomy:** most of mammary tissue, without skin or nipple and without axillary tail.
5. **Quadrantectomy:** One of the quadrants is excised.
6. **Tylectomy:** also called lumpectomy. Excision of mass with surrounding breast tissue.
7. **Supraradical Mastectomy:** Radical Mastectomy with resected segment of chest, sternal ends of 2^{nd}, $3^{rd,}$ 4^{th} and 5^{th} ribs, segment of sternum, subpleural connective tissue and segment of pleura.

Grossing:

1. Orient the specimen: Use the axillary fat as a marker for lateral side and surgical section of muscle as upper side.
2. Separate the axillary tissue from breast tissue.
3. Examine any attached muscle, sample the area closest to tumor.
4. Examine the skin flap of specimen and mention:
    - Length, breadth
    - Scars
    - Recent surgical incisions
    - Edema
    - Discoloration
    - Peau d' orange
    - Puckering, bulging or retraction.
    - Ulcerations
    - Distance of tumor from nipple.
5. Excise the nipple areola region with thickness of at least 1 cm.
6. Palpate the specimen for dominant tumor mass and its relation to four quadrants.
7. Ink the base. Cut the entire breast longitudinally through and through into approximately 1cm thick slices. Examine each slice separately.
8. Mention the distance of tumor from nearest resected margin (base).
9. Tumor: Describe its dimension, its quadrant, distance from nipple, muscle or fascia, borders (circumscribed or infiltrating), necrosis, hemorrhage, calcification.
10. Rest of the parenchyma: document the relative amount of fat and parenchyma, presence of satellite nodules, cysts, whitish streaks etc.
11. Dissect out all lymph nodes that are seen or felt. A minimum of 15-20 lymph nodes should be found.

Sections:

A - Tumor

B - One section from each quadrant of breast parenchyma.

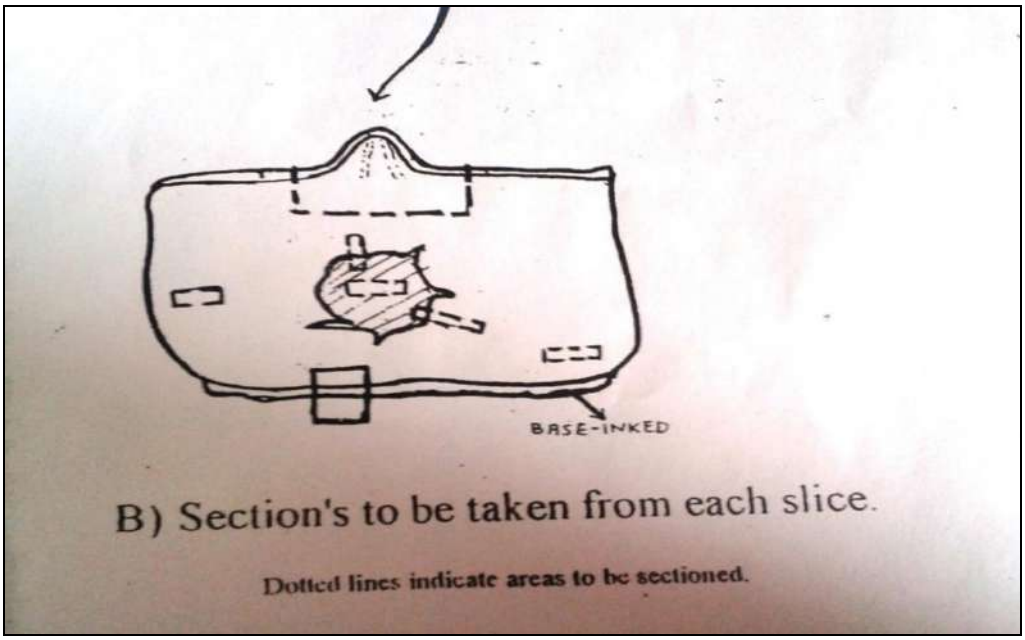
C – Margins: Posterior resected margin, lateral margin and cutaneous margin.

D – Nipple and areola.

E – Axillary lymph nodes:

- If size <5mm, submit entirely.

- If >5mm, bisect and submit half the node.
- Try to submit a narrow rim of tissue around each node so that comment on extranodal extension can be made.



Reporting:

Gross description:

1. Type of specimen.
2. Size of specimen.
3. Tumor description: size, circumscribed/infiltrative, location in quadrant, distance from base and skin, texture.
4. Any prior biopsy scar.
5. Skin, nipple and areola complex.
6. Lymph nodes isolated.

Microscopic description:

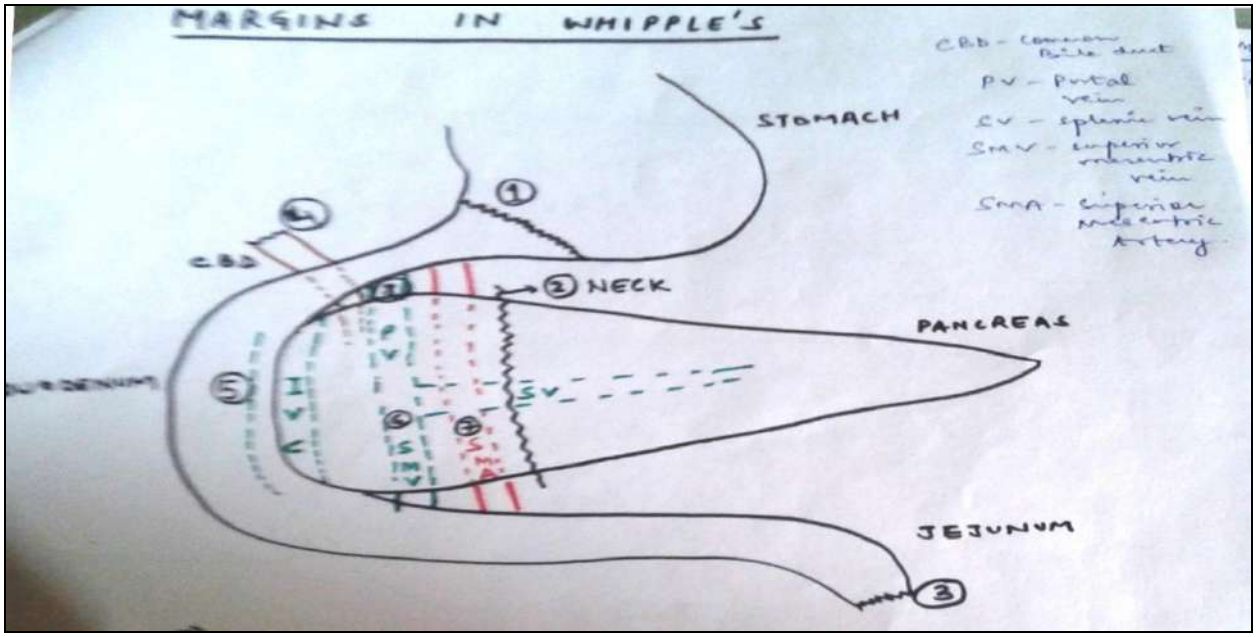
1. Histologic type
2. Histologic grade: MBR grading.
3. Margins of resection.
4. Lymph node status.
5. Angiolymphatic invasion.
6. Perineural invasion.
7. Any in situ component in surrounding parenchyma.
8. Microcalcifications (as seen on mammography).
9. Other changes like atypical hyperplasia, papillomas, Paget's disease, biopsy site changes).
10. Lymph node status.
11. Nottingham prognostic index.
12. IHC: ER, PR, HER2/neu.
13. Ancillary tests advised like FISH etc.

WHIPPLE'S PROCEDURE

It includes partial pancreatectomy with partial gastrectomy and duodenectomy, with or without cholecystectomy.

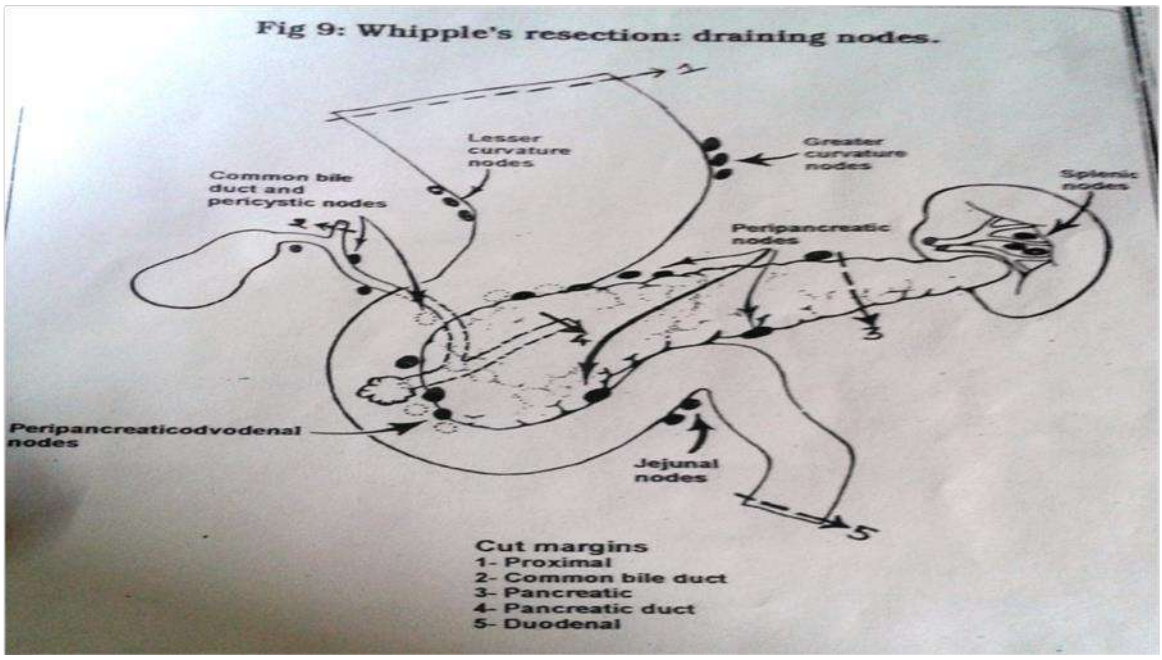
Grossing:

1. Open stomach along greater curvature and the duodenum along border opposite to Ampulla of Vater (AV). Look for evidence of gastric mucosal hypertrophy, associated tumors and abberant pancreas, mainly in antral and pyloric regions.
2. Probe the proximal end of CBD and pancreatic duct.
3. Cut whole pancreas horizontally following long axis of duct.
4. Describe relation of tumor to these structures.
5. Describe grossly if there is only one tumor nodule or multiple separate nodules.
6. Check pancreas for tumor invasion, atrophy, fibrosis, ductal dilatation.
7. Take margins of tumor.
8. Superior mesentric artery margins are most important.
9. If there is involvement of portal vein, then a section from portal vein margin may be taken.
10. Take four pieces from tumor.
11. Mention size of tumor. Size > 3cm is indication for chemotherapy.
12. Mention distance of tumor from portal vein, superior mesentric vein both grossly and on microscopy. Distance >1mm is good prognosis.
13. Check for lymph nodes.

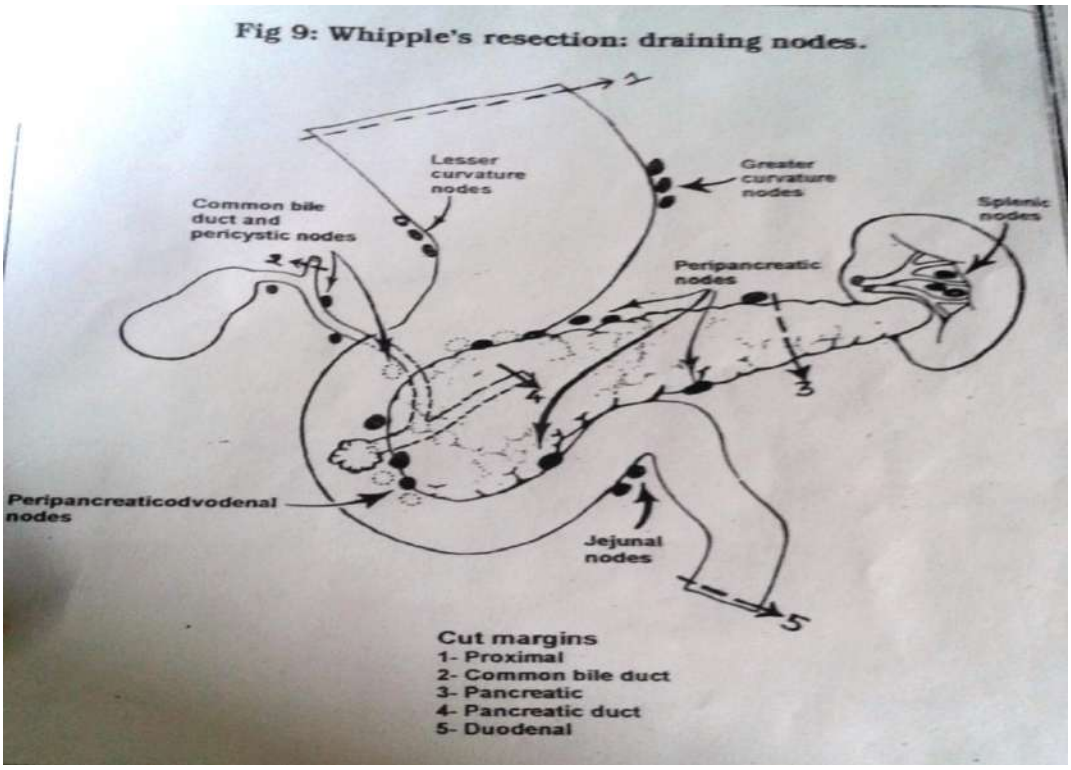


Sections:

1. Tumor, tumor full thickness, tumor with duodenum and CBD.
2. Stomach cut end (Pyloric cut end).
3. Pancreas cut end (Lateral Margin).
4. Jejunal cut end.
5. CBD cut end.
6. Posterior margin.
7. Retroperitoneal margin – SMV.
8. SMA margin.



9. Portal Vein margin.
10. Lymph nodes.
11. Peripancreatic fat.
12. Gall bladder



REPORTING

Gross description:

1. Size of pancreas, CBD, Stomach, Duodenal cut end, jejunal cut end.
2. Size of tumor.
3. Distance of tumor from nearest pancreatic margin, from stomach margin, from duodenal margin, CBD margin.

4. Approximate involvement of the thickness of intestine and pancreas.

Microscopic description:

1. Histologic type.
2. Grade.
3. Microscopic tumor extension.
4. Lymphovascular invasion.
5. Perineural invasion.
6. Peripancreatic fat invasion.
7. All resected margins.
8. Lymph nodes.
9. Pathological TNM staging.
10. IHC.

GROSSING OF THYROID

Types of thyroid excision:

- **Lobectomy** – Removal of a lobe (often combined for cosmetic reasons with removal of isthmus)
- **Subtotal thyroidectomy** – Removal of most of the thyroid leaving only posterior capsule and small portion of thyroid tissue (1-2 gm) on the side opposite to the lesion
- **Total thyroidectomy** – Entire gland including posterior capsule is removed

Processing the specimen:

Weigh and record the **dimensions** of the right and left lobes and isthmus.

Orient the gland

-Posterior surface is concave or flat,
-Lobes taper superiorly
- Isthmus is inferior.

-The **posterior surface should be examined carefully for parathyroid glands** (brown or yellow/brown ovoid bodies, 2 to 3 mm in size). Save in a separate cassette if found. **Ink** the entire outer surface.

-Serially section through the entire gland from superior to inferior.

Lesion if large – Bisect the specimen and make serial cuts each 5 mm thick,

If small – Bread loaf the entire specimen,

If solitary well encapsulated or circumscribed nodule slice perpendicularly to include the capsule.

Describe each lesion including

- Size,
- Color,
- Consistency (papillary, rubbery, firm, gelatinous, or friable),
- Cysts,
- Necrosis or hemorrhage,
- Location (upper, lower, right, left),
- Encapsulation or infiltration,
- Relationship to capsule (intact or with invasion of capsule).

Normal: beefy red/brown

Pale: lymphocytic thyroiditis or Hashimoto thyroiditis
Amber colored with a plastic-like consistency: amiodarone thyroid disease
Black: side effect of minocycline therapy

-Whenever possible, nodules **that have been previously sampled by FNA should** be identified and specifically designated in the cassette code

-Any lymph nodes dissected along with the gland

Sections:

-Diffuse and **inflammatorylesions** – 3 sectionsfrom each lobe and one from isthmus.

-Multinodular Goiter –1 section of each nodule (upto 5 nodules) including rim & adjacent normal gland; more than one section for larger nodules

-Solitary nodule or **adenoma** (upto 5 cm): Entire circumference, one additional section for each additional cm in diameter (include thyroid capsule along with adjacent normal thyroid to look for capsular invasion)

-Papillary carcinoma (diagnosed preoperatively on FNAC or in Frozen): Ink and block the entire thyroid gland and the line of resection

Microscopic sections:

-Follicular lesions: submit the entire tumor capsule

-Papillary carcinoma: At least one section per 1 cm including relationship to any perithyroidal tissue.

-Thyroid (nonlesional): Two representative uninvolved sections from each lobe. Submit all areas that show discoloration or increased consistency.

-Lymph node/parathyroid: Submit representative sections of all lymph nodes and entirely submit parathyroid.

Pathologic diagnostic/prognostic features sign-out checklist for thyroid tumors:

-Specimen: Thyroid (right lobe, left lobe, isthmus), lymph nodes

-Specimen Integrity: Intact, fragmented

-Specimen Size: Give size of each lobe and isthmus in three dimensions and size of any lymph node present.

-Specimen Weight

-Tumor Focality: Unifocal, multifocal (ipsilateral, bilateral, midline).

If more than one carcinoma is present, the characteristics of each carcinoma should be reported.

-Tumor Laterality: Right or left lobe (superior/central/inferior pole), isthmus

-Tumor Size: Largest nodule: greatest dimension (additional dimensions optional), If there are multiple nodules, give the range in sizes.

-Histologic Type: The WHO classification is recommended.

-Histologic Grade

-Margins: Uninvolved (distance of carcinoma from nearest margin optional), involved (site of involvement)

-Tumor Capsule: Totally encapsulated, partially encapsulated, capsule not present

-Tumor Capsular Invasion: most important for follicular and Hürthle cell carcinomas

-Interpretation of Capsular Invasion

-Lymph-Vascular Invasion: Not identified, present (focal <4 vessels; extensive ≥4 vessels)

-Perineural Invasion: Not identified, present

-Extrathyroidal Extension: Not identified, present (minimal, extensive)

- Extent of Invasion

-Regional Lymph Nodes: Number of nodes examined, number with metastases, size of largest metastasis

-Extranodal invasion: present or not identified

-Additional Pathologic Findings: Thyroiditis, diffuse hyperplasia, nodular hyperplasia, adenoma, C-cell hyperplasia

-Parathyroid Glands: Number, location, size, cellularity

-Distant Metastasis

-AJCC Classification

Description:

-Type of specimen

-External surface – nodular, bosselated.
-Look for color, margins, consistency
-Capsule – Intact or broken through, any structure attached to it
-Cut surface – Smooth or nodular
If nodular – number, size and appearance of nodules
Cystic, Necrotic, Calcified, Hemorrhagic
If encapsulated or infiltrative
Note distance from line of resection

PNEUMONECTOMY SPECIMEN

- Almost always performed **to resect Lung tumors**
- **Recipient pneumonectomy** prior to lung transplant
- **Extrapleural pneumonectomy**: to resect mesotheliomas.

Lung Tumors:

Processing the specimen:

-**Weigh** the specimen
-Record the **dimensions of the bronchial margin** (length and circumference)
-Identify the lung (right or left) or **lobe**(s) (upper, lower, or middle) resected
-Carefully examine the **pleural surface** for any evidence of disease

- Smooth and glistening : normal
- Dull and irregular: tumor implants or adhesions
- Retraction: invasion by tumor
- Delicate white reticular pattern on pleural surface: lymphatic spread of tumor

-Orientation of the specimen

Right Lung:

- Pulmonary artery is situated anterior to the airway
- The right side has three lobes

Left Lung:

-Pulmonary artery is situated superior to the airway
-The left side has two and a prominent lingular segment.

- **Inject with formalin** through the main bronchus, tie off or clamp the bronchus, fix overnight

If the bronchial resection margin has not already been removed as an OR consultation, do so before inflating. Cut an en face section and place in a labeled cassette.

The overall dimensions are measured after inflation.

Previously uncut specimens are **cut with a long knife in a parasagittal plane** (lateral to medial). However, other methods of sectioning may be appropriate

- Many proximal lung tumors arise from the airways, and so we find it most helpful **to start the dissection with the airways.**
- Begin by **removing the bronchial and vascular margins** as shave sections. Next, expose the bronchial mucosa by opening the large airways out to the subsegmental branches with small scissors.
- Carefully **examine the mucosa of the airways**, because subtle changes in the appearance of the mucosa may indicate a premalignant lesion.
- Similarly, open the large pulmonary vessels and evaluate them for invasion by tumor.
- **Section the lung parenchyma in the plane that best reveals the pathologic process and its relationship to the surrounding structures of the lung.**
- **For proximal lung tumors**, this relationship can best be demonstrated by sectioning the lung along the plane of the involved airways. The remaining lung parenchyma can then be sectioned at 1-cm intervals.

- **For peripherally located tumors**: serial sections through the tumor perpendicular to the closest segmental bronchus may best reveal the relationships of the tumor to the pleura, to the surrounding lung parenchyma, and to the small airways

Describe lesions:

- Size
- Color
- Consistency
- Location
- Relationship to major bronchi
- Vascular invasion
- Relationship to (invading through, retracting) or distance from pleura
- Distance from bronchial resection margin
- Presence of post-obstructive pneumonia.
- Describe **remainder of lung parenchyma**
    - Emphysematous changes
    - Fibrosis,
    - Consolidation,
    - Bullae
- Any abnormalities of the bronchi (bronchiectasis, mucous plugging).
- Remove the soft tissue around the **hilum** and look for **lymph nodes.**
    - Number
    - Range in size
    - Color
    - Consistency (anthracotic and firm or white and hard).
- Incidental ribs removed during thoracotomies can be processed

ALTERNATIVE METHODS for sectioning lungs to best demonstrate the pathologic lesions present:

- **Coronal sections (anterior to posterior):** These sections are better for demonstrating hilar lesions, as the bronchi and major vessels are seen in longitudinal section.

- **Superior to inferior (CT plane):** These sections are useful for showing the relationship of mediastinal lesions to the adjacent lung and for correlation with CT images. However, surgical specimens rarely involve such extensive resections.

Dissection of blood vessels: This type of dissection is useful for demonstrating vascular lesions (usually pulmonary emboli). Such lesions would be unusual in surgical specimens. The lung is approached from the lateral aspect within the fissure(s). A pair of scissors is used to cut towards the hilum until the pulmonary artery is entered. The major vessels can then be opened with the scissors. The vessels will not cross airways in this type of dissection.

Microscopic sections:

- **Tumor:** Up to five cassettes including relationship to uninvolved lung, pleura, and adjacent vessels and bronchi.
- **Margins:**
    - Bronchial resection margin.
    - Chest wall margins if attached chest wall is present
    - Pulmonary staple margin if the specimen is a lobectomy.
- **Lymph nodes:** All hilar lymph nodes.
- **Pleura:** Pleura closest to tumor if not previously submitted.
- **Uninvolved lung:** One representative section of each lobe

- **Rib:** If unattached to lung, a marrow squeeze may be performed. If attached to the lung, submit both margins and a section showing deepest point of invasion of tumor in relation to the bone.

Pathologic prognostic/diagnostic features sign-out checklist for lung tumors

-Specimen: Lung, lobe of lung, bronchus
-Specimen Integrity
-Specimen Laterality
-Tumor Site: Upper lobe, middle lobe, lower lobe
-Tumor Size: Greatest dimension
-**Tumor Focality**
-Histologic Type: The WHO classification is recommended
-**Histologic Grade**
-**Visceral Pleura Invasion**
-Tumor Extension
-Pleura
Chest wall, diaphragm, mediastinal pleura, phrenic nerve, parietal pericardium, heart, great vessels, esophagus, trachea, vertebral body.
-**Margins**
-**Treatment Effect**
-Tumor Associated Atelectasis or Obstructive Pneumonitis
-Lymph-Vascular Invasion
-Regional Lymph Nodes
-Location of lymph nodes
-Extranodal extension
-Additional Pathologic Findings
-Ancillary Studies: Epidermal growth factor receptor (**EGFR) analysis**, KRAS mutational analysis
-Distant Metastasis
-AJCC Classification

TRANSPLANT PNEUMONECTOMIES

-Weigh and **measure** the lung.
-Examine the Sterile tissue is **submitted for cultures** (bacterial, fungal, and viral) from an unused donor lung if the contralateral lung has been transplanted.
-Inflate the lung with formalin, either through the bronchus or by using a syringe, and fix overnight.
-Cut the lung into **sagittal sections**.
-Examine the parenchyma carefully looking for any focal lesions or evidence of infection, ischemia (variations in color or texture), or trauma.
-Submit from six to ten cassettes including central and peripheral lung parenchyma, bronchial resection margin, smaller airways, pulmonary vessels (both large and small), hilar lymph nodes, and any focal lesions.
-If infection is suspected, order **AFB, gram, and MSS stains** on a representative cassette.

EXTRAPLEURAL PNEUMONECTOMIES

Commando resection of **malignant mesothelioma**
The lung with attached hemidiaphragm is resected together with the surrounding parietal and mediastinal pleura and a portion of the pericardium.
Processing the specimen:
-Weigh the specimen
-Record the outer dimensions (total dimensions, dimensions of lung, dimensions of diaphragm, size of pericardium, bronchial margin).

-Identify areas of tumor involvement in the pleura. It may be helpful to save tissue for EM and cytogenetics. Adjacent tissue for permanent sections should be matched with this tissue.
-Inflate the lung through the bronchus and fix overnight.
-Examine and describe the outer surface of the pleura (i.e., the **parietal pleura**).
-Rents in the parietal pleura: Location and size.
-Percent involvement of pleura by tumor: Describe the range of size of the nodules (three dimensions), and the range in thickness of the unfused pleura
-Chest wall tissue: any areas of adherent muscle or soft tissue to the parietal pleura
-Pericardium: Involvement by tumor,
-Pleural plaques
-Talc reaction sites
-Mesothelioma: Usually less dense than plaque, firm (not as hard as plaque), gray/white, frequently nodular, and occasionally myxoid in appearance.
-Serially section the specimen at 1 cm intervals in the coronal (frontal) plane.
-Describe the **tumor involvement of the diaphragm** including distance from margins (anterior, posterior, medial, and lateral), depth of invasion into the diaphragm (noting any invasion of skeletal muscle), involvement of the peritoneal surface of the diaphragm (this is rare).
-Describe visceral pleural involvement including the percentage of visceral pleura fused to parietal pleura, the range in thickness of fused and unfused pleura, the percentage of unfused visceral pleura involved by tumor, the range of size of the nodules (unfused visceral pleura in three dimensions), and the site and size of any loculated effusions.
-Describe the **lung parenchyma including any tumor involvement**. tumor often invades into and thickens interlobar fissures (note site and extent)
-Describe (number and size) any **hilar lymph nodes**
-Selectively ink (before taking sections) areas of the resection **margins that** demonstrate the closest extension of tumor involvement to the pleural surface and diaphragmatic margins. Take sections (perpendicular to the pleura, two to three per cassette if the pleura is less than 0.5 cm thick) from the apex of the lung, from the anterior, posterior, medial, and lateral pleura at one level and perpendicular sections from the anterior, lateral, medial, posterior, and deep (= inferior) margins of the diaphragm
-A small **segment of rib is usually resected**. Describe dimensions, color of bone, color of marrow cavity. A marrow squeeze can be submitted unless gross lesions are identified or the bone is attached to the chest wall. In the latter cases, the bone should be radiographed and all sections suspicious for bony involvement submitted. If a portion of chest wall is received attached to the specimen, the margins of the chest wall are submitted

Microscopic sections:

-Tumor and pleural margins: Take sections of resection margins (after selective inking) with underlying tumor and superficial lung parenchyma perpendicular to the pleural surface.
In the usual case with extensive fusion of parietal and visceral pleura, nine to ten cassettes including margins of parietal pleura chosen to demonstrate the closest approach of the tumor to the resection margin (apex, and anterior, lateral, posterior, and medial pleura), and tumor and diaphragm, tumor and lung (demonstrating any invasion into lung), small and large nodules, any areas of variable appearance.

In the unusual case with limited or no areas of fusion of parietal and visceral pleura, take sections as above and also sample the unfused visceral pleura (apex, anterior, lateral, posterior, medial, and diaphragmatic) to reflect areas of minimal (gray macules, nodules, or polyps) and maximal involvement (solitary or coalesced nodules).

-Pericardium: One to two sections to demonstrate tumor penetration, closest margin.
-Diaphragmatic margins: Sections from anterior, lateral, posterior, and medial margins. Take sections to demonstrate the site of deepest penetration of tumor into the diaphragmatic muscle.

-Lung: Two generous sections (in separate cassettes) of representative lung from periphery of both upper and lower lobes (these may be essential in determining exposure to asbestos) and any focal lesions.

-**Bronchial resection margin:** One section, en face. This will usually have been taken as a frozen section.

-**Hilar lymph nodes:** Submit each lymph node.

-**Separate rib:** A bone marrow squeeze may be performed if the rib is not attached to the specimen and is grossly normal. If the bone is attached or grossly abnormal the bone must be decalcified and cross sections submitted.

Pathologic diagnostic/prognostic sign-out checklist for mesotheliomas

-Specimen
-Procedure
-Specimen Integrity
-Specimen Laterality
-Tumor Site: Parietal pleura, visceral pleura, diaphragm, pericardium
-Tumor Size: greatest dimension
-Tumor Focality: Localized, diffuse
-Histologic Type
-Tumor Extension
-Margins
-Treatment Effect
-Involvement of anatomic structures: % of parietal and of visceral pleura involved by tumor
-Thickening of pleura by tumor (range/minimum and maximum)
-Involvement of diaphragmatic muscle/pericardium/rib involvement of adipose tissue / endothoracic fascia/skeletal muscle of chest wall
-Lung parenchyma or tissues in the contralateral chest
-Pleura
-Additional pathological findings
-Regional lymph nodes: involvement, number, location, extracapsular invasion if present
-Distant Metastasis
-AJCC Classification

HISTOPATHOLOGY STAINS

HEMATOXYLIN AND EOSIN STAIN

Method:

Remove the paraffin wax from the section, by placing the slide rack in an oven at 56-60^{o}c for 15 minutes to upto 1hr and then immediately immersing the slides with melted wax in xylene for about 5 minutes.

Immerse in absolute alcohol, 2 changes, 1 minute each, so as to remove xylene which is miscible in alcohol.

Wash in water.

Dip the slides in cooling jar containing hematoxylin for 15 minutes.

Wash in water. For this purpose, put the slides in coplin jar which is placed under running water. The arrangement of running water should be such that water should be freely flowing and not showering

directly on the slide. This can be achieved by slow release of the tap, or inserting plastic tubes from the tap to the bottom of the jar.

Dip the slide in coplin jar containing acid alcohol (3% HCl in 70% alcohol).

This will differentiate the blue nuclei from the rest of the field.

Wash in water quickly (as described above).

Blue in ammonia/ running water/ saturated $LiCO_{3.}$

Rinse in water.

Stain in 1% aqueous eosin Y for 3 minutes or a few dips.

Wash in running water for a minute and clean the back and sides of slides now.

Dehydrate in 3 changes of absolute alcohol.

Clear in 2 changes of xylene to remove all alcohol.

Mount with a coverslip using DPX.

Results:

Nuclei – blue/ black

RNA rich cytoplasm, calcium – blue

Cytoplasm – varying shades of pink

Muscle fibers, keratin – deep pinky red

Collagen – pale pinky red

Red blood cells – orange/red

Fibrin – deep pink

Z N Staining for ACID FAST BACILLI

Fixation: normal saline/ others

Reagent:

Basic Fuschin – 1gm

Absolute ethyl alcohol – 10ml

Carbolic acid – 5 ml

Distilled water – 100ml

Dissolve basic fuschin in alcohol and then add phenol.

Method:

Bring sections to water i.e. hydrate the sections.

Place the slides face up on slide rack.

Heat carbol fuschin in a test tube.

Put heated carbol fuschin over the slide for 5-10 minutes.

Wash in running water to remove excess stain.

Decolourise with 20% H_2SO_4 for Tubercle bacilli x 2 minutes, till light yellowish.

Wash in running water x 5 minutes.

Counterstain lightly with1%methylene blue – 1 minute by putting it on slide.

Rinse in water.

Dehydrate, clear and mount.

Results:

Acid fast bacilli – Bright red

Nuclei – blue

Caseous material – very pale greyish blue

RBC's – slightly reddish tint (Good index against over decolourisation)

RETIC STAINING:

Method:

1. Keep paraffin sections in running water x 5 minutes.
2. Oxidise in 0.25% $KMnO_4$ in koplin jar for 5 minutes.
3. Wash in running tap water.
4. Completely bleach in 1% oxalic acid on side till colour of $KMnO_4$ is bleached - about 1-2 minutes
5. Wash well in running tap water for 10 minutes, then rinse in distilled water.
6. Sensitize in 2% iron alum for 15- 30 minutes.
7. Rinse well in distilled water.
8. Impregnate with silver solution for 30 secs - 1 minute, till it becomes transparent. Maximum upto two minutes should not cause overimpregnation.
9. Wash well in several changes of distilled water.
10. Reduce in 10% aqueous neutral formalin - about 3 minutes.
11. Wash well in distilled water.
12. Dehydrate
13. Clear
14. Mount

Optional

After step no 11, Tone in 0.2% gold chloride for 1-3 minutes.

Rinse in tap water.

Fix in 5% sodium thiosulphate for 5 min.

Wash well in tap water.

Counterstain if desired.

Rinse in 95% alcohol, dehydrate in 100% alcohol.

Dehydrate, clear and mount.

Results:

Reticulin fibres – black

Nerve fibre – black

Nuclei- almost colourless

Other tissues- according to counterstaining

VAN GIESON'S PICROFUSCHIN'S STAIN

Solution:

Saturated aqueous picric acid solution -50cc

1% aqueous acid fuschin solution -9cc

Distilled water -50cc

Method:

Dewax, clear and immerse the sections in water.

Either stain in Wiegert's hematoxylin or Celestine blue-hemalum sequence for 40 minutes/ iron hematoxylin.

Celestine blue solution:

- Celestine blue B – 2.5gms
- Ferric ammonium sulphate - 25gms
- Glycerin – 70cc
- D.W. – 500cc

Ferric ammonium sulphate is dissolved in the cold distilled water with stirring,

Celestine blue is added and the mixture is then boiled for few minutes.

After cooling the stain is filtered and Glycerin is added.

The final stain should be usable over 6 months.

Wash in tap water.

Give a few dips in 1% acid alcohol for differentiation or leave it for a minute in the same.

Wash well in tap water for bluing.

Counterstain in Van Geison's solution in koplin jar for 3-5 minutes.

Invert the slide on blotting paper.

Dehydrate through alcohols.

Clear in xylene and mount in DPX.

Results:

Nuclei – blue/black

Collagen – red

Other tissues, muscles, RBCs – yellow

MASSON'S TRICHROME STAIN

Solutions:

- Acid fuschin – 0.5gms
- Glacial acetic acid – 0.5cc
- D.W. – 100cc
- 1% Phosphomolybdic acid in distilled water
- Methyl blue – 2gms
- Glacial acetic acid – 2.5cc
- D.W. – 100cc

Methods:

Dewax sections and bring to water.

Remove mercury pigment by iodine thiosulphate sequence.

Wash in tap water.

Stain nuclei by Celestine blue-hemalum method.

Differentiate with 1% acid alcohol.

Wash well in tap water for bluing.

Stain in acid fuschin solution A for 5 minutes.

Rinse in D.W.

Treat with phosphomolybdic acid; solution B - 5 minutes.

Drain it, by keeping slides on its edges in rack.

Stain with methyl blue; solution C for 2 to 5 minutes (or light green).

Rinse in D.W.

Treat with 1% acetic acid - 2 minutes.

Dehydrate through alcohols.

Clear in xylene, mount in DPX.

Results:

Nuclei – blue/ black

Cytoplasm, muscles, RBC's - red

Collagen – blue/green

SECTION II: CYTOPATHOLOGY

(Room No. 308)

The Services provided in Cytopathology section are:

1. Fine Needle Aspiration Cytology/Biopsy (FNAC/FNAB)
2. Exfoliative Cytology
3. Body Fluids Examination
4. Immunocytochemistry

Fine Needle Aspiration Cytology:

The FNA Procedure is carried out in Ch. Ranbir Singh OPD, Room no 346. The patients are referred from various specialities with a requisition form with full clinical details.

- Superficial mass – done in OPD block.
- Deep visceral organ- USG or CT guided FNA done in radiology (after fixing time with radiologist)

Toluidine blue staining is done at the time of FNA to assess the adequacy of the specimen.

Smears prepared are fixed in alcohol for H&E and PAP smear.

Air dried smears are prepared for MGG stains.

Smears are then transferred to Cytopathology section, Room no. 308, where they are stained by cytotechnicians.

Stained smears are then screened by residents and reported by consultant posted in Cytopathology.

Average turnover time: 3 days

Special cytochemical stains like AFB, PAS etc and immunocytochemistry is done wherever required.

Exfoliative Cytology: Body fluids (Pleural/Peritoneal/Pericardial/Synovial Fluid/CSF Sputum/PAP Broncho Alveolar Lavage) are submitted to the Cytopathology section room no. 308.

Body fluids processed by:

1. Conventional technique
2. Cytocentrifuge
3. Liquid based cytology

Smear are prepared and stained with H&E and Leishman stain.

PAP smears – Prepared in Gynecology OPD and submitted to room no. 308. Both conventional preparation and liquid based cytology smears are prepared and stained by Papanicolaou stain.

Separate registers are maintained for FNA, Pap smears and body fluids.

Storage of samples

All the smears prepared are stored for 5 years.

The original reporting forms are hard bound and kept as record for 5 years.

A duplicate report record is also prepared by entering the patients' details and the report in a register.

All cases diagnosed as malignant are provided with a CCR (central cancer registry) no.

Turn Around Time: 4-6 Days

All the specimens and stained slides are pretreated by Autoclave before disposal as per the Biomedical Waste Management and Handling, rules-2016.

Cytology equipment:

- Centrifuge; Remi
- Cytotech Centrifuge; Sakura 4332
- Liquid Based Cytology; Biorad

STANDARD OPERATING PROCEDURES

CYTOPATHOLOGY

GIEMSA STAIN

Giemsa stain(stock solution)

- Powdered Giemsa dye 3.8 gm
- Methanol 250 ml (warmed)
- Add this mixture in 250 ml Glycerol

Or

Use commercially prepared Giemsa stain

Principle

Giemsa stain is the most complex type of Romanowsky stain. The remarkable property of the Romanowsky dyes of making subtle distinction in shades of staining, and of staining granules differentially, depends on two components:

Azure B (Trimethylthionine)

Eosin Y (Tetrabromofluoresence)

Procedure

1. Put Giemsa (1:9 dilution with distilled water) on the smear for 10-15 minutes
2. Wash with tap water

3. Air Dry and mount

Quality control

- When a new batch of stain is prepared the best staining time must be evaluated. Stain the film made from blood at different times and compare the results.
- Maintain consistency in the staining.
- Films should be fixed as soon as possible after they are made. If left unfixed at room temperature for several days, the dried smear may give a pale background with drying artifact.
- It is important to prevent any contact with water before fixation is complete.
- Methyl alcohol should be stored in a bottle with a tightly fitting stopper and protected from humid climates

HEMATOXYLIN AND EOSIN STAIN (H & E STAINING)

Primary samples:

10% formalin fixed paraffin embedded tissue, frozen tissue, FNAC, material obtained by FNA technique, all body fluids.

Required Reagents:

Composition of Ehrlich's Hematoxylin-

- Hematoxylin 2 gm
- Distilled water 100 ml

Bring distilled water to 55^0 C - 60^0 C and then add hematoxylin and rotate till dissolved

- Absolute alcohol-100 ml
- Glacial acetic acid -10 ml
- Potassium Alum - 50 gm
- Glycerine -100ml

Allow to stand overnight before use or add 0.4 gm sodium iodate. It is stable for 6-8 weeks.

Composition of working Eosin solution-

- 1% Eosin
- 95% Alcohol
- Acetic acid

Procedure

1. Fixation should be done by keeping the smears in alcohol.
2. Smears should then be washed in running tap water for 5 minutes
3. Then the smear should be kept in Hematoxylin solution for 10-15 minutes.
4. Slides should be washed in running tap water for 5-7 minutes for blueing.
5. Slides should then be kept in working eosin solution for 1-2 minutes.
6. Dehydration of smears should be done by giving one change in 90% alcohol and then two in 100% alcohol each for 2 minutes.

7. Then clearing of smears should be done by giving three changes of Xylene each of 2 minutes.

Note: 1) Hematoxylin should be changed weekly.
2) Eosin solution should be changed on the third day.

Result:

Nuclei – blue

Cytoplasm – pink

Quality control:

Excessive bluing should be prevented using 1% acid alcohol.

PAPANICOLAOU STAINING

Purpose:

For routine staining of cervical smears (Pap smears)

Principle:

Hematoxylin is the optimum nuclear stain and the combination of OG 6 and EA 50 give the subtle range of green, blue and pink hues to cell cytoplasm. The use of Pap's stain results in well stain nuclear chromatin, differential cytoplasmic counterstaining and cytoplasmic transparency.

Primary Sample:

Cervical smears (pap smears)

Required reagents:

1. Harris Hematoxylin

2. Orange G 6 (1% aqueous)

- Orange G (10% aqueous)
- Alcohol 100ml
- Distilled water 100ml
- Phosphotungstic acid 15 mg

3. EA 50 (Stock solution)

A. Eosin Y 0.5% (in 95% alcohol)
B. Bismark brown 0.20% (in 95% alcohol)
C. Light green 0.25% (in 95% alcohol)
D. Pkts of phosphotungstic acid
E. Saturated solution of Lithium carbonate in distilled water

Working EA 50 solution

- Stock A Eosin 0.5% 50 ml

- Stock B Bismark Brown 0.2% (in 95% alcohol) 25 ml
- Stock C Light green 0.25% (in 95% alcohol) 25 ml
- Stock D Phosphotungstic acid 200mg
- Stock E Saturated solution of Lithium Carbonate 1 drop

Filter the stain before use

Procedure:

1. Fix the smear in 70-80% Ethyl Alcohol for 5-10 minutes.

2. Hydrate in 95% alcohol for 2 minutes and 70% alcohol for 2 minutes.

3. Rinse in water x 1 minute

4. Stain in Harris hematoxylin for 4-5 minutes

5. Rinse in running water for 5 minutes

6. Dehydrate with 50%, 70%, 80%, 95% alcohol x 2 minutes each.

7. Stain in OG-6 for 3-5 minutes.

8. Blot the slide

9. Rinse in 2 jars of 95% alcohol for 2 minutes each.

10. Stain with EA-36 for 4-5 minutes.

11. Blot the smear.

12. Rinse in 95% alcohol for 1 minute.

13. Dehydrate and mount in DPX.

Interpretation:

Nuclei- Blue / Black

Cytoplasm- Non keratinising squamous cells – Blue / Green.

Keratinising squamous cells- Pink / orange

Quality control:

1. A separate bottle of fixative for each patient is preferable

2. 95% ethanol is the best fixative

3. Haemorrhagic smears should not be accepted as blood and excessive mucous obscures cellular morphology.

   In case of haemorrhagic pap smears and FNA aspirates – Put the smears in alcohol for 10-15 minutes followed by drying at 37^0 for 5 min in incubator. Rehydrate with normal saline for 30 sec and fix in methanol stain.

4. Ideal decolorizing agents (weak acid alcohol) should be used to remove excess stain from cytoplasm and nucleus.

5. Ph of the bluing solution should be >8 to make it alkaline and produce colour change.

ZIEHL NEELSEN METHOD FOR ACID FAST BACILLI

Reagents:

- Basic Fuschin – 1gm
- Absolute ethyl alcohol – 10ml
- Carbolic acid – 5 ml
- Distilled water – 100ml

Dissolve basic fuschin in alcohol and then add phenol.

Method:

1. Bring sections to water i.e. hydrate the sections.
2. Place the slides face up on slide rack.
3. Heat carbol fuschin in a test tube.
4. Put heated carbol fuschin over the slide for 5-10 minutes.
5. Wash in running water to remove excess stain.
6. Decolourise with 20% H_2SO_4 for Tubercle bacilli x 2 minutes, till light yellowish.
7. Wash in running water x 5 minutes.
8. Counterstain lightly with 1% methylene blue – 1 minute by putting it on slide.
9. Rinse in water.
10. Dehydrate, clear and mount.

Results:

- Acid fast bacilli – Bright red
- Nuclei – blue
- Caseous material – very pale greyish blue
- RBC's – slightly reddish tint (Good index against over decolourisation)

PREPARATION OF CYTOSPIN SMEARS

Purpose and scope

For proper preparation of smears with fluids of low cell contents

Responsibility

Technician on duty

Procedure

1. On receiving the fluid samples, the CR of the patient should be checked and a unique accession number should be allotted to the sample.
2. If the fluid is not prefixed, it should be fixed with equal volume of cytofixative.
3. Three to four slides are prepared by engraving the accession number on the slides.
4. If the fluid is grossly turbid, it should be centrifuged at 1500 rpm for 10 minutes.
5. The supernatant should be decanted and smears should be prepared from the sediment.

6. If the fluid is clear, smears should be prepared by cytospin method as follows:
   -First the fluid should be preconcentrated using normal centrifugation at 1500 rpm for 10 minutes.
   -Decant the supernatant and preserve the sediment.
7. Now the gelatinized slide bearing accession number with overlying filter paper with 6µm hole should be fixed in the cell container.
8. Install the concentrators in the centrifuge machine.
9. Concentrators with slides should be loaded with 200µl of sediment of fluid.
10. The cytospin should be done at 1000 rpm for 10 minutes.
11. The slide should be encircled by a marker in the area where cells are deposited.
12. Then smears are stained routinely.

LIQUID BASED CYTOLOGY

As an alternative to conventional cytology, liquid based cytology is a technique for transferring the cellular material collected with a brush from transformation zone of the uterine cervix. Unlike the conventional Pap test, the cells are not spread directly onto a slide but are transferred into vial containing a fixative liquid. This container is then sent to a specially equipped laboratory. Currently, two commercially available liquid based cytology systems, ThinPrep and SurePath are approved by the U.S. Food and Drug administration and are allowed to claim increased cytologic detection of squamous intraepithelial lesions and a reduction in the number of unsatisfactory pap tests compared with the conventional pap.

Steps to be followed in the lab after receiving brush head containing vials from Gynecology OPD:

1. Vortex the vials and load them with centrifuge tubes and syringes in the BD PrepMate rack.
2. Put 4 ml dispersing agent in each centrifuge tube and run the PrepMate system. Density gradient is formulated to fractionate cells from obscuring artifacts such as blood, mucus, inflammation and protein using size, weight and density. In essence the cells are concentrated. The cell pellet is considered enriched because it contains primarily epithelial cells.
3. Centrifuge for two minutes 15 sec @ 200G.
4. Aspirate 8 ml supernatant and again centrifuge for 10 min 15 sec@ 800G.
5. Decant tubes by rotating rack 180^0, blot tubes to remove excess fluid.
6. Vortex centrifuge tube racks for 15+/-5 sec.
7. Put tubes and slide racks in BD Prepstain slide processor.
8. Run BD Prepstain slide processor. A robotic arm in the PrepStain transfers the sample from the tubes to a settling chamber that sits atop the glass slides. Cells are allowed to settle on the slides by gravity.

Slides are prepared and stained by the system, then slides are put in xylene for few seconds and then mounted. Area of 13 mm radius is stained on slide. The shelf life of residual material is 4 weeks at room temperature and 6 months at 4^0C (refrigerated). Residual material can be used to process multiple representative slides or a cell block.

Advantages of LBC

- Almost 100% sample is processed and reviewed.
- Immediate liquid fixation prevents artifacts such as air drying.
- Cleaner background.
- Homogenised specimen.
- Significantly fewer unsatisfactory cases.
- Increased detection of high grade intraepithelial lesions.
- Ancillary testing like HPV testing and immunocytochemistry on residual material.

- Potential for processing residual for cell block.

Pitfalls

- There is considerable controversy surrounding the relative sensitivity and specificity of the procedure, largely due to a lack of well-designed comparative studies.
- SurePath has lower sensitivity than conventional one for ASCUS lesions.
- Training of both the cytotechnicians who perform the initial screening in the laboratory and the pathologists who provided the final interpretation is critical to obtaining optimal performance of a cervical cytology program.
- Proper collection of sample is also important. Gynecologists should be trained to sample correct brush and head of the brush should be left inside the vial.

PREPARATION OF CELL BLOCK

Purpose and scope:

Cell block technique is the paraffin embedding of all residual material remaining after completion of cytologic preparations as well as processing of tissue fragments present in cytologic techniques. Aspiration biopsy material, sputum, effusions, urine sediment and material from GIT are suitable for cell block processing as are all tissue fragments incidentally obtained during any other diagnostic cytologic procedure.

Procedure:

1. First the fluid with tissue fragment should be fixed with cytofixative

2. Then the fixed fluid should be centrifuged at 1,500 rpm for 10 minutes and allowed to stand for 2 hours.

3. If the sediment and tissue fragments are in sufficient quantity, the cell block be prepared by fixed sediment method and if the sediment is scanty, cell block should be prepared by bacterial agar method.

Fixed sediment method:

1. Supernatant should be decanted and sediment should be collected on a filter paper and folded

2. Then the filter paper with sediment should be put in formalin for fixation and processed routinely

Bacterial Agar Method:

1. Supernatant should be decanted and sediment should be collected in plastic tube containing.

2. Melted agar should be added to the plastic tube containing the sediment.

3. After the agar is solidified the plastic tube should be put in chloroform/xylene for 3 to 4 hours.

4. After the plastic tube is dissolved in xylene/chloroform, the lower portion of the agar with sediment should be cut and then put in formalin and processed routinely.

Plasma thromboplastin method

1. Centrifuge the fluid and discard supernatant (no need to centrifuge if remaining sediment is available after preparing slides)
2. Add 2 drops of plasma (outdated plasma from blood bank) to the sediment.

3. Mix well
4. Add 4 drops of thromboplastin (adding 10 ml of distilled water to 5000 units of powdered thrombin)
5. Mix again and keep for 5 minutes.
6. Slide off resultant clot into the filter paper pre-moistened with formalin.
7. Wrap this clot in tissue cassette.
8. Fix it in formalin tainted with eosin for 4 hours
9. Process as routine histological tissue.

Pick up method

If frank tissue fragments present, fix it in formalin and process as for small biopsies.

SECTION III

CLINICAL PATHOLOGY & HEMATOLOGY SECTION

Clinical pathology includes the following sections:

1. **Special Hematology:**
   D2 block, room no. 6 deals with samples from various wards and special Hematology tests
2. **Emergency laboratory**:
   D2 block, room no. 8 deals with samples from emergency department
3. **Outpatient Department :**
   OPD block, room no. 346 deals with samples from various OPDs
4. **Trauma Laboratory**: Dhanwantri Trauma Complex,Second Floor, Room no. 202

Special Pathology Laboratory (D-2 Block, Room No – 6)

A) Sample receiving

From various wards on all working days from 9:00 AM- 3:00 PM

- Ground floor:
  - Orthopaedics ward
  - Gynae ward
  - Medicine ward
  - Paeds ward
- First floor:
  - Peads ward
  - Surgery ward
- Second floor: Medicine ward
  - Opthal ward
  - ENT ward
  - Skin ward

- Super specialities department-
    - Cardiology
    - Nephrology
    - Rheumatology
    - Neurology
    - Clinical haematology
    - Pulmonary medicine
    - Endocrinology
    - Gastroenterology
- Radiotherapy department

B) <u>Type of samples and collection</u>

1) Blood
2) Urine
3) Fluids

- Blood for-
    - Complete hemogram: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - ESR estimation: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - Retic count: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - PTI/PTTK: 3 ml blood in BD vacutainer with citrate
    - Antiglobulin test/ Coomb's test: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - G6PD Deficiency: 6ml heparinized blood
    - Osmotic fragility test: 2ml blood in heparin /EDTA
    - Sickling test: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - HbF Estimation: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - LE cell Reaction: 3 ml clotted blood
    - LAP score: Fresh smear from finger prick
    - Sudan Staining: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg
    - Perl's Prussian blue reaction: Bone marrow smears
    - Clot retraction test: 5ml venous blood in an unscratched graduated centrifuge tube
    - Fibrin degradation Product: 2 ml of citrated blood
    - Latex agglutination test
    - Cell count in fluids
    - High performance liquid chromatography: 3 ml blood in BD vacutainer with K2 EDTA 5.4 mg

- Urine: 5 ml in Clean and sterile container

    - Physical examination : volume, odour, color, pH
    - Chemical examination : Strip test
    - Microscopic examination: Cells, casts, crystals

- Fluids: Fresh fluid in sterile container
    - Total cell count on Neubauer's chamber
    - Differential count on Leishman stained smear

C) <u>Tests done</u>:

1) Blood
2) Urine
3) Fluids

- Blood
  - Complete hemogram : Automatic cell counters
  - ESR estimation: Manually by Wintrobe's test
  - Retic count: Manually by supravital staining
  - PTI/PTTK: Automatic coagulation analyser
  - Antiglobulin test: Manually
  - G6PD Deficiency: Manually
  - Osmotic fragility test: Manually
  - Sickling test: Manually
  - HbF Estimation
    - Qualitative by Acid Elution test (kleihauer's test)
    - Quantitative by Alkali denaturation test or High performance liquid chromatography
  - LE cell Reaction
  - LAP score
  - Sudan Staining
  - Perl's Prussian blue reaction
  - Clot retraction test
  - Fibrin degradation Product
  - Latex agglutination test
  - Cell count in fluids

- Urine:

1) Complete analysis (by reagent strips) - Pus cells
   RBC
   Sugar
   Protein
   PH
   Specific gravity
   Urobilinogen
   Ketone
   Nitrite
   Bilirubin
2) Microscopic examination- WBCs, RBCs, Cast, Crystals
3) Fluids: Fresh fluid in sterile container

D) <u>Reporting time</u>

- Blood
  - Complete hemogram : 2 hours
  - ESR estimation: 2 hours
  - Retic count: 2 hours
  - PTI/PTTK: 2 hours
  - Antiglobulin test: 2 hours
  - G6PD Deficiency: 2 hours
  - Osmotic fragility test: 2 hours

- Sickling test: 2 hours
- HbF Estimation
- LE cell Reaction
- LAP score
- Sudan Staining
- Perl's Prussian blue reaction
- Clot retraction test
- Fibrin degradation Product
- Latex agglutination test
- Cell count in fluids: Immediately

Clinical Pathology Laboratory – Emergency Lab

(D2, block – Room no. 8)

A) Sample receiving

From emergency, ICU, RICU, ICCU and wards (critically ill patients) all days (24 ×7)

B) Type of samples and collection

1) Blood
2) Urine
3) Fluids- CSF, Pleural Fluid, Ascitic Fluid

- For complete blood count and ESR : 3 ml blood in K2 EDTA vacutainer 5.4 mg
- For coagulation studies : 2 ml blood in 3.2% Sodium Citrate vacutainer (blue capped)

- Urine: 5 ml in Clean and sterile container

- Fluids : 3-5 ml Clean and sterile container

C) Tests performed

- Blood-
  1) Hemoglobin estimation (Photocolorimeter- cyanmethhemoglobin Method)
  2) Complete blood count (Automatic analyser) - Hb, TLC, DLC, Platelets
  3) Peripheral blood examination by microscope (Leishman Stained smear)
  4) ESR (Manually- Wintrobe's Method)

- Bleeding time and clotting time
- Coagulation profile-
  1) PTI (automatic analyzer): sample value, control value, INR
  2) PTTK (automatic analyzer): sample value, control value, ratio

- Urine – 1) Complete analysis (by reagent strips)
  - Pus cells
  - RBC
  - Sugar
  - Protein
  - PH
  - Specific gravity
  - Urobilinogen
  - Ketone
  - Nitrite
  - Bilirubin

  2) Microscopic examination- WBCs, RBCs, Cast, Crystals

- Fluid examination: CSF, Pleural Fluid, Ascitic Fluid
  Performed using: Neubauer's chamber
  Reporting of fluids:
  TLC: Number of cells counted in four large corner squares x 2.5 per cumm OR number of cells counted in one large corner square x 10 per cumm
  DLC: On Leishman stained smear

D) <u>Reporting time</u>

- Complete blood count- 2 hours
- ESR: 2 hours
- Fluids and coagulation - Within 1 hour

<u>Specimen post-test</u>

•Period of retention – 24 hours

•Condition of storage – Stored at room temperature

<u>Specimen reception</u>
•Registration and check the test request form.

•Samples are checked for adequate quantity and properly filled details on the requisition form including patient's name, age, sex, emergency registration number, diagnosis and investigation required.

•Samples for CH are checked for the presence of clot.

<u>CRITERIA FOR REJECTION OF SAMPLES</u>

- Missing or inadequate identification
- Insufficient quantity
- Specimen collected in an inappropriate container
- Contamination suspected

• Inappropriate transport or storage

• Hemolysed and clotted blood sample

• Unknown time delay

SAMPLE REGISTRATION

• Sample is received and a unique laboratory number is given to each sample.

• In addition the details of the patient along with the unique laboratory number are recorded in the record register.

Safety precautions:

• Always wear personal protective equipments (protective clothing, gloves etc.) which are obligatory

• Prohibitions (smoking, food and drinks)

• Handling high risk blood samples follow the universal precautions.

Quality control procedures:

• Procedures for internal quality control (run daily for all the analytes)

• Instructions for participation in an external quality assessment scheme (Not done)

Maintainence:

• Lists the schedule for routine in house maintenance (daily, weekly) in the respective labs.

• Arrangements for maintenance of servicing with the company persons in case of shut down.

Clinical Pathology Laboratory – Ch. Ranbir Singh, OPD block (Third Floor, room no 346)

B) Sample receiving

From various OPDs on all working days from 9:00 AM- 3:00 PM

- Ground floor:
    - Orthopaedic department
    - Pain clinic
    - Geriatric clinic
- First floor:
    - Medicine
    - Gynaecology department
    - Super specialities department:
        - Cardiology

- Nephrology
- Rheumatology
- Neurology
- Clinical haematology
- Pulmonary medicine
- Endocrinology
- Gastroenterology

- Second floor:
  - Paediatric
  - Skin
  - Burn Plastic surgery
  - Paediatric surgery
  - General surgery
  - Surgical (Super specialities):
    - Cardiac Surgery
    - Neurosurgery
    - Urology
- Third floor:
  - ENT
  - Radiotherapy
  - Chest & TB

B) <u>Type of samples and collection</u>

1) Blood
2) Urine
3) Semen

- For complete blood count and ESR : 3 ml blood in K2 EDTA vacutainer 5.4 mg
- Urine: 5 ml in Clean and sterile container
- Semen: 3-5 ml Clean and sterile container

C) <u>Tests done:</u>

- Blood- 1) Complete blood count (Automatic analyser)
  2) Peripheral blood examination by microscope (Leishman Stained smear)
  3) ESR (Manually- Wintrobe's Method)

- Urine – 1) Complete analysis (by reagent strips):
  - Pus cells
  - RBC
  - Sugar
  - Protein
  - PH
  - Specific gravity
  - Urobilinogen
  - Ketone
  - Nitrite
  - Bilirubin

  2) Microscopic examination- WBCs, RBCs, Cast, Crystals

- Semen-
  1) Physical examination: Volume, colour, odour, Ph, liquefaction
  2) Complete Microscopic analysis-
     - Count
     - Morphology
     - Motile/Non-motile

D) <u>Reporting time</u>

- Complete blood count- 2 hours
- ESR: 2 hour
- Semen- Within 2 hours

<u>STANDARD OPERATNG PROCEDURES OF HISTOCHEMICAL STAINS DONE IN CLINICAL PATHOLOGY LAB</u>

<u>Leishman Staining:</u>

<u>Method</u>:

- Take an air dried blood smear on and glass slide
- Cover the smear with the undiluted stain.
  - Take care not to overflow with excess stain.
  - To standardize, count the number of drops (usually 7-10) required to cover the film (so that double the number of water can be added) and adjust the incubation time according to the result (usually 1–2 minutes, 3 minutes per WHO).
  - The undiluted stain both acts as a fixative and also partially stains the smear. Still, since the moisture content can vary it is better to fix the slide in Methanol before staining.
- Add twice the volume of pH 6.8 buffered water (i.e. if e.g. 7 drops of stain was used, then use 14 drops water) to dilute the stain,
  - Taking caution that the stain should not overflow (which will make the dilution inaccurate adding equal (instead of twice) volume of water.
- Mix the water with the stain underneath by gently blowing with a straw or using a plastic bulb pipette.
- Allow to stain for 10–12 minutes (time may require adjusting).
  - In this method, better ionization during the dilution by the aqueous buffer in this step is necessary to complete the staining.
  - During this incubation "the appearance of a polychromatic 'scum' on the surface of the slide is merely a result of oxidation of the dye components and can be ignored."
- Wash off the stain with clean (or filtered) tap water.
  - If the stain is tiped off instead of washing, this will leave a fine deposit covering the film. Wipe the back of the slide clean and stand it in a draining rack to dry.
  - The stained smear should grossly appear neither too pink nor too blue (verify final results microscopically).
  - If the tap water is highly acidic, resulting in smear turning grossly pink too fast or highly alkaline, resulting in the smear remaining too blue, try using boiled cooled water or filtered rain water or pH 6.8 buffered water which can be used as an additional flooding step after washing in running water.
- The slide should be air dried and can be viewed under microscope.

Sudan Black B Staining:

Methods and reagents:-

Fixative: -40% Formaldehyde solution

Stain: -Sudan black B (0.3gms in 100ml absolute ethanol)

Phenol buffer: -

- Dissolve 16gms crystalline phenol in 30ml absolute ethanol.
- Add to 100ml distilled water in which 0.3gm of $Na_2HPO_412H_20_2$ has been dissolved.

Working stain solution:-Add 40ml buffer to 60ml Sudan black B solution.

Counterstain:-May Grunwald Giemsa or Leishman stain

Method:

- Fix air dried smears in formalin vapour by keeping smears upside down on petridish containing 100%formalin i.e. 40%formaldehyde and pieces of filter paper. Keep in water bath at 70^oC x 15min.
- Wash with running water.
- Air dry.
- Suspend the slides in a coplin jar containing working solution for 45 min.
- Give 3 dips in 70% ethanol.
- Wash with running water.
- Air dry.
- Counterstain with Leishman stain.

Anti-Globulin Test/Coomb's test:

Direct antiglobulin test/coomb's test:

Procedure:

- Take 2 ml of EDTA blood.
- Take 1 drop of blood in a dry test tube.
- Fill the tube with normal saline (instead of DW to maintain tonicity of RBC's) and centrifuge for 5 minutes.
- Discard supernatant and again fill with normal saline (Repeat 3 times) and centrifuge for 5 minutes and discard supernatant.
- Take 1 drop of deposit +1 drop of Anti-human globin sera and incubate at 37^oC for 45 minutes.
- Put 1 drop of sediment on slide and put on coverslip and see under 10x.

Indirect Coomb's Test

Procedure:

- Take 2ml clotted blood, separate serum.
- Take O^{+ive} donor RBC's, wash thrice with normal saline, make 5% suspension of these cells by adding normal saline.
- Take 2 drops of serum + equal amount of donor RBC's (incubate at 37°C x 45 minutes)
- Wash with normal saline thrice (prewarmed to wash off non- specifically attached proteins not the absorbed complement and obtain a smooth suspension of cells) and prepare 5% suspension.
- Take 1 drop of above suspension + 1 drop of antihuman globin, mix well and incubate at 37°C x 45 minutes.
- Make smear and see for agglutination.

LE Cell Reaction (Lupus Erythematous)

Procedure:

- Take 5cc clotted blood.
- Separate serum, discard extra serum.
- Break the clot on sieve kept on petridish with bottom of glass vial
- Filter through sieve in petridish.
- Suck the filtered blood with pipette.
- Fill it in Wintrobe tube, almost filling it completely.
- Keep in water bath at 37°C for 30 minutes.
- Centrifuge for 30 minutes at 3000 rpm.
- 3 layers are formed.
- Pipette out plasma and prepare smear with 1 drop of buffy coat. Slide should be granular.
- Dry the slide.
- Do the Leishman staining.
- Look for LE body.

Reticulocyte count

Retic fluid:

- 3gms of Na citrate dissolved in 100ml of distilled to form 3% Na citrate.
- Add 400ml of normal saline-Citrated saline.
- Add 5gms of brilliant cresyl blue in 400ml citrated saline.

Procedure:

- Take a drop of blood+1 drop of retic fluid.
- Incubate at 37°C for 30min.
- Prepare the smear.

HbF/Fetal haemoglobin

Alkali denaturation test

Procedure-

- Take 2ml of EDTA blood. Wash RBCs 3 times with normal saline.
- Add 2-3 drops of DW to washed cells. Add equal quantities of chloroform to this i.e. 2 cc washed RBCs + 3 drops of DW + 3 drops chloroform.
- Centrifuge for 20minutes.3layers are formed (hemolysate, destroyed cells, $CHCl_3$+ H_2O
- Take 4 tubes

1st tube 3ml drabkin + 0.2ml lysate=3.2ml
2nd 0.2 ml NaOH (1.2M) (causes denaturation)
3rd 2 ml ppting solution of saturated ammonium sulphate 2 ml (stops the reaction)
4th blank tube

Drabkin's solution:

- Na bicarbonate 10 gm (not used here),
- K ferricyanide 200 gms,
- K cyanide 50 gms, Add to 100 ml of distilled water

- Add 2.8 ml of 1st tube to 2nd to make 3ml. Keep for 2 min (note time immediately).
- After 2 min, invert in 3rd tube. A precipitate will form. Wait for 10 minutes & filter it. If filtrate shows color then prepare the standard solution.
  (If filtrate is clear, HbF is absent).

Standard solution-

4.3 ml of drabkin solution and 0.7ml of 1st tube

Test/standard x 25=%; read the absorbance at 420 nm against a water blank.

>4%HbF is significant; below this level significance is dubious.

Acid Elution test (kleihauer's test):-

Prepare 3 slides, let the slides dry. **Fixative**-80% ethanol
Elution solution:-

Elution Solution A: Hematoxylin 7.5 gms in 90% ethanol (90 ml ethanol + 10 ml DW)

Elution solution B: $Fecl_3$ 2.4 gms in 2.5 mol/l Hcl 20 ml

For use: mix 5 vol. of A + 1 vol. of sol B

Counterstain-1gm/l aqueous erythrosine or 2.5g/l aqueous eosin

Procedure:

- Prepare 3 fresh air dried films
- Immediately fix in 80%ethanol for 10 minutes in coplin jar (20-30 minutes here).
- Rinse in water and air dry. Place slides in elution solution in coplin jar x 2 minutes.
- Wash with water. Counterstain in eosin x 2 minutes.
- Wash with tap water.
- Air dry.

Perl's Prussian blue reaction - Iron staining
Preparation of solution of HClKFeCN:

Solution A: 2 % Hcl

2 ml concentrated Hcl + 98 ml DW

Solution B: 2% Pottasium ferricyanide

2 gms KFeCN + 1000 ml of DW

Method:

- Fix smear with 95% methanol for 15 minutes. Wash with water and let it dry.
- Take 25 ml each of 2% HCL and 2% K ferricyanide solution and put it in coplin jar.
- Dip dried slides in above mentioned solution in coplin jar and place it in water bath at 56^0C for 45-60 minutes (till blue color appears – Perl's reaction).
- Wash the slides with distilled water for 20-30 minutes or 3 times to wash off the excess.
- Counterstain with 1% saffranin (in distilled water) for 30 seconds.
- Wash with tap water.

Osmotic fragility test

Procedure: -

- Collect 2 cc blood in Heparin /EDTA vial
- Test should be carried out within 2 hours of sample collection with blood stored at room temperature or within 6 hours if blood has been kept at 4^0C.

(In babies with limited available blood, take 1ml saline and 10µl blood).

- Take 12 small test tubes with normal saline and distilled water mixed in order to have solution of graded solution (as in table).
- Add 0.05 ml of blood (50µl - it must be same to all tubes).
- Wait for 10 minutesfor hemolysis to occur.
- Centrifuge at 1000 rpm x10 minutes or 1500 x 5 minutes.

Look for hemolysis: Normally hemolysis starts around 0.59%and ends 0.36%,50%around 0.49% and ends at 0.45%.(Results are best depicted on a graph paper).

	Normal Saline (ml)	Distilled water (ml)	Strength of Normal Saline		
1.	4.50	0.50	0.81%	- Blank	
2.	3.75	1.25	0.68%		
3.	3.25	1.75	0.59%		
4.	3.00	2.00	0.54%		
5.	2.75	2.25	0.49%	50%	Normal Hemolysis

6.	2.50	2.50	0.45%		
7.	2.25	2.75	0.40%		
8.	2.00	3.00	0.36%		
9.	1.75	3.25	0.31%		
10.	1.50	3.50	0.27%		
11.	1.00	4.00	0.18%		
12.	0.50	4.50	0.09%		100% hemolysis

G6PD Deficiency

Methaemoglobin Reduction Test:

Reagents:

- Solution A: DW 100ml
  Dextrose/glucose 5 gms
  Sodium Nitrite 125 mg

  Solution B: Methylene Blue 15 m g
  DW 100 ml
- PROCEDURE: Take 3 test tubes

Take 6 ml heparinized blood.

	Test (I)	Control(II)	Blank(III)
Blood	2.0 ml	2ml	2ml
Solution A	0.2ml	0.2	-
Solution B	0.2ml	-	-
Color		Brown	Red

Test:-2 ml blood + 0.2 ml G6PD soln + 0.2 ml 0.15% methylene blue incubate in water bath at 37ºC X 3hrs

Control:-2 ml blood + 0.2 ml G6PD soln→ Brown color

Blank:-2 ml blood → Red color

PTI/PTTK

Procedure:

- 0.2 ml of Na citrate + 1.8 ml of blood
- Mix by inverting tube (discard if clotted)
- Centrifuge x 10 mins (at 2000 rpm)
- Take 0.1 ml (100 μgm) of supernatant (i.e. plasma) with pipette already washed with NaCl; incubate at 37ºC in water bath x 2 mins-------(1)
- Mix thromboplastin powder with 10ml distilled waterin a vial by rolling between hands, take some in test tube and incubate in waterbath @ 37ºC x 5 mins
- Take 0.2ml of this reconstituted thromboplatin →incubate at 37ºC in water bath x 2 mins-----(2)
- Mix 1 & 2. Note time for clot formation while shaking continuously in waterbath. (Start shaking as soon as you put plasma into thromboplastin)

Activated Partial Thromboplastin Time (APTT)

Procedure:

- Take 1.8 ml blood + 0.2 ml of Sodium citrate.
- Centrifuge for 10 minutes.
- Take 0.1 ml of supernatant (plasma) and incubate at 37ºC x 2 minutes.
- Incubate N/40 $CaCl_2$ (made in saline) in tube in water bath x 5 minutes.
- Also keep APTT solution in tube in water bath x 5 minutes.
- Add 0.1ml of APTT solution to 0.1 ml of plasma.
- Keep in water bath x 2 minutes and then add 0.1 ml of $CaCl_2$.
- Note time taken for mixture to clot.

Clot Retraction Test (Platelet function test)
Procedure:

- 5ml venous blood in an unscratched graduated centrifuge tube.
- Insert coiled wire /stick in bottom of tube.
- Place at 37°C x 1hr.
- After clotting has occurred gently lift wire and allow attached clot to drain x 1-2mins.
- Read the volume of fluid remaining in tube.

Express volume as % of original volume of whole blood in tube

Fibrin Degradation Product

Reagent: 50% ethanol [equal amount of ethanol & distilled water]

- Sample is taken in PTI tube (citrated).
- Prepare solution of equal quantity of plasma + equal quantity of reagent.
- Reagent is poured from the side of tube.

White ring forms at junction of mixture → positive for FDP.

Peripheral Blood Smear

- Examination of a stained blood smear is a routine part of the complete blood count
- In stained smear various blood components like RBCs, WBCs and platelets can be identified and evaluated
- Provide valuable information for diagnosis like malaria, leukemia, anaemia
- Specific stains may be used to identify specific components of cells such as iron granules

Preparation of peripheral blood smear:

- Place a small drop of well mixed blood on slide
- Position the spreader slide in front of drop of blood at 30-35 degree angle
- Spread the blood with spreader slide by bring back edge of the spreader slide into contact with the drop of blood until the drop spreads along three quarters of the edge of the spreader slide
- Push the spreader slide forward to spread the blood into a smooth, quick sliding motion
- Place the smear in a slide drying rack and allow to air dry

Features of good blood smear:

- Cover one half to three fourth of slide
- Gradual transition from thick to thin
- Smooth appearance, with no holes or ridges
- Feathered edge at thin end
- Cell should be distributed evenly when examined microscopically
- Area at the thin end where cells are not overlapping

Precautions:

- Minimal alteration in the distribution of cells and morphology
- Specimen collection and handling
- Anticoagulated blood must be well mixed
- Smear should be made within 2 hours of blood collection
- EDTA as anticoagulant
- New slides, free from grease and dust

Common problems encountered in preparing blood smears and possible causes:

Problem	Possible causes
1. Smear too thin or too long:	Drop of blood too small, Spreader at low angle
2. Smear too thick or too short:	Improper speed, Drop of blood large, Spreader

	at high angle
3. Ridges/waves in smear:	Improper speed, Uneven pressure on spreader
4. Holes in smear:	Slides not clean
5. Uneven cell distribution :	Uneven pressure during spread of blood, Delay in spreading blood

High Performance Liquid Chromatography (HPLC)

High-performance liquid chromatography (**or high-pressure liquid chromatography**, **HPLC**) is a chromatographic technique that can separate a mixture of compounds, and is used in biochemistry and analytical chemistry to identify, quantify and purify the individual components of the mixture.

Components:

- The apparatus of a typical HPLC system includes
- An eluent system with different types of stationary phase
- A pump that moves the mobile phase(s) and analyte through the column
- An automatic sampler
- The analytical column
- A detector that provides a characteristic retention time for the analyte. - UV/V spectroscopy
- A recorder

Mechanics:

- The sample to be analyzed is introduced in small volume to the stream of mobile phase.
- The analyte's motion through the column is slowed by specific chemical or physical interactions with the stationary phase as it traverses the length of the column.
- Movement depends on the nature of the analyte and on the compositions of the stationary and mobile phases.
- The time at which a specific analyte elutes (comes out of the end of the column) is called the retention time; which is considered a unique identifying characteristic of a given analyte.
- The use of smaller particle size column packing (which creates higher backpressure) increases the linear velocity giving the components less time to diffuse sideways within the column, leading to improved resolution in the resulting chromatogram.
- Common solvents used include any miscible combination of water or various organic liquids (the most common are methanol and acetonitrile). Water may contain buffers or salts to assist

in the separation of the analyte components, or compounds such as trifluoroacetic acid which acts as an ion pairing agent.

Process:

- Samples are automatically mixed and diluted and injected into the analytical cartridge. Analysis takes a total of 6.5 min.
- Chromatographic stations dual pumps deliver a programmed buffer gradient of increasing ionic strength to the cartridge, where the HbF/A2 are separated based on their ionic interactions with the cartridge material.
- The separated HbF/A2 then pass through the flow cell of the filter photometer, where changes in the absorbance at 415 nm are measured.
- An additional filter at 690 nm corrects the background absorbance.
- The clinical data management CDM software performs reduction of raw data collected from each analysis
- One level calibration is used for adjustment of the calculated HbF/A2 values.
- Minor differences in separation efficiency of individual analytical cartridges are corrected by the use of the HbF/A2 calibrator
- A sample report and a chromatogram are generated by CDM for each sample

Procedure:

- Preparation of reagents
- Specimen collection
- Sample preparation
- CD ROM installation
- Cartridge installation, temperature adjustment and cartridge priming
- Run set up

Preparation of reagents:

- Wear gloves during reagent preparation
- Set elution buffers, wash solution and analytical cartridge
- Perform system flush
- HbF/A2 calibrator
- Reconstitute the HbF/A2 calibrator by adding 10 mL of diluent per vial
- Swirl gently to dissolve and ensure complete mixing.
- Allow it to stand for 10 min at 15-30C. Reconstituted calibrator is stable for 10 days when stored at 2-8C

- Transfer 1.0 mL of calibrator into appropriately labelled 1.5 mL sample vial.

Haemoglobin A_2 control:

- A set of normal (HbF-1-2%, HbA_2-1.8-3.2%) and abnormal (HbF-5-10%, HbA_2-4-6%) controls should be run at the beginning and end of each group of patient specimens.

Whole blood primer:

- It is used in the beginning of each run to condition the cartridge for analysis.
- It should be run twice to condition a new cartridge.
- Prepare the whole blood primer by adding 1 mL of de-ionized water to the vial
- Swirl gently to dissolve and ensure complete mixing
- Allow to stand for 10 min at 15-30C. Reconstituted primer is stable for 21 days when stored at 2-8C.

Specimen collection:

- Whole blood specimens are stable for 7 days when stored at 2-8C.
- Freshly collected specimens are stable for upto 24-48 hours at ambient temperature (22-24C)

Sample preparation:

- The 16 mm sample tubes can be loaded directly into the sample racks and placed on the conveyor belt.
- The 13 mm tubes and 10 mm paediatric tubes require special rack inserts.
- If the sample is in an abnormal size/type of tube or if there is less than 0.5 mL of sample in the tube, it should be prediluted manually by taking 1 mL of wash diluent in the sample vial followed by 0.5 µl of blood and mixed thoroughly after capping which are then kept in the 1.5 sample vial adapters.

CD installation:

- CDM has an update kit button on the SETUP/test screen that allows to download all assay parameters from CD-ROM.
- This will update all the elution buffers as new and cartridge with remaining 250 injections.
- Take care to match the number of the kit lot with the number on the CD.
- Each kit has a separate CD

New cartridge installation:

- Position the cartridge by keeping the arrow mark on the upper side.
- Don’t touch the ends of the cartridge, hold it in the middle.
- Place the cartridge into the thermomodule, first the lower end then the upper then tighten the screw.

- Close and secure the thermomodule.

Loading the samples:

- Load samples in the rack in the following order:
- Variant whole blood primer
- Variant whole blood primer
- Deionized water (DW)
- Deionized water (DW)
- Variant A2/F calibrator
- Variant A2/F calibrator
- STOP tube
- All these tubes are bar coded

Temperature adjustment:

- Start the RUN by selecting the RUN/worklist
- Press the start button
- After the run is complete, note the retention time of A2 in the second calibrator vial.
- Ideally the retention time should be 3.66±0.10.
- RT is inversely proportional to the cartridge temperature. Temperature has to be increased or decreased according to the RT.
- It is originally set at 32C
- If the retention time varies by more than 0.20 minutes, monitor the pump performance by measuring the flow rates and observing the readings. Call for technical assistance.
- Minor shifts in retention time (<0.05 min) reflect random run to run variability of the assay and do not require additional temperature adjustments.
- A shift of >0.05 min may occur due to aging of the cartridge resin and requires a second temperature adjustment.

Run setup:

- Prepare samples in rack as follows:
- Primer
- Blank/DW
- Calibrator

- Control level 1
- Control level 2
- Patient samples
- Control level1 & 2
- STOP tube

Interpretation of the results:

- Every haemoglobin produces a peak at a particular retention time.
- Retention time is the elapsed time from the injection of the sample to the apex of a haemoglobin peak

Result:

Peak name	Area%	Retention Time (min)	Peak Area	Old CF	New CF
F	6.2	1.14	162709	1.160	1.155
P2	-	1.34	146340	-	-
P3	-	1.72	113119	-	-
A0	-	2.31	2028212	-	-
A2	6.1	3.67	160078	1.157	1.158
D					
S					
C					

Calibration interpretation:

- The retention time should be 3.65±0.10 and the calibration response factor for HbA2 and HbF should be greater than 0.7 and less than 1.30.

Normal Haemoglobin Concentration in Adult Blood:

- Hb A-
- Hb A2- 1.75%-3.25%
- Hb F- < 1%

Abnormalities:

- Heterozygous HbA2 levels- 4%-9%
- Heterozygous condition HbF-1-5%
- Homozygous condition-HbF-80-100%
- Total area of each analysis should range from 1,000,000 to 3,000,000 µvolt/second. Results should not be reported if the area is outside this range.
- Values in excess of the reportable ranges for HbA2 and HbF should be reported as greater than 13% and 40% respectively
- Elevated P2 peak signifies elution with HbA1c as seen in Diabetic patients.
- Elevated P3 peak with area % more than 6% signifies sample degradation.
- Haemoglobin E is the second most frequently occurring haemoglobin which elutes with the HbA2 retention time.
- Differentiation from the HbA2 can be made with observation of area percentage.
- HbAE i.e HbE in heterozygous state shows a range of 30-35%

LIST OF EQUIPMENTS IN EMERGENCY LAB

•Hemoglobinometer – 1

•Binocular microscope - 1

•Centrifuge - 1

•Colorimeter

•Refrigerator – 1

•Distilled water apparatus – 1

•Micropipette – 1

•Three part analyser – 3

•Urine reagent strips

REFERENCE RANGE

HEMOGLOBIN

•Adult male: 13-17g/dl

•Adult female (non-pregnant): 12-15g/dl

•Adult female (pregnant): 11-14g/dl

•At Birth: 13.6-19.6g/dl

•2-6 months: 9.5-14.0g/dl

•6months-6years: 11-14g/dl

•6-12 years: 11.5-15.5g/dl

RBC Indices

-**MCV:**

- Adults: 92 ± 9 fl
- At birth: 110 ± 10 fl
- 1 year: 78 ± 6 fl
- 2-6 years: 81 ± 6 fl
- 6-12 years: 86 ± 9 fl

-**MCH**:

- •Adults: 29.5 ± 2.5 pg
- •At birth: 34.0 ± 3.0 pg
- •1 year: 27.0 ± 2.0 pg
- •2-6 years: 27.0 ± 3.0 pg
- •6-12 years: 29.0 ± 4.0 pg

-**MCHC:**

- •Adults: 330 ± 15 g/l

•At birth: 330 ± 30 g/l

•1 year: 340 ± 20 g/l

•2-6 years: 340 ± 30 g/l

•6-12 years: 340 ± 30 g/l

-**RDW (CV)**: 12.8 ± 1.2%

-**Total Leukocyte Count:**

•Adults: 4.0 – 10.0 × 10^9 /µl

•Pregnancy: upto 15.0 × 10^9 /µl

•At birth: 10.0 -26.0× 10^9 /µl

•1 year: 11 ± 5× 10^9 /µl

•2-6 years: 10 ± 5× 10^9 /µl

•6-12 years: 9 ± 4× 10^9 /µl

-**Differential Leucocyte Count:**

Neutrophils:

•Adults: 2.0 -7.0 × 10^9 /l (40- 80%)

•At birth: 4.0-14.0 × 10^9 /l

•1 year: 1.0-7.0 × 10^9 /l

•2-6 years: 1.5- 8.0 × 10^9 /l

•6-12 years: 2.0- 8.0 × 10^9 /l

Lymphocytes:

•Adults: 1.0 – 3.0 × 10^9 /l (20-40%)

•At birth: 3.0-8.0 × 10^9 /l

•1 year: 3.5-11.0 × 10^9 /l

•2-6 years: 6.0- 9.0 × 10^9 /l

•6-12 years: 1.0- 5.0 × 10^9 /l

Monocytes:

•Adults: 0.2- 1.0 × 10^9 /µl (2-10%)

•At birth: 0.5 -2.0 × 10^9 /l

•1 year: 0.2-1.0 × 10^9 /l

•2-6 years: 0.2- 1.0× 10^9 /l

•6-12 years: 0.2- 1.0 × 10^9 /l

Eosinophils:

•Adults: 0.02-0.5 × 10^9 /l (1-6%)

•At birth: 0.1 -1.0 × 10^9 /l

•1 year: 0.1-1.0 × 10^9 /l

•2-6 years: 0.1- 1.0× 10^9 /l

•6-12years: 0.1- 1.0 × 10^9 /l

Basophils:

•Adults: 0.02- 0.1× 10^9 /l (< 1-2%)

-**<u>Platelets</u>:**

•Adults: 280 ± 130× 10^9 /l

•At birth: 100-450 × 10^9 /l

•1 year: 200- 550 × 10^9 /l

•2-6 years: 200- 490 × 10^9 /l

•6-12 years: 170- 450 × 10^9 /l

E. Duties of Consultant, Demonstrators and Residents

a) Duties of consultant (Sr. Professor, Professor, Assoc. Professor, Asstt. Professor):

   i. Teaching of UGs courses & PGs courses.

   ii. Administration of department including for teaching labs, functioning of equation of equipment & their reagents with their maintenance.

   iii. Reporting of laboratory investigation pertaining to Histopathology, Cytopathology and Hematology.

   iv. Duties assigned by competent authority from time to time.

b) Senior Residents – There are no Senior Resident in the department.

c) Junior Residents – participate and learning in teaching activities of the UG,s courses run in the department.

F. Responsibility of Emergency Care – Department is running separate clinical emergency laboratory services in department of casualty and Apex Dhanwantri Trauma Centre. Diagnostic services provided include – CBC, PTI, PTTK, Body fluid examination for microscopy.

G. Detail of UG and PG teaching Programme – As on dated 05.03.2020 UG programmes run in the department-

- UGs – MBBS, BDS, Nursing etc.
- PGs – M.D.

Teaching rosters are sent to competent authorities. The department also collaborate with other department for their PGs training.

H. Hospital Rounds – Service laboratories are supervised by the faculty posted in respective sections on rotations basis.

External Quality Assessment Scheme (EQAS)

The following EQAS program are undertaken by the different laboratories in the department:

1. Histopathology and IHC staining

Program run with Tata Memorial and Research Institute Mumbai

2. Hematology Coagulation Profile

Program run with CM Vellore

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DEPARTMENT OF PAEDIATRICS

FACILITIES AVAILABLE/ PROTOCOLS/SERVICES PROVIDED

The department of Paediatrics provides care to neonates, children and adolescents upto the age of 14 years. The vision of department is to provide excellence in clinical care, training and research.

1. The department of Pediatrics has :

   Pediatrics has 12 Regular Consultants details of which are mentioned below.

   There are 4 Sr. Residents & 39 Postgraduates (Jr. Residents) working in the Pediatrics Department.

   Total Beds are as follows:

   A& E -12 Beds 1 Bed (Isolation)

   - 4 general pediatric units (140 beds: unit-I 40 beds, Unit-II 40 , Unit-III 30 & Unit-IV-30 beds)

   PICU(8 bedded)

2. **List of Faculty as per respective Units**

SR. NO.	NAME & DESIGNATION	QUALIFICATION
1.	Unit-I	MD, DM(Neonatology)
	Dr. Geeta Gathwala	
	Sr. Prof.	MD
	Dr. Poonam Dalal ,Professor	MD
	Dr. Kapil Bhalla, Assoc. Professor	
2.	Unit-II	
	Dr. Sanjeev Nanda Sr. Prof.& officiating Head	MD
	Dr. Alok Khanna Professor	MD
	Dr. Alka Yadav Assoc. Professor	MD
3.	Unit-III	
	Dr. Kundan Mittal Sr Prof & Head	MD
	Dr. Virender Gehlawat, Assoc. Prof.	MD
	Dr. Vandana , Assistant Prof.	MD
4.	Unit-IV	
	Dr. N.D. Vaswani Professor	MD
	Dr. J.S Kaushik , Assoc. Professor	MD, DM(Pediatric Neurology)
	Dr. Anjali , Assistant Professor	MD

3. Detail of OPD days

Unit	DAYS
I	Monday , Thursday
ii	Tuesday, Friday
iiii	Wednesday, Saturday
iv	Tuesday, Saturday

The following specialty clinics are being run with respective Days

a) Paediatric Neurology clinic = Thursdays
b) Paediatric Endocrinology clinic = Tuesday
c) Paediatric Nephrology clinic = Wednesday
d) Paediatric Gastroenterology clinic = Monday
e) Paediatric Respiratory clinic = Friday
f) Paediatric haemato-oncology clinic = Saturday

4. The Standard Operating Procedure applicable to Pediatrics are being followed.

1. Pediatric OPD [Outpatient] services are available daily [except Sundays and Gazetted holidays] on the second floor of the new air-conditioned 'Ch. Ranbir Singh OPD block'. There are six consultation rooms, one class room, OPD registration and drug-dispensing counter.
2. The department staff available for consultation include Consultants, Senior Resident and junior residents.
3. All GOI recommended vaccines are given in the **Immunization clinic in Room no.206**.
4. There is one trained Child Psychologist who gives daily services in Room No. 205. There is a large comfortable waiting area for the patients.
5. Patients are admitted through 2 channels. First who require work up regarding diagnosis and management are directly admitted from Out-patient Department in respective units on working days.
6. Second, those patients who present to A&E during 24 hours and if requires admission(critically sick child including newborns) are admitted to respective units as per roster.
7. All sick children are monitored ,stabilized and then subsequently shifted to the wards.
8. Department of Neonatology gives support to those critically sick newborns who require intensive neonatal care.
9. Department of Pediatric Surgery gives support to those children who require surgical care from Pediatric Emergency wards and general wards.
10. After admission to respective Units in either ward 14 or ward 16 round the clock patient care is provided by junior residents (atlleast 3 at a time) and staff nurses.
11. Senior residents of respective Units attend OPD on their respective days from 9 AM to 2 PM and after 1hours of lunch break go to A& E from 3PM to 9PM . After 9PM SR remain on call. Apart from this SR remain daily 12hours in the ward on non emergency days .

12. Consultants of respective units after OPD hours take A&E rounds, then ,ward rounds and attend PG Teachings. After duty hours Daily evening Consultant rounds of respective Units are present to provide round the clock patient care and guidance to Post Graduates.
13. A&E is attended by Consultants with morning, afternoon and evening rounds and remaining 24 hours on call on respective Call Days.
14. Hospital (Ward rounds) by faculty are done daily twice including Sunday and gazetted holidays as per duty roster which are duly sent to office of Director and MS on first of every month.
15. Paediatric Intensive care unit [PICU]has 8 beds. All critically sick children are managed here. It is fully equipped and staffed with availability of trained doctors round the clock. Facilities for monitoring, ventilation, peritoneal dialysis and Hemo-dialysis are available.

5. Details of UG/PG Teaching schedule

1. UG Teaching:

a. UG teaching starts from second prof with approx twelve theory lectures and clinical exposure in wards with ward classes taken by Consultants for 2 hours daily as per teaching roster.

b. Pre-final and final year undergraduate students have two hours OPD and two hour ward class daily taken by Consultants as per teaching roster.

c. Pre-final and final year undergraduate students have 1 hour theory classes as per teaching schedule taken by Consultants of the department.

2. PG Teaching:

   a. Daily 1 hour PG Teaching is done apart from Bedside Teaching by Seminar(1/week), Journal Club(1/week), Clinical Case Discussion(1/week), Mortality Meet(1/15 days), Didactic Lectures(1/week), College CPCs(1/15 days),Grand Rounds(1/week).

6. Special Information provided by Department

1. The department is running Thalassemia Day care centre where 350 Thalassemia children are availing benefits of regular Blood transfusions and drug chelation therapy provided by the institution.
2. The department is running Haemophilia Day care centre where patients are given Factor V11,V111,1X therapy provided by the institution. Facilities for Orthopaedic consultation and physiotherapy also exist.
3. Both diagnostic and treatment facilities are available for managing childhood cancers [like Leukaemias and solid tumors].

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DEPARTMENT OF PAEDIATRICS SURGERY

1. **FACULTY**

SR. NO.	NAME OF FACULTY	DESIGNATION
1.	Dr. Yogender Singh Kadian	Sr. Prof. & Head
2.	Dr. Pradeep Kajal	Professor

2. Nursing Sister = 02

3. Staff Nurses = 12

4. OT Master = 01

5. Bearer = 02

6. OPD Days = Monday, Wednesday & Friday, (Room No. 207,208 & 211).

7. OT Days = Monday, Tuesday & Thursday

8. Department provides following services/ facilities:-

- Out Patient service on Monday, Wednesday & Friday's in room no. 207, 208 & 211.
- Emergency - Services round the clock by consultants.
- Emergency – Operative services round the clock by the consultants.
- Emergency & Elective consultations to the allied departments

  (Obst. & Gynaecology, Pediatrics & General Surgery)
- All elective operative procedures in children from birth 14 years of age.
- Teaching (Theory & Practical) to MBBS, MD & M.ch & Nursing Students.

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DEPARTMENT OF PHARMACOLOGY

ADR MONITORING CENTER, PVPI

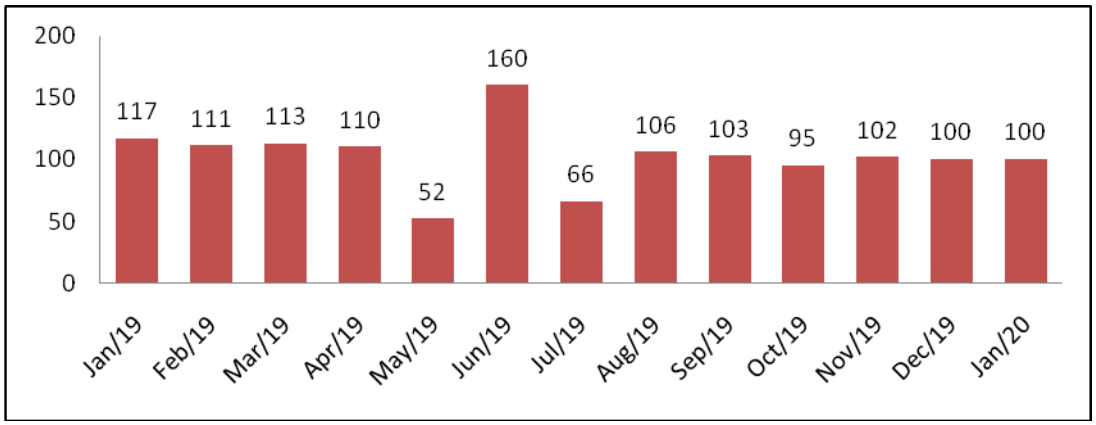
Adverse reactions of drugs continue to remain as an important public health issue. Safety monitoring of medicines is the responsibility of all stakeholders of the healthcare system since it continues to be an important cause of morbidity and mortality. The safety of patients and the safe use of medicines are crucial for health policy development and delivery of the best healthcare. To prevent or reduce harm to patients thereby improving public health, the safety of medicines in clinical use must be monitored and evaluated through specialised systems. This requires a well–organised pharmacovigilance system to be established.

The department of Pharmacology, PGIMS Rohtak is the ADR monitoring center (AMC) and is also the Nodal center for state of Haryana under Pharmacovigilance Programme of India (PvPI) by Indian Pharmacopoeia commission under the agies of Ministry of Health and Family welfare, Government of India.

This AMC is actively involved in collecting adverse drug events/reactions from various departments of the hospital. The various ADR collected are filled in the standard ADR reporting form as per PvPI guidelines and causality assessment is done to establish the association between suspected drug/s and adverse events. The completed ADRs are uploaded to Vigiflow (WHO-UMC Software) to be received at IPC, Ghaziabad which is the National Coordinating centre under this Programme. The information thus collected is gathered in national database and from there it is ultimately sent to WHO-UMC, Sweden. The process helps in making regulatory decisions regarding drugs like drug withdrawal/ban from marketing/adding black box warnings to the labels etc.,thereby ensuring safe use of the drugs.

Our AMC ranks among the top 10 Pharmacovigilance centers across the country with the high level of completeness of reports. We are contributing more than 100 reports per month to the national database. We have uploaded 1335 ADRs to Vigiflow in the last year (January 2019-January2020).

ICSR (ADR) uploaded per month



Coordinator: Dr. M.C Gupta, Senior Professor& Head, Department of Pharmacology PGIMS, Rohtak

Deputy Coordinator: Dr Savita Verma, Professor, Department of Pharmacology PGIMS, Rohtak

Dr Jyoti Sharma Demonstrator, Department of Pharmacology PGIMS, Rohtak

Pharmacovigilance Associate: Dr Rasita

We seek your kind assistance in making this process even more successful by bringing to our knowledge any adverse event you come across during patient treatment. You can send this information by filling the standard ADR form, to be downloaded from the official website of IPC http://ipc.nic.in/ /CDSCO http://www.cdsco.nic.in/ or simply contacting the Pharmacovigilance Associate (Details mentioned below).

Contact Details for reporting ADRs:
Dr Rasita
Pharcovigilance Associate

Contact no. 9468478381

You may whatsapp on 9468478381

PvPI Toll free Helpline No. 1800-180-3024 (Mon-Fri from 9 AM to 5 :30 PM)

Email: rasitaohlan@gmail.com, pvpi.ipcindia@gmail.com

Website: www.ipc.gov.in

NOTE: The ADR reporting form can be obtained from the ADR monitoring centre, Department of Pharmacology, PGIMS, Rohtak or can be downloaded from the following link **http://ipc.nic.in/index1.asp?EncHid=&lang=1&linkid=75&lid=254**

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DEPARTMENT OF PHYSIOLOGY

Yoga and Naturopathy OPD is running under Department of Physiology, Pt.B.D.S PGIMS, Rohtak, a unit of Central council for Research in Yoga & Naturopathy, New Delhi since 2009. OPD runs six days a week on full time basis in the Ch. Ranbir Singh OPD Room No. 106. Patients suffering from chronic and lifestyle disorders are visiting the OPD to get benefit of Yoga and Naturopathy advice is provided free by Yoga and Naturopathy physician. Naturopathy home remedies and counselling for positive lifestyle modifications are also provided by the Physician in the OPD which is showing a good response. In addition to the regular OPD, Yoga therapy classes are also conducted by Yoga Therapist in Indira Gandhi Vidya Bhawan, North Block, Pharmacy college, gate no. 3, at Pt. B.D.S. PGIMS, Rohtak. Regularly six batches of yoga therapy, of one hour duration each is being conducted by yoga therapist on fulltime basis. A good number of patients are benefitted and about 70-80 patients attend the therapy classes daily. The department also teaches patients prescribed asanas, pranayamas depending on their diseases. Meditation classes, yoga nidra, trataka and other yoga techniques on regular intervals are conducted.

International yoga day is celebrated on 21st June, which is attended by large number of faculty, students, staff members and regular yoga practitioners. Day to day lot of people are getting aware of the importance of Yoga and Naturopathy in maintaining healthy life style and to stay healthy. Yoga practices are not exercise as is usually understood. Yoga do not involve any vigorous movements as in exercise. For practicing Yoga, the place should be well ventilated with sufficient light and free from noise. Ground should be plain and flat. Practice should not be done with full stomach, clothes should be clean, simple and as per the climate. In yoga, Asanas are one of the best static stretching procedures and should be performed slowly and smoothly with maintaining stability and comfort. It is classified in three types as Meditative asanas, Cultural asanas and Relaxative asanas. Meditative asanas are sitting postures which maintain body in steady and comfortable condition and by various arrangements of legs and hands, different meditative asanas as Padmasan, Siddhasana, Sukhasana etc. are performed. Dhayana, Om chanting etc. are the best postures for doing meditation to keep the whole nervous system in normal condition. Cultural asanas are static stretching which brings proper tone of muscles and contribute to the flexibility of the spine.

There are numerable varieties performed in sitting, lying, and standing position are Vakrasana, Mandukasana, Ardhmatsyendrasana etc. performed in sitting which are useful in diabetes. Pawanmuktasana, Uttanpadasna, Naukasana etc. performed in supine position are useful in back pain, sciatica, neck pain etc. Relaxative asanas are performed in lying position and are meant for giving rest to the body and mind. They are useful in nervous disorders, anxiety neurosis, insomnia, hypertension and stress related physical and mental tiredness. Students of various streams are also taught about yoga.

Electro diagnostic test nerve conduction velocity is also performed in the department of Physiology, Pt.B.D.S PGIMS Rohtak in aseptic conditions. In nerve conduction studies, surface electrodes are placed at different locations along specific peripheral nerves and the nerve is stimulated and action potential is recorded and the nerve conduction velocity is determined in specific conditions. Each electrical stimulation is recorded as a wave form on a computer and analysed. Standard nerve conduction studies typically include motor nerve conduction and sensory nerve conduction and the specific parameters latency, conduction velocity and amplitude are analysed.

DETIALS OF FACULTY MEMBERS IN THE DEPARTMENT OF PHYSIOLOGY IS AS UNDER:

1. Dr. Jyoti Yadav, Sr.Prof. & Head
2. Dr. Kiran Singh, Professor
3. Dr. Sukhdev Chandla, Professor
4. Dr. Beena, Professor
5. Dr. Anupama, Professor
6. Dr.Geetanjali, Professor
7. Dr. Dipti, Professor
8. Dr.Sat Pal, Associate Professor
9. Dr.Mridul, Associate Professor
10. Dr. Shelja, Assistant Professor

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DEPARTMENT OF PCCM

A: Units: ONE

B: Details of faculty

1. Dr Dhruva Chaudhary- Senior professor and Head of Department
2. Dr Rajesh Gupta- Professor
3. Dr Manjunath B G- Assistant professor
4. Dr Pawan Kumar Singh- Assistant Professor
5. Dr Diksha Tyagi- Assistant Professor

C: Details of OPD

1. General Pulmonology OPD- Monday/Thursday/Saturday
2. ILD clinic- Thursday/Saturday
3. Lung cancer clinic (thoracic oncology clinic)- Thursday/Saturday
4. Airway disease and Sleep clinic- Monday/Saturday
5. Post Critical illness clinic- Monday/Thursday

Details of Bronchoscopy days: Tuesday (Dr Pawan Kumar Singh), Wednesday (Dr Manjunath BG), Friday (Dr Diksha Tyagi)

Details of Ward rounds- Daily

Details of ICU and day care rounds- Morning and evening daily

D: Services provided: Department of Pulmonary and Critical Care Medicine provides following specialty services

1. Flexible Bronchoscopy
2. Thoracoscopy
3. Rigid bronchoscopy (coring, dilation, stenting, electrocautery, foreign body removals)
4. Endobronchial ultrasound guided TBNA
5. Polysomnography
6. Pulmonary function tests like spirometry, DLCO, body box
7. Comprehensive lung cancer management (diagnosis, treatment, palliative interventions and palliative care)
8. Intensive care unit including facility of CRRT
9. Day care unit (high dependency unit)
10. Ultrasoundguided procedures like FNAC, biopsy, pleural taps, ICTD placement, pigtail placements and IPC insertions
11. Special clinic like Lung cancer clinic (thoracic oncology clinic), ILD clinic, Airway and sleep clinic and critical illness follow up clinic (respective days are mentioned above)

E: Duties of consultants-Dr Dhruva Chaudhry- ICU in charge and Head of the unit

Dr Rajesh Gupta- Ward and infections pulmonology including TB and MDR TB management

Dr Manjunath BG- Airway clinic, interventions pulmonology, Sleep clinic

Dr Pawan Kumar Singh- Lung cancer clinic, interventional pulmonology

Dr Diksha Tyagi- ILD clinic and interventional pulmonology

Duties of Senior Residents (DM fellows and non-academic SRs)- Academic presentations (Seminar, journal clubs, mortality meeting), assigned duties like ward, ICU, day care, bronchoscopy and sleep and call duties.

Junior Residents- ICU, day care and Ward postings

F: Emergency care: Provides ICU facilities including ventilation, hemodynamic resuscitation and monitoring for emergency patients from both medicine and surgery departments.

G: UG teaching- ICU (A & E) and causality posting of pre-final year MBBS students, Critical care classes for final year MBBS students.

H: Hospital Rounds including emergency department by Dr Dhruva Chaudhry on Friday every week.

Department of Pulmonary And Critical Care Medicine, PGI, ROHTAK

The Department of Pulmonary and Critical Care Medicine (PCCM) is committed to caring for patients with diseases of respiratory system including lung, chest wall & ventilation & sleep disorder along with management of critically sick with patient with multi organ failure. We provide diagnostic & treatment modalities based on basic sciences, novel therapies and research. Department not only provide the best possible patient care but also imparting training & clinical skills to trainees. Department has several research projects going to improve understanding of disease and health. Mission of the department is to deliver excellent patient care, to develop new knowledge about the field in both health and disease and to train individuals to be skilful clinicians and researchers.

What We Focus On

- **Patient Care:** Pulmonary and Critical Care Medicine serves as a regional referral centre for both the inpatient and outpatient evaluation of a broad range of Pulmonary & sleep disorder as well as critically sick patients with respiratory failure & multi organ disorder.
- **Education:** Pulmonary and Critical Care Medicine assumes a prominent role in the overall educational mission of undergraduate, postgraduate and doctorate fellows.
- **Research** : Research performed within the Pulmonary and Critical Care Medicine has greatly impacted our understanding of basic pathogenesis, lung biopsy and targeted therapeutics

Under the guidence of Head and Senior Professor Dr Dhruva Chaudhry and Assistant Professor Dr Neetu Jain the Department of Pulmonary and Critical Care Medicine (PCCM) has following facilities:

1) **Intensive Care Facility:** Intensive care unit has well equipped 19 bedded ICU along with attached High dependency unit. It caters not only respiratory patient but also medical, surgical, trauma and obstetric patients. Intensive care unit is equiped with intensive monitoring system including 12 channels monitors, 2D portable ECHO machine with vascular probe and portable USG machine. 12 channels monitor is capable of monitoring ECG, Pulse rate, both invasive & non invasive blood pressure, CVP, EEG, TOF(Train of four), BIS (Bispectral index), SpO2. Procedures like USG guided central line, Screening ECHO, Peritoneal dialysis catheter insertion, fiberoptic bronchoscopy and Percutaneous tracheostomy are routinely done.

2) **Outpatient services:** Outpatients facility have ASTHMA AND COPD CLINIC, ILD clinic, SLEEP CLINIC, LUNG CANCER CLINIC and caters all patients of respiratory disease .
3) **Bronchoscopy:** Bronchoscopy is a endoscopic technique of visualisation of respiratory system. Both diagnostic and therapeutic fiberoptic bronchoscopy is done involving procedures like Bronchoalveolar lavage, Transbronchial lung biopsy and Endobronchial lung biopsy. Department has both video and non video fiberoptic brochoscope and perform nearly 500 bronchoscopy in a year.

4) **Pulmonary function testing:** Department has well established , dedicated pulmonary function testing lab where we have facilities of spirometry, complete lung function with diffusion, 6 minute walk test and plethysmography. Lab has well trained and dedicated staff (technician).
5) **Sleep clinic:** At the Sleep clinic, we focus on sleep related breathing disorders which include sleep apnea. We guide patients towards effective treatment with mechanical, dental, or surgical approaches as per their particular needs. There is a well equipped sleep lab in the departement with facilities for both diagnostic and titration studies. The dept. also have portable sleep study setup. We have conducted various research projects in the field of sleep medicine including in those with critical illness, pregnancy & snake bite with neuroparalysis.
6) **DM program:** The dept. is one of the very few centers in the country which is running MCI recognized doctorate (DM in Pulmonary & critical care medicine) program in the subject with an input of 2 fellows per year since 2012. The fellows are imparted knowledge & skill in diagnosis and management of patients suffering for respiratory disorders and critically ill patients of all specialities. The fellows also learn various procedures (both diagnostic & interventional) with strict academic activities, case discussions & interactions, hands on training under the able guidance of the vastly experienced faculty.
7) **Indoor services:** Apart from the indoor services offered in ICU & HDU the dept. has a general ward with 12 beds for hospitalization of those requiring admission for pulmonary disorders. We have facilities for staging & administration of chemotherapy for lung malignancies.

8) **Pleuroscopy:** The faculty has the expertise in pleuroscopy(visualization and sampling of pleural cavity through scope) & the same is done frequently in those with pleural disorders not diagnosed with other diagnostic modalities like thoracocentesis, closed pleural biopsy etc. Pleurodesis and adhesonolysis of septations are also carried out during the procedure.
9) **Ultrasonography:** OPD basis USG of thorax along with guided lung FNAC and truecut biopsy for diagnosis of pulmonary disorders are done on regular basis. Point of care 2D Echocardiography is also done for cardiac involvements in both ICU & OPD basis.

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DEPARTMENT OF REGIONAL INSTITUTE OF OPHTHALMOLOGY

The Department of Ophthalmology was established in the year 1963 and then upgraded to Regional Institute of Ophthalmology in the year 2006. The Institute comprises of sufficient number of faculty members, residents and other para medical staff.

Services being provided at RIO.

1. Clinical Services to needy patients on every OPD day & admitted patients.
2. UG and PG teaching- Medical and B. Sc. Optometry students as per schedule
3. Research and guidance to the postgraduate students
4. Medical examination as per referral from Civil Surgeon through Medical Superintendent Office or special board for cases requiring specific opinions as per directions of M.S. PGIMS.
5. Education to the patients and community regarding prevention and management of eye diseases and eye donations.
6. Community eye care services by organizing eye OPD camps with the help of NGO's

FACULTY LIST

OPD – DAILY (6 DAYS)

Sr. No.	Name of Faculty	Designation
1.	Dr.S.V.Singh	Sr.Prof.& Head
2.	Dr.J.P.Chugh	Sr.Prof.
3.	Dr.V.K.Dhull	Professor
4.	Dr.R.S.Chauhan	Professor
5.	Dr.Manisha Rathi	Professor
6	Dr.Neebha Passi	Professor
7.	Dr.Manisha Nada	Professor
8.	Dr.Urmil Chawla	Professor
9.	Dr.Ashok Rathi	Professor
10.	Dr.Sumit Sachdeva	Professor
11.	Dr.Reena Gupta	Assoc. Prof.
12.	Dr. Jitender Phogat	Assoc. Prof.
13.	Dr.Jyoti Deswal	Asstt. Prof.

OPD DAYS	NAME OF CONSULTANT
Monday/Wednesday/Friday	Dr.S.V.Singh Dr.V.K.Dhull Dr.Manisha Rathi Dr.Manisha Nada Dr.Sumit Sachdeva Dr. Jitender Phogat
Tuesday, Thursday, Saturday	Dr.J.P.Chugh Dr.R.S.Chauhan Dr.Neebha Passi Dr.Urmil Chawla Dr.Ashok Rathi Dr. Reena Gupta Dr.Jyoti Deswal

O.T. – DAILY (6 DAYS)

OT DAYS	NAME OF CONSULTANT
Monday	Dr.R.S.Chauhan Dr.Urmil Chawla Dr.Ashok Rathi Dr.Reena Gupta
Tuesday	Dr.S.V.Singh Dr.V.K.Dhull Dr.Manisha Rathi Dr.Manisha Nada Dr.Sumit Sachdeva Dr. Jitender Phogat
Wednesday	Dr.J.P.Chugh Dr.R.S.Chauhan Dr.Neebha Passi Dr.Urmil Chawla Dr.Jyoti Deswal
Thursday	Dr.S.V.Singh Dr.V.K.Dhull Dr.Manisha Nada Dr.Jitender Phogat
Friday	Dr.J.P.Chugh Dr.Neebha Passi Dr.Ashok Rathi Dr. Reena Gupta Dr.Jyoti Deswal
Saturday	Dr.Manisha Rathi Dr.Sumit Sachdeva Dr. Jitender Phogat

SPECIAL CLINICS

NAME OF CLINIC	FACULTY
Glaucoma Services (Monday, Wednesday, Thursday)	Dr. Manisha Rathi Dr. Sumit Sachdeva
Oculoplasty Squint Services, Paediatric Ophthalmology (Tuesday, Thursday, Saturday)	Dr. Neebha Passi Dr. Urmil Chawla Dr. Reena Gupta
Vitreo Retina Services (Monday, Wednesday, Friday,Saturday)	Dr. S.V. Singh Dr. V.K. Dhull Dr. Manisha Nada Dr. Jitender Phogat
Cornea Services (Tuesday, Thursday, Saturday)	Dr. J.P. Chugh Dr. R.S. Chauhan Dr. Ashok Rathi Dr.Jyoti Deswal
Low Vision Aid Services (Wednesday,Thursday)	Dr.Sumit Sachdeva Dr.Reena Gupta Mr.Ramesh Hooda

SOP

1. CATARACT SERVICES

1. Patient suspected of being affected with cataract are being evaluated in the general OPD every working day.
2. Surgical treatment is being provided as per the requirement of the patient after fitness from Anaesthesia Deptt.
3. The patient after cataract surgery is usually discharged on the day of surgery or one day after surgery as per requirement & condition of the patient.
4. Patients are asked to come for follow up on the next day and then subsequently as advised.
5. Glasses if required after cataract surgery are prescribed 4-6 weeks after surgery.

2. REFRACTION SERVICES

1. Patient suspected of being affected by refractive error are being evaluated in the general OPD every day.

2. Services being provided

a) Recording of visual acuity
b) Auto refraction
c) Refraction
d) Dry and wet retinoscopy in case of children
e) Prescription of glasses to the patients with refractive errors.

3. GLAUCOMA SERVICES

1. Patient suspected of being affected with glaucoma are being further evaluated in the glaucoma clinic.

2. Services being provided

a) Direct /Indirect Ophthalmoscopy for optic nerve head examination
b) Slit Lamp Biomicrosocpic Examination
c) Tonometry for intraocular pressure measurement
d) Gonioscopy for anterior chamber angle evaluation
e) Pachymetry for Central Corneal Thickness
f) Visual Field Evaluation by Automated Perimetry.
g) Optical Coherence Tomography

3. Glaucoma management services

4. Patient awareness and education programmes are held in the department.

Medical and surgical treatment are being provided as per requirements.

4. OCULOPLASTY, STRABISMUS, PAEDIATRIC OPHTHALMOLOGY SERVICES

Services being provided

Medical and Surgical facilities for disorders of:

- lid
- Lacrimal system
- Orbit

5. PAEDIATRIC OPHTHALMOLOGY SERVICES

Facilities for **medical** (optical) treatment of:

- Amblyopia
- Refractive errors
- Nystagmus
- Neuro-Ophthalmology disorders.
- Corticovisual Impairment and Low vision disorders

Surgical Facilities for:

- Strabismus Surgeries simple and complex
- Paediatric cataract surgery with Posterior Capsulotomy and Anterior Vitrectomy with or without IOL implantation with Visual Rehabilitation.
- Nystagmus Surgeries

6. VITREORETINA SERVICES

Vitreoretinal diseases-

Patients requiring diagnosis and treatment of vitreoretinal diseases are evaluated clinically using direct and indirect ophthalmoscopy as per the OPD schedule.

Services being provided

- Slit lamp examination (+78D and +90D)
- Tonometry
- Fundus Examination
- Fundus fluorescein angiography
- Ophthalmic Ultrasonography
- Optical coherence tomography
- Ocular electrophysiological tests

The facilities for medical/ laser/ surgical treatment are provided.

7. LOW VISION AID SERVICES

- Refraction
- Low Vision Aid trial & prescription
- Counselling of patient with low vision

8. RETINOPATHY OF PREMATURITY SERVICES-

Best possible services are provided for ROP screening and its treatment as per schedule.

9. CORNEA SERVICES

CORNEA CLINIC

Patient requiring treatment for corneal diseases are being evaluated and managed in cornea clinic. Medical Management and Surgical Management like keratoplasty and amniotic membrane transplantation are done. Facility for corneal collagen crosslinking (C_3R) for management of Keratoconus is available.

DIAGNOSTIC PROCEDURE AVAILABLE-

Slit lamp examination,
fluorescien staining,
pachymetry
Live specular microscopy.
Cadaveric specular microscopy

10. EYE BANK SERVICES

1. Pledging and registration for eye donation at Eye OPD Counter from 9:00 AM to 1:00 PM daily.
2. Collection of donor eye 24 x 7 (round the clock) Eye Bank Ph.No.282300 & A& E 281304.
3. Utilization of donated eyes
   a. Optical keratoplasty as per waiting list.
   b. Therapeutic/Tectonic Keratoplasty at the earliest possible as per availability of cornea.
   c. Research Purposes.

All the patients attending Eye OPDs are being taken care of by trained faculty and residents as per the facilities available. Any grievances of the patients are being sorted by the concerned Head of Units accordingly on the respective OPD days.

11. EMERGENCY CARE

1. Jr. Residents, Sr. Residents and Consultants are deputed for emergency duties 7 days a week (including holidays) as per the duty roster.
2. All type of ophthalmic emergencies are dealt with 24 hours a day 7days a week.
3. The patients requiring emergency operations are taken up for surgeries in Minor O.T./Main O.T. at the earliest possible in collaboration in anesthesia deptt.

12. ELECTIVE CARE AND ELECTIVE SURGERY

All the patients who require admission in the Ward for elective care are admitted daily for respective diseases management and surgery.

13. UG AND PG TEACHING PROGRAMME

a) UG TEACHING

i) Undergraduate teaching roster is prepared and the classes are held as per roster involving all the faculty members by rotation.
ii) Two undergraduate practical classes are held in the department daily as per teaching roster.
iii) At least two undergraduate classes per week are taken by every consultant and senior residents.

b) POSTGRADUATE TEACHING

i) Teaching classes for postgraduate students are held 3 times a week.

ii) It involves case presentations seminars to presented by postgraduate students.

iii) Didactic lectures are also held by the faculty members.

iv) At least one PG class is taken by every consultant every week.

14. OUTDOOR SERVICES

i) Outdoor patient services are provided six days a week as per the duty roster .

ii) Two units carry out the OPD services per working day.

iii) The patients are diagnosed and managed according to their ophthalmic problem and medications are prescribed.

iv) The medicines available in hospital dispensary are provided free cost of the patient.

15. INDOOR SERVICES

1. Ward rounds are held daily by the Senior Residents and consultant on duty including Sundays.
2. The patients admitted in the ward are discharged after consultation with the consultant on duty and proper discharge summary handed to them

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DEPARTMENT OF RADIOLOGY

Details of facilities available/services provided:-

Conventional X-ray :-
Working 24x7. Conventional, Digital (CR & DR).

Conventional Radiographic Investigation- Barium studies & other contrast studies like IVP, HSG, MCU.

Mammography:- 01 Machine, done after fixing.

Ultrasound- 10 Machines

Working 24x7. Doing all types of Sonography examination alongwith guided procedure like FNAC/Drainage etc.

CT Scan:- 02 Machines (16 Slice & 4 Slice)

Working 24x7. Following studies are being performed:-

1. Routine non contrast and contrast imaging of Head and Neck, Chest, Abdomen, Pelvis and Extremities
2. CT angeography- Cerebral
   - Body
   - Extremities
3. CT guided FNAC/Biopsy

MRI :- 02 Machines (1.5T & 3.0T)

1. Routine non contrast and contrast MRI of Brain, Spine & body.
2. MR Angiography, MR Lymphogrpahy, Perfusion studies- (T2*W, permeability studies and non-contrast perfusion study i.e. ASL- Arterial Spin labelling), CSF flow study, MR Neurogrpahy, Cardiac MR (Non-quantitative), MR Arthrography, Liver & Cardiac Iron Quantification, Non-contrast perfusion (ASL- arterial spin labelling), DTI studies

Standard Operating Procedure:-
For OPD Patients - X-ray, Ultrasound and Mammography are done on same day. CT, MRI & other investigation are given dates and usually done with in 1-3 days.
For Indoor Patients – Services are available round the clock for X-ray, Ultrasound and CT.
General Anaesthesia Patients:- Fixed for Wednesday.
Non Emergency Angiography CT- Fixed for Thursday & Friday.
Dispatch of Reports:-
OPD Patients – X-ray next day & CT/MRI within 3days.
Indoor/Emergency Patients - Same day

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DEPARTMENT OF RADITION ONCOLOGY

The services being provided in Radiotherapy Department along with Standard Operating Procedures (SOPs) are as under:

1. Radiotherapy OPD services (including new patients and follow-up patients)

   The patients are registered in the HMIS (Hospital Information System) at the reception. For new patient, a unique ID is generated and a unique RT number is assigned. A file is made in which a doctor records the patient clinical details, examine the patient, all investigations done so far are reviewed and those further needed are advised. Histopathology of the patient is reviewed in PGIMS Rohtak and suitable treatment advised which may be Radiation therapy, Chemotherapy or Surgery either alone or in combination depending on the stage of the disease and patient & tumor factors.

2. Indoor patient care

   Those patients who need admission for chemotherapy, Radiotherapy or supportive treatment are admitted in ward no 23. An indoor file is made with a unique Central registration (CR) number in which a doctor records the patient clinical details. Accordingly suitable treatment is started which may be Radiation therapy, Chemotherapy or supportive treatment either alone or in combination depending on the stage of the disease and patient & tumor factors.

3. External Radiation Therapy. There are following three teletherapy machines in the Department:

   a) Theratron780E (# 690)
   b) Theratron Equinox-80 # 2039
   c) Theratron Equinox-80 # 2071

   External Radiation Therapy on these tele therapy machines is started for curative or palliative purposes, depending on the stage of the disease and patient & tumor factors. The histopathology report is verified before starting radiation therapy.

4. Quality control for radiation therapy as per Atomic Energy Regulatory Board guidelines.
5. Chemotherapy for indoor patients is given for curative or palliative purposes, depending on the stage of the disease and patient & tumor factors.
6. Day care Chemotherapy on OPD basis is given for curative or palliative purposes, depending on the stage of the disease and patient & tumor factors.

7. Radiation safety maintenance for staff as per Atomic Energy Regulatory Board guidelines is assured by the Radiation Safety Officers working in the Department.

DETIALS OF FACULTY

Sr.No.	**Name of Consultant /Physician**	**OPD Days**
1	Dr. Vivek Kaushal	Monday, Wednesday and Friday
2	Dr. Ashok Chauhan	Tuesday, Thursday and Saturday
3	Dr. Rakesh Dhankar	Monday, Wednesday and Friday
4	Dr. Rajeev Attri	Monday, Wednesday and Friday
5	Dr. Parmjeet Kaur	Tuesday, Thursday and Saturday
6	Dr. Naryan Parshad	Tuesday, Thursday and Saturday
7	Dr. M. Balasubramanian	Tuesday, Thursday and Saturday
8	Dr. Anil Dhull	Monday, Wednesday and Friday
9	Dr. Anil Khurana	Tuesday, Thursday and Saturday
10	Dr. Yashpal Verma	---

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DEPARTMENT OF DERMATOLOGY, VENEREOLOGY & LEPROLOGY

OUTPATIENT SERVICES

Dermatology consultation regarding various skin, hair and nail disorders is provided daily on Outpatient basis in the department. Various skin diseases like bacterial, fungal and viral infection of skin, psoriasis, bullous disorders, acne, scabies and pediculosis, disorders of keratinization, lichen planus, contact dermatitis etc. are diagnosed and treated. In addition, consultation for hair disorders like various types of alopecias, telogen effluvium, hair shaft disorders and scalp disorders are managed. Treatment of various nail diseases like onychomycosis, periungual warts, ingrown toe nail, nail dystrophies are also regularly provided.

SPECIAL OUTPATIENT CLINICS

Department is running the following special clinics on outpatient basis in order to provide special care to these patients:-

1. **Sexually Transmitted diseases Clinic**: In this clinic, patients of genital ulcerative diseases (like chancroid, syphilis, lymphogranuloma venereum, herpes genitalis etc), urethral discharges (like gonorrohoea and non-gonococcal urethritis), balanoposthitis and genital warts are examined, investigated and treated. The patients of this clinic are followed up on every Tuesday.
2. **Leprosy Clinic:-** In this clinic, patients of leprosy are evaluated, investigated and treated. Multidrug therapy both for paucibacillary & multibacillary leprosy is given according to National Leprosy Eradication Programme. Management of type-I and type-II leprosy reaction is also done in this clinic. The patients of this clinic are followed up on every Friday.
3. **Vitiligo Clinic:-**In this clinic, patients of vitiligo are fully examined, treated and followed up regularly. According to the severity of the diseases and the requirement of the patient the appropriate management with topical modalities, systemic treatment or phototherapy with Narrow Band Ultraviolet-B is done. The patients of this clinic are followed up on every Saturday.
4. **Psoriasis Clinic:-** In this clinic patients with psoriasis are evaluated, investigated and treated regularly. According to the severity scoring of psoriasis, patients are advised appropriate treatments in the form of topical, systemic therapy and phototherapy. The patients of this clinic are followed up on every Thursday.
5. **Autoimmune/vesicobullous diseases clinic:-** In this clinic patients with autoimmune/bullous diseases i.e pemphigus vulgaris, pemphigus foliaceous, bullous pemphoid, lupus erythematosus, systemic sclerosis etc. are evaluated, investigated and treated regularly. The patients of this clinic are followed up on every Monday.
6. **Pigmentary Clinic:-** In this clinic patients with various pigmentary disorders i.e. melasma and other hyperpigmentary disorder are evaluated, investigated and treated regularly. The patients of this clinic are followed up on every Wednesday.

INPATIENT SERVICES

Dermatology patients suffering from autoimmune bullous disorders, erythroderma, severe drug reaction, leprosy reactions and other dermatological emergencies are admitted in the dermatology ward and are given round the clock inpatient care and management. Pulse therapy including dexamethasone–

cyclophosamide, dexamethasone-azathioprine, dexamethasone-methotrexate, dexamethasone pulse is instituted for patients of pemphigus on regular basis.

DERMATOLOGIC DIAGNOSTIC SERVICES

Various diagnostic procedures like potassium hydroxide (KOH) mount, Tzanck smear, smear for Gram stain, smear for candida, acid fast bacilli staining for slit skin smear and hair and nail microscopy are done in the laboratory in the skin OPD on regular basis. In addition autologous serum sensitivity testing and Wood's lamp examination is also done. Special dermatological investigation i.e. skin biopsies (punch, incisional and excisional), scalp biopsies and nail biopsies are regularly performed in the department on daily basis.

PHOTOTHERAPY:-

Department is integrated with Narrow Band Ultraviolet-B phototherapy whole body unit: This provides phototherapy for psoriasis, vitiligo, atopic dermatitis and other dermatological conditions.

PUVA-Sol is also provided to the patients.

DERMATOSURGICAL PROCEDURES

Department is incorporated with fully staffed and equipped minor operation theatre in which various dermatosurgical procedures are conducted on outpatient basis daily. Common dermatosurgical procedures done include electrosurgical procedures, radiofrequency ablation, chemical cautery, intralesional injections for keloids, hypertrophic scar and alopecia areata. Pairing, comedone extraction and needle extraction of molluscum contagiosum and milia are also done. Immunotherapy for warts is also provided to the patients. Special dermatosurgical procedures like microneedling, chemical peeling, cyst excision, partial and complete nail evulsion and punch grafting are also carried out. Newer treatment which are also available in the department include management of melasma and alopecia areata with microneedling and microneedling with topical application of autologous platelet rich plasma.

COSMETOLOGY SERVICES:-

Various aesthetic and cosmetology procedures are regularly done in the department which mainly include chemical peeling, dermaroller and other microneedling procedures, TCA CROSS and platelet rich plasma therapy.

INTEGRATED LASER UNIT :-

The dermatology department is fully integrated with the following LASER systems:-

1. Fractional CO2 Laser:- Fractional CO2 Laser is done for revision of grade-II and above acne scar , fractional skin resurfacing and striae distenasae.
2. DIODE Laser: Diode Laser is used for LASER hair reduction in patients of hirsuitism of the grade-II and above.
3. Q Switched Nd: YAG LASER: This is used for pigmented naevi, lentigines and tattoo removal .

LIBRARY:-

A good collection of latest books and journals of Dermatology, Venereology and Leprosy are available in the departmental and main library.

Undergraduates and postgraduate teaching of Dermatology, Venereology and Leprosy is also done in the outpatient and inpatient department.

DETIALS OF FACULTY

Sr.No.	Name of Consultant /Physician	OPD Days
1	Dr. Surbhi Dayal	All days
2	Dr Kamal Aggarwal	All days
3	Dr. Srabjit Kaur	All days

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DEPARTMENT OF SURGERY

Distribution of department into units: - 7 Units

B. **Details of faculty unit wise (given below)**:-

Unit	Consultants	Sr. Residents	Post Graduates	Year
I	Dr. Sanjay Marwah, Sr. Prof. Dr. Nityesha, Prof. Dr. RK Karwasra, Sr. Prof. Dr. Shailendra Kumar Singh, Asstt. Prof. Dr. Rajesh Kumar, Prof. Dr. Sanjeev Parshad, Prof. Dr. Mahipal, Asst. Prof.	Dr. Ravinder Dr. Luv Kumar	Dr. Kapil Kadyans Dr. Abhishek Mandal Dr. Amit Dr. Vikas Nehra Dr. Ishita Aggarwal Dr. Rohit Singh Dr. Shovik Das Dr. Monika Shekawat Dr. Anmol Galhotra	3rd Yr 2nd Yr 2nd Yr 1st Yr
VI	Dr. A.R Bansal, Prof. Dr. Ankit Bhardwaj, Asstt.	Dr. Manish Bansal	Dr. Gaurav Mittal Dr. Punit M. Dr. Amit Nehra Dr. Kapil Vats Dr. Mridul Gera Dr. Shaunak Mitra Dr. Shubham Kochar	3rd Yr 1st Yr
II	Dr. MS Griwan, Sr. Prof. Dr. Hans Raj Ranga, Prof. Dr. Naresh Pal, Assoc. Prof.	Dr. Ritesh	Dr. Vineet Dr. Udit Dr. Poonam Dr. Deechen Peden Dr. Amit Jangra Dr. Virender Kumar (HCMS) Dr. Parveen Kumar Panda Dr. Panmeshwar Kumar Rathia Dr. Madan Gopal Bhardwaj	3rd Yr 2nd Yr 1st Yr
III	Dr. Pradeep Garg, Sr. Prof. Dr. BK Arora, Prof. Dr. Surender Verma, Asstt. Prof.	Dr. Anil Mehta Dr. Md. T. Noori	Dr. Anuj Yadav Dr. Ankur Kajal Dr. Vivek Sirohi Dr. Vijay Pal Dr. Neha Garg Dr. Shivika Agarwal Dr. Aishwarya Pal	3rd Yr 2nd Yr 1st Yr
IV	Dr. MG Vashist, Sr. Prof. Dr. Manish Verma, Prof. Dr. Sunil Kumar, Asstt. Prof.	Dr. Parmal Kumar Dr. Sudhir Kumar	Dr. Sahil Dutta Dr. Naman Dr. Akshay Dr. Yajnadatta Sarangi Dr. Om Parkash Dr. Kanika Sachdeva Dr. Abhijit Kumar Singha Dr. Anil Kumar Kaushik	3rd Yr 2nd Yr 1st Yr

	Prof.		Dr. Argal Narottam Singh Dr. Vishal Chopra	2nd Yr
			Dr. Prabhjot Singh Ahluwalia Dr. Anil Kumar (HCMS)	1st Yr
VII	Dr. Satish Kumar, Prof Dr. Mahavir Singh, Assoc. Prof Dr. Meenu, Asstt. Prof.	Dr. Chetan Deswal Dr. Jitendra Singh	Dr. Baleswar Dr. Amiraj Singh	3rd Yr
			Dr. Sethu Raman PA Dr. Anoop Yadav	2nd Yr
			Dr. Vikas Yadav (HCMS) Dr. Vikash	1st Yr

. **Details of OPD/OT/Wards days Unit wise (given below)** :-

Units	Consultants	Emergency Days	OPD Days	OT Days	Ward days
I	Dr. RK Karwasra, Sr. Prof. Dr. Sanjeev Parshad, Professor Dr. Rajesh Kumar, Prof. Dr. Mahipal, Asst. Prof.	Monday	Monday / Thursday	Wednesday / Saturday	Tuesday / Friday
II	Dr. MS Griwan, Sr. Professor Dr. Hans Raj Ranga, Prof. Dr. Naresh Pal, Assoc. Prof.	Tuesday	Tuesday / Friday	Monday / Thursday	Wednesday / Saturday
III	Dr. Pradeep Garg, Sr. Prof. Dr. B.K Arora, Prof. Dr. Surender Verma, Asst. Prof.	Wednesday	Wednesday / Saturday	Friday / Tuesday	Monday / Thursday
IV	Dr. M.G. Vashist Sr. Prof. Dr. Manish Verma, Prof. Dr. Sunil Kumar, Asst. Prof.	Thursday	Thursday /Monday	Saturday / Wednesday	Tuesday / Friday
V	Dr. Sanjay Marwah Sr. Prof. Dr. Nityasha, Professor Dr. Shailendra Kumar Singh, Asst. Prof.	Friday	Friday / Tuesday	Thursday / Monday	Wednesday / Saturday
VI	Dr. A.R.Bansal. Professor Dr. Ankit Bhardwaj, Asst. Prof.	Saturday	Saturday / Wednesday	Tuesday / Friday	Monday / Thursday
VII	Dr. Satish Kumar,, Professor Dr. Mahavir Singh, Assoc. Prof. Dr. Meenu Beniwal, Asst. Prof.	Sunday	Wednesday / Saturday	Friday / Tuesday	Monday / Thursday

D. **Services provided by Department of Surgery.**

d. **Outdoor**:-

- Assessment of patients for diagnosis of surgical diseases attending surgical out door.
- Minor operative procedures which are possible without apparent risk of any intra operative complications are performed in Minor OT.
- Dressing of wounds is done in Minor OT.
- Teaching of Undergraduates and Postgraduates

e. **Indoor**:-

- Patients admitted for sake of conservative treatment are managed and monitored accordingly.
- Patients who are admitted for operations are prepared for surgery.
- Regular morning and evening rounds by various members of the team as per roster of unit.
- Opinions of different super-specialty are taken whenever necessary.
- Patients are referred to other specialities or Higher Centres for procedure/interventions if they are not available in this Hospital at that time.
- Minor procedures are carried out whenever necessary by Jr. Resident under supervision of Sr. Resident after proper consent.

- Discharge of patient from ward is decided after the round of Sr. Resident /Consultant.

f. **Operation Theatre**:-

- Patients are subjected to wide variety of general surgical procedures including Laparoscopic surgery.

g. **Emergency**:-

- All the general surgical emergencies including Trauma are managed round the clock.
- Resuscitation of Trauma victim is carried out as per ATLS guidelines.
- Operations (major and minor) are performed wherever necessary in trauma centre or emergency operation theatre by senior resident on emergency duty under the supervision of consultant on call.

e. **Special Clinic**:-

- Venous disease clinic - Monday/ Thursday.

f. **SOP followed in OPD** :-

e. In OPD, the patients are seen by resident doctors and consultants. If resident doctors have some difficulty regarding a particular case, they consult the Sr. Residents or the consultant depending upon level of difficulty.
f. Patients requiring surgery are sent for Pre-Anaesthetic check up.
g. Date of admission is given by Sr. Resident in charge admission / discharge after Pre-Anaesthetic clearance.
h. The admission is done by Sr. Resident in charge admission / discharge from the admission list which has been dated for that particular day and at random also after discussion with the consultant whenever required.
i. The admission in emergency is done on advice of Sr. Resident on emergency duty.
j. Discharge of a patient from emergency is decided by SR and whenever he needs any help of consultant, it is provided.

E. **Duties of consultant, Sr. Resident & Jr. Resident** :-

3. **Duties of Consultants**:-

- Provide consultation with regard to patient care in OPD, Indoor, O.T & Emergency.
- Medical boards.
- Do VIP duties for President of India, Prime Minister of India & other dignitaries.
- Do Undergraduate and Postgraduate teaching, guide PG thesis and administrative works assigned by Head of the Unit / HOD / Medical Superintendent / Director / University Administration.
- Academic works pertaining to National Board of Examination.
- Assessment work as allotted by Board of Governors in supersession of MCI from time to time.
- Conducting exams of Undergraduate/Postgraduate at PGIMS Rohtak and outside Institutions.
- Attending conferences at various levels and presenting papers/ delivering lectures/ oration etc.
- Outside expert for interviews by various organization.

4. **Duties Sr. Residents**: -Work under supervision of consultants for patient care.
-Attending conferences at various levels and involved in teaching of Undergraduates & Postgraduates.
- Supervise completion & timely deposition of all clinical case sheets.

5. **Duties of Jr. Residents**: - Work under supervision of Senior Residents & consultants for patient care.

- Attending conferences at various levels.
- Completion and timely deposition of all clinical case sheets.

F. **Responsibility of Emergency care, elective care including emergency operation & elective surgeries.**

3. **Emergency care**:-

a) Emergency patient care is done by various surgical units on rotation basis. Sr. Residents & Jr. Residents of particular unit on emergency duty are responsible for executing patient care in emergency under supervision of Assistant/Associate/Professor/Sr. Professor of that unit on emergency duty.

b) Patients of polytrauma including Craniocerebral Trauma, Burn & Plastic Surgery, Urology, CTVS & Paediatric Surgery & Orthopaedics cases (polytrauma) are all admitted in General Surgery & treated as per the advice of respective superspecialist. These superspecialists see such patients from time to time later also.

2. **Medicolegal work**: - All medicolegal work is done by Junior Resident & Senior Resident on emergency duty on a particular day.

3. **Emergency operations**: - They are done by Sr. Residents assisted by Jr. Residents of particular unit on emergency duty under supervision of Assistant/Associate/Professor/Sr. Professor of that unit.

4. **Elective care**:- Consultants with a team of Sr. & Jr. Residents carry out elective care.

5. **Elective Surgeries**:-The operation lists are prepared by Head of the unit in consultation with other consultants of unit. The consultant of a particular operation table is fully responsible for all the cases on his table for the surgery or postponement of the cases listed for surgery.

G. **Teaching program**-

1. UG: - The schedule regarding Undergraduate teaching is prepared by Dean's office and executed by various surgical units under supervision of Head of the deptt. and Head of the units as per roster prepared by Head of units. For attendance and teaching, the concerned consultant who has taken the class is responsible.
2. For Practical demonstration classes U.G students go to the concerned unit as per roster circulated by the HOD and demonstration classes are taken by the concerned unit as per teaching roster of that unit.
3. PG: - The schedule of Postgraduate teaching of the department is prepared by one Sr. Professor I/c PG teaching in consultation with Head of the deptt. Thesis projects are prepared by concerned candidate under the guidance of PG teacher within a fixed time frame. All such projects are discussed at various forums approved by Academic Council of the University.

H. **Details of Hospital round by faculty:** - The roster of ward rounds and trauma centre are prepared by respective Head of the units. A copy of this is sent to the office of Director, Medical Superintendent & Prof. I/c Trauma Centre.

I. Any other information / service provided by the department – Nil

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DEPARTMENT OF SPORTS MEDICINE

Following services are being provided by Sports Medicine Department at PGIMS, Rohtak

a) OUT-PATIENT DEPARTMENT (OPD):- OPD is being run on Tuesday & Friday of the week. A team of doctors treat a variety of patients especially Sports players with traumatic soft tissue and bony injuries, repetitive microtrauma disorders & non-traumatic conditions like arthritis and backache.

At OPD we have Plaster Clinic where plasters are being applied for fractures or other soft tissue injuries by doctors assisted by plaster technicians.

At OPD, we also have Minor OT where simple operative procedures like I & D(Incision & Drainage), excision of soft tissue swellings, Intraarticular/Intraleisonal injections are performed under sterile conditions.

b) SPORTS PHYSIOTHERAPY:- This section is dedicated to provide all the conservative and rehabilitative care to the OPD patients and the IPD patients. A variety of services like SWD (Short-wave Diathermy), Ultrasonic Massage, Wax Bath, IFT (Interferrential Therapy), LASER, ILT (Intermittent Lumbar Traction), ICT (Intermittent Cervical Traction), Spinal Stretching exercises, shoulder-wheel exercise, Theraband & weight training exercises, Balance, proprioceptive & plyometeric exercises for rehabilitation of post-operative patients & rehabilitation & performance enhancement of all athletes and persons involved in sporting activities.

c) SPORTS PSYCHOLOGY:- This section caters with teaching mental skill to enhance sporting performance by improving confidence & attention in Sport persons. Department also deals with Psychological rehabilitation of post-operative patients to decrease their pain perception and stress and boost their confidence for early return to day to day as well as sporting activities.

d) SPORTS NURTITION:- This section deals with diet/nutrition to the athletes/OPD & IPD patients for performances enhancement & recovery post exercise as well as during post-operative period . Specialized nutrition programmes are being provided to boost training gains, strengthen immune function & increase rate of recovery.

e) IN-PATIENT DEPARTMENT (IPD/WARD):- It is home to the admitted patients from OPD. Patients here are looked after with morning-evening rounds and round-the-clock nursing care. The ward is accompanied with a Minor OT where simply operative procedures like corticosteroid injections can be done under sterile conditions. Lab Technician in ward do the basic lab investigation for admitted patients.

OPERATION THEATRE:- The OT complex is well equipped with state-of-the-art machines technology. Patient of all kind especially ligament & soft tissue injuries and other derangements of musculoskeletal system are being operated upon by expert surgeons under all aseptic conditions to reproduce best outcomes.

Sr. No.	Name of Consultant OPD Days	OPD Days
1	Dr. Rajesh Rohilla	Tuesday & Friday
2	Dr. Mohit Dua	Tuesday & Friday
3	Dr. Mohit Khanna	Tuesday & Friday
4	Dr. Sushmita	Tuesday & Friday

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DEPARTMENT OF DHANWANTRI APEX TRAUMA CARE CENTER

A. Distribution of department unit wise.
There is no unit in the DATC only operational areas as sent in SOP vide letter no. Trauma/20/347 dated 4.3.2020.

B. Detail of faculty unit wise :-
Faculty is posted by different department working in DATC on rotation basis.

C. Detail of OPD/OT/Ward days unit wise.
Trauma OPD 24 × 7 Trauma OT 24 × 7 and ward for short stay for day care that also functions according to the units of departments.

D. Services provided by the department including Special Clinics and SOP's followed in OPD consultation, admission, treatment and discharge of patients run by the department with days.
General SOP's of DATC have been sent & special SOP's of department will be sent by respective departments.

E. Duties of consultant, Senior Residents and Junior Residents.
Will be provided by individual departments.

F. Responsibility of emergenct care and elective care including emergency operations and elective surgeries.
Individual department will send the SOP except for triage area which are already sent vide letter no. Trauma/20/347 dated 4.3.2020

G. Detail of UG and PG teaching programme.
No separate teaching programme in DATC.

H. Detail of hospital rounds by the faculty.
As per protocols followed by the department concerned.

I. Any other information/service provided by the department.
24 × 7 Trauma services along with facilities of lab and Radiology are available.

Dhanwantri Apex Trauma Centre is newly commissioned level-I Trauma Centre of Haryana state which provides services to the patients of Haryana as well as the neighbouring states. The Trauma Centre has total constructed area of around 19600 sq. Meters and has total 120 patient beds including 21 Intensive Care Beds and 45 indoor beds. All the beds have facility of central Oxygen supply and Suction through the In-house Gas Manifold Room. In addition the center has 05 major Operation Theatres with in-house CSSD facilities. Trauma Centre has in-house Radiology Department which provide 24x7 services of digital X-ray, Portable X-ray, Ultrasound, 3T MRI & CT. Trauma Centre has latest laboratory facilities which is being managed by Bio-Chemistry, Pathology and Microbiology Departments. The Bio-Chemistry Deptt. is providing the facility of BGA, KFT, LFT and ELECTROLYTE. Pathology Department is providing the facilities of all haematological investigation and Coagulation profile. The Microbiology Department is providing the facilities of urine C/E, all type of culture and viral marker (HIV, HBs AG, HCV). On an average around 300 patients per day are being treated at Trauma Centre. The Trauma Centre has in-house blood storage facilities which provide blood to patients immediately. The Trauma Centre provides comprehensive care to poly trauma patients under one roof by the dedicated team of doctors and paramedical staff. There are facilities of seven lifts, one ramp and four stair case. There is separate entry for the indoor patients as well as their relatives via separate lift and stair

case. There is dedicated parking area for the staff, public, ambulances. Trauma Centre is independent state of the art set up. The Trauma Centre has centralized Air Conditioning facility.

The following facilities are available at Trauma Centre

Ground Floor

- Triage Area
- Observation Area
- Minor OT
- GDMO Room
- DMS Office
- Plaster Room
- Radiology Department
- Gas Manifold
- Doctor duty Room
- Male & Female
- Attendants Waiting Area

- **First Floor**

OT &ICU complex, CSSD

- **Second Floor**

Admin Block, Blood Bank,

Labs and Seminar Room

- **Third Floor**

Admission Ward

All patients reporting at Trauma Center are registered after a quick preliminary assessment of the medico-legal status and severity and urgency of their ailment by the General Duty Medical Officer. Medico Legal formalities are taken care by GDMO. This is an important and sensitive point, and clerical work involving registration etc. never take priority over the provision of urgent attention to severely injured patients. A Trauma Registration card is then generated including demographic data like name, age, sex, address, date and time of arrival and a Trauma registration number is allotted and provisional diagnosis is clearly mentioned over it. The patients are allotted to the Red, Green and Yellow Triage are depending upon their clinical condition. The brief of the SOP followed in different triage areas are as follows:-

The team of the Red area is as under

- GDMO (Team Leader)
- SR Surgery/3rd year JR Surgery
- SR Orthopaedics/3rd year JR Orthopaedics
- JR Anaesthesia
- Intern/House Surgeon
- Two staff nurses
- Two ward boys

PATIENTS REFERRED IN RED AREA

- All unconscious patients (GCS<13)
- Patient with unstable hemodynamic
- Systolic BP<90
- RR>25
- Oxygen saturation<90
- Patients with open bleeding
- Gunshot injuries
- Stab injuries-abdomen and chest

SOPs FOLLOWED IN PATIENT MANAGEMENT IN RED AREA

- Resuscitation as per ATLS protocol
- Activate plan
- Secure IV LINE
- Collect blood for cross match and blood investigations
- X-ray and CT Scan/USG once stabilized
- In unstable patients-X-ray and USG should be done bedside
- For CT Scan patient should be shifted along with one staff nurse.
- Before shifting the patients the staff nurse will inform the radiology department and accordingly the CT machine will be kept ready for that patient.
- Report/provisional report of CT Scan should be handed to the doctor or staff nurse
- Depending upon the investigations patient should be shifted to OT/ICU/Ward.
- All events should be recorded in the file along with time.
- Staff nurse will hand over the patient to other duty staff nurse.
- Receiving staff nurse will record the vitals at the time of receiving the patients.
- On duty staff nurse will inform the staff nurse of emergency OT/ICU in case patient has to be operated/shifted to ICU.
- Team of OT/ICU will be ready for receiving the patients.
- Important Time to be recoded
    - ⁕ Time from receiving to CT scan
    - ⁕ Time from CT scan to OT/ICU

YELLOW TRIAGE AREA

- Isolated limb injuries
- Abdominal peritonitis
- Mild head injuries (GCS-13-15)
- TEAM
    - ⁕ Surgery and Orthopaedics resident
    - ⁕ Dental resident
    - ⁕ Staff nurse

GREEN TRIAGE AREA

- ⁕ Walking patients
- ⁕ Stable vitals
- ⁕ No active bleeding
- ⁕ Renal/Ureteric Colic
- ⁕ Observation and Discharge
- ⁕ TEAM
    - Staff nurse reporting to Team of Yellow area + GDMO

CLARIFICATION REGARDING PATIENT CARE RESPONSIBILITES IN THE TRAUMA CARE CENTRE.

There could be occasions when there is a controversy regarding the unit, departments or discipline to which a patient belongs. The patient may be sick enough to deserve admission but the different department/units may not be agreeing as to who would have the primary responsibility of such a patient. Most

of such situations arise in patients with multi-disciplinary problem, General guide-lines for such patients are given below. But as a standing hospital rule, in all such situations, the opinion of the General Duty Medical Officer is final.

MULTIPLE INJURIES

1. In patients with injuries involving abdomen, chest and head, the general surgical unit on-call would take the primary responsibility of the patient care. The management is carried out in consultation with other concerned departments/units.
2. On the other hand, injuries involving head, neck, chest, pelvis or extremities, the patient will be admitted under the specialty according to organ-system being mainly affected in the accident, would take the primary responsibility of the patient.

As a rule, a patient with altered sensorium due to head injury will be admitted under General Surgery though she/he may be having other system injuries. Patient with isolated limb injury will be admitted in the Orthopedics Department while patient with isolated dental injury will be admitted in Dental Ward.

- Red area patients will be given the priority for CT Scan, USG, X-Ray, OT and ICU
- All burn patients will be resuscitated in the separate cabin in red area and after stabilization shifted in the surgical ward immediately

- For any super specialty assistance duty SR/JR will call and record in the file along with time
- The SR super specialty or consultant will attend the call on urgent basis and document notes in the file along with time.
- All the patients will be admitted with the name of duty unit/consultants and in case of any proceeding/query the duty unit incharge/consultant will be answerable in respective departments.

DEATH PROTOCOL FOR PATIENTS EXPIRED IN TRAUMA CENTER

- Resident of the respective department will shift the patient to mortuary after following the due legal process.
- Nursing Sister of ward/Triage/ICU to provide
- No dead body will be kept in Trauma Center for more than 1 hour.
- Consultant incharge will be responsible regarding any lapse.

SOP's FOR BROUGHT DEAD PATIENTS

- Brought dead patients will be shifted in the mortuary after following the due Medico-legal process by GDMO.
- Nursing incharge Triage Area will assist/coordinate

General SOP's for making availability of functioning of equipment and drugs in DATC :

1. ANS Trauma Center would raise the annual demand for procurement of drugs and consumables to be used in different areas of DATC through consultation with Nursing Sister's of various areas under supervision of Nodal Officers of concerned departments like General Surgery, Orthopaedics, Neurosurgery, Burn and Plastic Surgery, Anaesthesia (TICU, TCOT), Eye, ENT, CTVS, Pediatric Surgery, Urology & other sporting areas like radiology, labs and blood bank.
2. Nodal Officers can through their HOD's take notice of their respective areas and bring to his notice with information to Incharge DATC for redressal.
3. DMS I/c DATC will ensure work of GDMO's, duty roster's of House Surgeons, Intern and other staff in DATC.
4. DMS I/c DATC will also ensure supply of drugs, security, CCTV monitoring, and MLC work alongwith crowd management.
5. Incharge DATC will coordinate and communicate to the Authorities of any issue of shortcomings noticed from time to time after getting feedback from Nodal Officer's/ DMS Incharge /ANS DATC.
6. Incharge DATC will also look into the complaints/suggestions.
7. Overall administrative control rests with the Authorities in order of Medical Superintendent, PGIMS and Director, PGIMS.

Special Note :

These SOP's are to facilitate the work of DATC and to provide best possible services to patients coming to Trauma Care Center. There is always scope of improvement. Any suggestion and amendments are welcome can be included in this profile.

These are general SOP's for DATC. However each department working in DATC will submit its SOP's through Nodal Officer with copy to Incharge DATC.

STANDARD OPERATING PROCEDURES (SOPs) – TRAUMA CENTRE, DEPARTMENT OF ORTHOPAEDICS PT.B.D.SHARMA, PGIMS,ROHTAK

Unit on Duty according to days:-

Monday	–	I
Tuesday / Friday	–	II
Wednesday / Saturday	–	III
Thrusday	–	IV
Sunday	–	I/IV (Alternate)

- ❖ Patient is admitted / seen by the specific unit residents on duty and primary care is provided.
- ❖ Respective intervention is done as per the requirement of care of each patient.
- ❖ Patient required to be operated / need for observations are admitted under the specific unit on duty and after getting PAC clearance from anaesthesia department (Trauma OT Anaesthesia Team). Patient is taken up for surgical intervention.
- ❖ Patients are transferred to trauma centre ward after surgery is done or for observation and kept there till discharge are kept in trauma ward til the necessary surgical intervention is done.
- ❖ Patient of poly trauma / requiring ICU care are shifted to trauma ward and kept under observation / ICU if required after consulting the trauma ICU team.

- Patient are discharged from the trauma centre if no further intervention is required and all the necessary care has been provided.
- Patient who are not fit for surgery and may required multi departmental intervention / work up before surgery are shifted to ward 12 or 26 after due stabilization.
- Patient after being shifted to ward 12or26 are then managed in the ward after all necessary intervention has been done and patient is fit for discharge.
- Patient after being discharged from DATC and ward 12/26 after further followed up in OPD on the specific days of every unit to which the patient was admitted.
- Factilites at Trauma Centre

  Minor OT & Plaster Room
  Beds in Emergency Room 4 -12
  Beds in Trauma Ward – 15 + 5 Misc
  Trauma OT – 02 tables with one C-Arm

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DEPARTMENT OF UROLOGY

The Urology Department of PGIMS Rohtak, provides a whole range of comprehensive and efficient services for the management of urological problems.

The Urology Department of this institute is functional since a decade and got permission to start MCh. Degree course in 2012. Every year it takes one resident for MCh. Urology training through national level entrance exam.

With our complete range of facilities, the Centre performs minimally invasive procedures such as laparoscopic urological procedures, endourological procedures like TURP,TURBT, PCNL, URS, OIU, Cystolitholapexy, extracorporeal shockwave lithotripsy for treatment of urinary stones, transrectal ultrasound and biopsy of the prostate and urodynamics study of the urinary tract.

The department also performs complex surgical procedures such as Intra Renal Surgery, Nephron-sparing Surgery for Renal Cell Carcinoma and Nephrolithotomy exploiting hypothermia and regional vascular control, sophisticated procedures of urinary incontinence and different types of urethroplasty procedures. Ablative & Reconstructive Lap urology also being done here. It specialises in Radical Cancer Surgeries such as radical nephrectomy, radical cystectomy, radical prostatectomy, radical penectomy, radical orchidectomy and retro peritoneal lymphadenectomy. Different types of complex urinary diversions including ilealpouches are also performed here.

The Urology Department is staffed by Urologists with a broad range of experience in the fields of endourology, laser surgery, laparoscopic surgery, uro-oncology, female urology, andrology and reconstructive urology.

Faculty

1. Dr. Devendra S. Pawar
   Sr. Professor & HOD
   M.B.B.S, M.S., M.Ch. (Urology)

2. Dr. Hemant Kamal
   Professor Surgery, Consultant Urology
   M.B.B.S., M.S., M.Ch. (Urology)

3. Dr. V.S.Rathee
   Teacher
   M.B.B.S., M.S., M.Ch. (Urology)

Sr. No.	Name of Consultant/Physician	OPD Days
1	Dr. Devendra S. Pawar	Tuesday, Thursday & Saturday
2	Dr. Hemant Kamal	Tuesday, Thursday & Saturday
3	Dr. V.S.Rathee	Tuesday & Thursday

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DEPARTMENT OF VISHRAM SADAN

The foundation stone of Vishram Sadan was laid down in 1986 and it was inaugurated in year 1990. The Vishram Sadan has three floors:-

1. **First Floor: -** It has five rooms with six beds in one room. One room is allotted to Jan Sewa Sansthan (Regd.) and another is allotted to Hari Om Sewa Dal (Regd.) in which disabled patients are kept by these NGO's. On the other hand, this floor has four other rooms with two beds in which kitchen and bathroom are attached. Three bathrooms are for general room patients.
2. **Second Floor: -** This floor has eight general rooms with six beds in each and four special rooms of two beds with kitchen and bathroom attached. Three bathrooms are for general rooms.
3. **Third Floor: -** This floor has eight general rooms with six beds each in one room and four special rooms of two beds each with kitchen and bathroom attached. Three bathrooms are for general rooms.

Floors	**Special room with two beds each kitchen and bathroom attached**	**General Rooms with six beds each**	**General Bathrooms**
First	Four	Five	Three
Second	Four	Eight	Three
Third	Four	Eight	Three

The patients and their attendants visiting to the institute for treatment are provided beds or rooms in the Vishram Sadan with the permission of Casualty Medical Officer (A & E) on the prescribed form. The rent for one bed in general room is Rs. 5/- and rent of special room is Rs. 30/- per day from 8:00 AM to 8:00 AM (next day)

Services:-

The beds are provided with mattress and bed sheets and in winters blankets are also given. All rooms have ceiling fans. Facility of water coolers (for cold water) and hot water is also provided in the Vishram Sadan.