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AMENDMENT/REVISION SHEET

Sr. No.	Page No.	Date of Revision	Description of Revision	Signature of HOD	Signature of Dean

DR VITTHALRAO VIKHE-PATIL FOUNDATION'S MEDICAL COLLEGE AND HOSPITAL, VADGAON GUPTA, POST- MIDC, AHMEDNAGAR

DEPARTMENT OF MEDICINE

STANDARD OPERATING PROCEDURE

INTRODUCTION

The Department of Medicine at Dr. Vitthalrao Vikhe-Patil Foundation's (DVVPF's) Medical College and Hospital, (also informally known as Vikhe-Patil Institute of Medical Sciences (VIMS), Vadgaon Gupta, Post- MIDC, Ahmednagar (Maharashtra) is the largest department of college in terms of workload. The department is not only providing outstanding basic medical care in the field of medicine but also is productive in its scientific contributions. The faculty has helped to establish the role of physicians as consultants and teachers in fields such as Internal Medicine, Intensive Care, Critical Care, Geriatrics, Neurology, Cardiology, Gastroenterology, Pulmonology, Hematology, Rheumatology, Nephrology, Oncology and endocrinology particularly diabetes and thyroid disorders. Specialty OPDs are regularly conducted by qualified faculties. The department runs MBBS and MD courses/ and has a strong background of research and publications.

This SOP pertains to functioning of the department of medicine. Other SOPs concerning the various wards and procedures usually performed in the department are attached as appendices. The SOPs will be updated from time to time as and when treatment protocols are revised or otherwise required.

Appendix 'A'- SOP for management of Medical ICU

Appendix 'B'- SOP for Oxygen Therapy

Appendix 'C'- SOP for Defibrillation and Cardioversion

Appendix 'D'- SOP for Endotracheal Intubation

Appendix 'E'- SOP for Mechanical Ventilation

Appendix 'F'- SOP for Central Line Placement

Appendix 'G'- SOP for Acute Chest Pain

Appendix 'H'- SOP for management Acute Severe Asthma

Appendix 'I'- SOP for management of Comatose Patient

Appendix 'J'- SOP for management of Poisoning

Appendix 'K'- SOP for management of Poisonous Snake Bite

Appendix 'L'- SOP for management of Status Epilepticus

VISION

- To strive for perfection and become centre of excellence by setting the standards in medical education, patient care and clinical research and bring the institute to the international standards of medical education and research.

- To create an academic atmosphere conducive for assimilation of knowledge, inculcate a sense of compassion and empathy for human suffering and promote full realisation of latent potential, hidden talents and eventual self-actualisation of all those who learn, train and serve here.

MISSION

- Achieve excellence in the specialized field of medicine, critical care medicine.
- To be strong, efficient, dedicated and well-organized support of the entire medicine fraternity.
- To train the undergraduate and postgraduate students in the basics of medicine care and emergency life support.
- To enable students to inculcate analytical, practical and communication skills.
- To impart knowledge of research methodology and scientific temper for the advancement of the specialty.
- To inspire the faculty staff for updating their knowledge and research skill.
- To facilitate achieving the institutional goal of producing a competent physician with requisite practical skills and knowledge of medicine to safely practice anywhere in the world.

SCOPE OF SERVICES

- Intensive Care
- Critical Care
- Neurology
- Cardiology

- Diabetes, Thyroid and other endocrinology disorders
- Gastroenterology
- Oncology
- Hematology
- Nephrology
- Pulmonology
- Respiratory
- Rheumatology
- Geriatric and
- OPD and Emergency Services

ROLE OF THE DEPARTMENT OF MEDICINE:

The Clinical duties are governed by various Acts, Rules and Laws amended and enacted by the central, state government and local bodies, Medical council of India and the institution to name a few.

  - Indian Medical Council Act 1956 and amendments.
  - Code of Medical Ethics 2002.
  - Consumer Protection Act 1986.
  - Biomedical waste (Management Handling) Rules 1998 under Environ Protection act 1986.
  - Transplantation of Human Organs Act 1994
  - Medical Termination of Pregnancy Act 2003
  - Prenatal Diagnostic Technics Act 1994.
  - Drugs and cosmetics Act 1940.

- All faculty, residents and staff of the department must be acquainted with relevant laws, rules and regulations to be able to discharge their duties efficiently.

- To provide medical care to patients visiting medical outpatient department (MOPD), and also medical treatment for patients in casualty and other departments.
- To provide comprehensive medical care to the indoor patients in wards and Intensive care units for critical patients.
- To impart treatment for infectious disease, cardiovascular, respiratory, neurology, gastroenterology, musculoskeletal disorders, hematology, nephrology and oncology patients.
- To provide medical referral services for all departments and fitness for patients undergoing surgery.
- To coordinate with the super-specialties such as cardiology, nephrology and neurology.
- To conduct various specialty medical camps attended by faculties and residents - like geriatrics, diabetes, respiratory and cardiovascular disease.
- Resident doctors regularly attend the rural health centers as a part of the social outreach program organized by Dr Vikhe-Patil Medical College & Hospital.

INFRASTRUCTURE OF THE DEPARTMENT

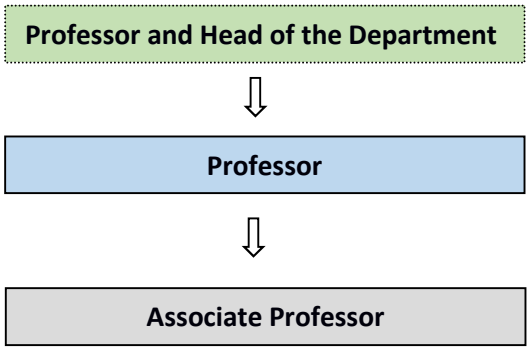
- **The Medicine department** of VIMS is situated in the main hospital building on the ground floor and includes
  - Faculty offices,
  - Departmental Office,
  - Residents room,
  - Seminar room
  - Demonstration room
  - Departmental Museum
  - Departmental library.
  - TMT room

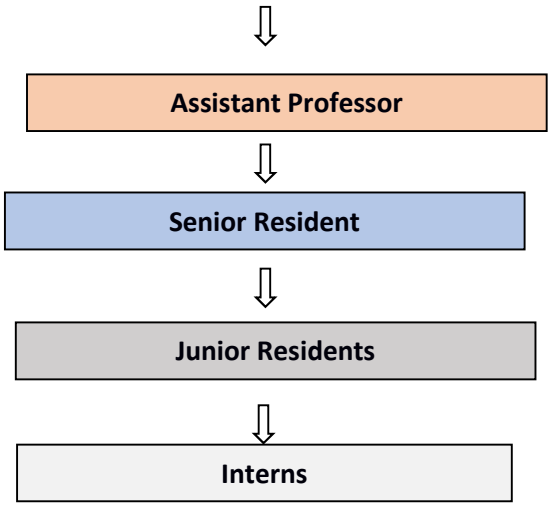
- PFT room,
- EEG room
- Departmental Research room
- Store room

- **Outpatient Services:**
  - Central reception,
  - Four OPD cabins,
  - ECG room,
  - Injection rooms (separate for males, females)

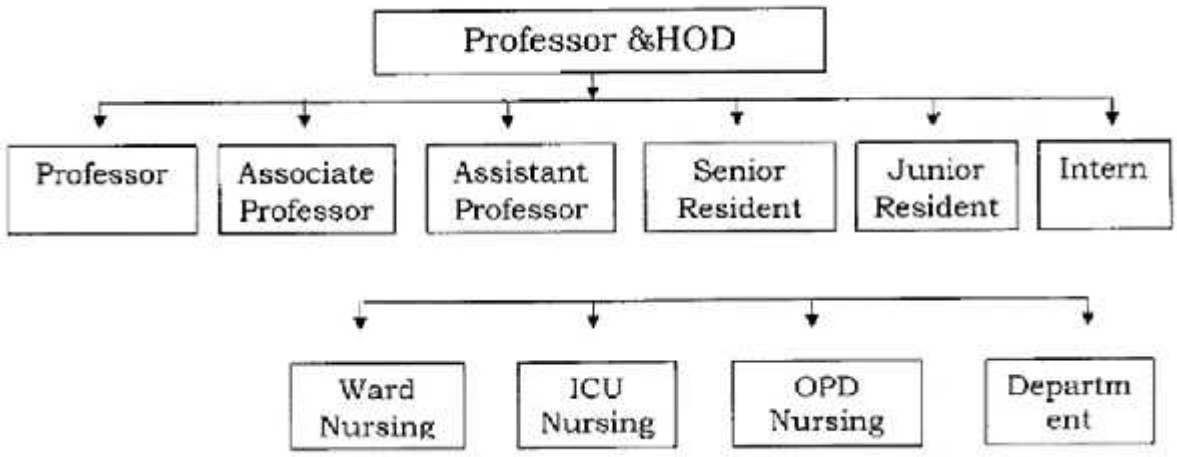
- **INPATIENT SERVICES**
- **Total Beds**:
  - 150 beds,
  - 14 ICU Beds,
  - Six RICU beds
  - Ten dialysis beds

ORGANOGRAM





ORGANISATION PATTERN



DUTIES AND RESPONSIBILITIES

RESPONSIBILITIES AND DUTIES OF PROFESSOR AND HOD

- To perform duties given under statutory provisions of Medical Council of India, Maharashtra Medical Council, Maharashtra University of Health Sciences and Dr. Vitthalrao Vikhe-Patil Foundation (DVVPF).

- To ensure implementation of various rules, acts and laws related to Medical Education and Hospital services Acts related to various allied specialties, enacted by Government of India and State Government for the purpose of conducting various Medical Undergraduate, Postgraduate and Paramedical courses.

- To maintain and continually improve the standards of patient care, hospital services, medical education and research with reference to NAAC, NABH, ICI and other accreditation authorities.

- To implement policies laid down from time to time in order to work towards achieving the vision and mission of the Institution and the department

- Strive to keep up and improve on the reputation of the institution as a center of excellence in the field of patient care, medical education, training and research.

- To maintain disciplined, ethical, humane and courteous culture in the and around department.

Academic Activities/ Responsibilities

Administrative and supervisory duties:

- To perform all such duties under statutory provision of various acts laid down by the University which, govern the services of the staff working in the department. This also includes laws, acts and rules applicable and adapted by the university.

- Prepare annual budget for the department timely for smooth running of the department.

- Establishment of matters like control over staff of the department by:

    - Distribution of duties and responsibilities Administrative, Academics, Clinical and outreach

    - Discipline, Regularity and punctuality by maintaining muster roll, movement registers etc.

    - Ensure smooth functioning of the department during leaves of the staff members and vacations etc.

    - Proposals for promotion - Monitor academic and clinical performance of staff periodically and encourage them to improve and update themselves so as to achieve excellence.

- To serve memorandum and call for explanations from undisciplined, irregular, irresponsible, erring staff and propose suitable action against them.
- Initiate the annual performance appraisals of staff.

- To achieve desired levels of academic performance by helping to organize, distribute, monitor, punctuate and also perform academic activities like
  - Conducting Graduate and Post-Graduate teaching & training activities as per schedule in collaboration with Heads of the Units (HOU),
  - Bed side clinical teaching,
  - Conducting Tutorials, Periodic tests and examinations,
  - Inter-disciplinary teaching,
  - Instructions programs for slow learners,
- Conducting University examinations - Theory and Practical
- To work as Paper setter, Moderator, examiner, CAP evaluator etc,
- To work as postgraduate guide for PG students,
- To allot teachers and dissertation subjects to the PG students admitted in the department. To facilitate, punctuate and periodically assess the work of the PG students allotted to him/her and see that the desired targets are achieved in time.
- To ensure conduct of postgraduate teaching and training activities as per schedule,
- To prepare a time bound teaching and training schedule with aim of building clinical competence and strive to achieve desired objective in time for PGs in his unit,
- To evaluate the progress of post-graduation students,
- Ensure regularity, punctuality and discipline amongst PG residents. Imbibe work culture, good bed side manners, cordial inter personal relations amongst them,
- Make PG residents conversant with communication skills and counseling procedures.
  - To ensure that the postgraduate (PG) students do not exceed the limits of their clinical competence but seek timely guidance from the seniors,
  - Encourage students to participate in conference, extracurricular activities, at college, university & higher levels,

- Guiding & helping faculty to develop teaching skills by allotting theory classes and clinical teachings under supervision of seniors.
- Identifying weak areas of faculty in teaching, learning, research, clinical skills etc. and overcoming the problems by suitable counseling and guidance.
- Ensuring availability of optimal facilities so as to achieve and improvise clinical skills.

- Monitoring performance (Academic & clinical) of faculty & apprising them about the areas that need improvement. Helping and guiding them bring about desired change.
- To identify the aptitude, competencies and special interests of the faculty and give them suitable job responsibilities or value additions to their regular duties.
- To organize core competency development program.
- To prepare and pursue proposals for qualitative upgradation of the unit, department and the institution at large.
- To identify potential talents amongst staff and encourage them to achieve better and newer, skills through in service training, fellow ships, refresher courses through institutional resources whenever possible.
- Help faculty to achieve desired levels of performance by upgrading & updating departmental library.
- Ensure availability of medical equipment that is in good working condition. Ensure timely procurement of new equipment. Strive to fill up gaps between MCI recommendations and available equipment and instruments.
- Ensure availability of optimal facilities so as to achieve and improve clinical skills.
- Ensure maximum faculty is exposed to medical education training (MET) program.
- Monitor performance (academic & clinical) of faculty and apprise them about the areas that need improvement. Help and guide them bring about desired change. HOD depending on his judicious opinion should recommend incentives and disincentives for the faculty in his department
- Prepare a disaster management plan of his department which will be a part of the institutional plan, update it and run mock drills periodically.
- To work on college council and other committees (academic, clinical, administrative) as required by the institution.

- To organize guest lectures, live workshops by renowned professionals and also participates in such activities in other institutions.

- To ensure research work, publications, participation in conferences, workshops, seminars etc. at Institutional, State, National and International levels and encourage and persuade the faculty to do the same.

- Be vigilant about ragging, gender harassment and welfare of physically handicapped staff and students.

- To ensure appropriate arrangement for smooth functioning of the department while proceeding on temporary duty, leave or any kind or vacation by making suitable arrangement.

Clinical Duties and Responsibilities:

The Clinical duties and responsibilities are as follows:

- Perform duties to ensure continuous improvement in quality of services to the patients through effective service delivery system.
    - To maintain medical records, investigation reports of patients in the department.
    - To suggest techniques and methods of management in order to upgrade quality of patient care.
    - To supervise work of his unit residents.
- Comprehensive Management of the units in the department so that the patients get proper treatment and advice and there is no medical negligence as a result of violation/infringement or breach of code of medical ethics.
- To oversee that the standard guidelines for prevention of hospital Associated Infection Control are practiced conscientiously in his department and to adopt containment measures when infections occur and put them on record and report to competent authorities.
- To help prepare policies and procedures for prevention of outbreaks of hospital acquired infection, biomedical waste management, biosafety measures, barrier nursing, isolation protocols and train his department staff, resident doctors and students on these issues.
- Decide on the departmental & institutional Admission, Management & Discharge Policy including referral protocols for his department and implement such policies strictly.

- He/she will take ward-rounds for the cases admitted under care of his unit and prepare a plan for management of the patient within 24 hours of admission. The plan may be upgraded, changed subsequently depending on report of investigations and patient's condition. The investigations done should justifiable and of diagnostic and prognostic value. The management plan must be known to all the members of treating team (including nurses).

- Patients and relatives should be explained about this plan and counseled accordingly. A written record of such counseling will always be maintained, particularly when patients condition is unstable or serious and there are major changes in treatment plan. The responsibility of such counseling will rest with a senior faculty.

- The HOD will ensure preparation of guidelines for uniformity in management of patients in various sections like casualty, ICU, wards and OPD. These should include matters like

    - Admission, discharge of referral procedures
    - Transfusion of blood and blood products,
    - Drug therapies,
    - Management of high-risk patients (critically ill, elderly, mentally or physically compromised cases, patients under restrains, sedation, anesthesia, patients undergoing invasive procedures)
    - CPR,
    - Use of ventilator, Oxygen therapy,
    - Usage of antibiotics, narcotics and
    - Nutritional therapy.

- To prepare the departmental protocol for observation of patients on high risk medications. This should include monitoring of accuracy of dosage of drugs, their dilutions where indicated, route and frequency of administration and undesired side effects observed.

- To ensure maintenance and updating all records of academic, research, clinical and administrative nature related to his unit.

- To ensure preparation of lists of vital, essential and desirable drugs for usage in the department, decide tentative quantities and monitor the uninterrupted availability of vital and essential drugs in all sections of the units in the department. Bring to the notice of the competent authority any shortage in the supply of any of these two categories of drugs.

- Any other Additional Duty/Responsibility Assigned by HOD, Institution, University and Management.

- Ensure complete and timely implementation of medico legal work and related records. He/she is duty bound to issue certificates and attend court when summoned.

- He/She should be readily available for duties on his/her emergency days, on any day for emergency call related to patients of his/her unit, of other unit when he/she is locum for the concerned faculty.

- He/ She should be readily available for duty in cases of disaster, Natural calamity and when the institution desires his services.

PROFESSOR/ASSOCIATE PROFESSOR AND HOU

- To perform duties given under statutory provisions of Medical Council of India, Maharashtra Medical Council, MUHS and VIMS.

- To abide by various rules, acts and laws related to medical Education and Hospital services Acts related to various specialties, enacted by State Government and Government of India for the purpose of conducting various Medical Undergraduates, Postgraduates and Paramedical courses.

- To maintain and continually improve the desired standards of Medical education, Research and Hospital services with reference to NAAC, NABH, ICI and other accreditation authorities. To perform all such duties under statutory provision of various acts laid down by MUHS which govern the services of the staff working in the department. This includes laws, acts and rules applicable and adapted by the University.

- To implement policies laid down from time to time in order to work towards achieving the Vision and Mission of the Department and the Institution.

- To strive to keep up and improve the reputation of the institution as a Centre of Excellence in the field of Medical Education, Research and Hospital services.

- To maintain well-organized, courteous, ethical, and benevolent culture in the unit, department and institution at large.

Academic Activities/ Responsibilities

- To Achieve desired levels of academic performance by

- To help HOD to organize, distribute, monitor, punctuate and also perform academic activities like conduct UG and PG teaching & training activities as per schedule in collaboration with HOD
- To conduct bedside clinical teaching
- Conducting Tutorials, Periodic tests and examinations.
- Inter-disciplinary teaching,
- Instructions programs for slow learners,
- To conducting local and MUHS examinations-Theory and practical
- To work as paper setter, Moderator etc.,
- Work as postgraduate guide for PG students,
- Allot dissertation subjects to be PG students allotted to him/her facilitate, punctuate and periodically assess his/her work and see that the desired targets are achieved in time,
- To prepare a time bound teaching and training schedule, build clinical competence and strive to achieve desired objectives in time for PG in the unit
- To evaluate the progress of PG students, under him/her.
- To ensure regularity, punctuality and discipline amongst PG residents, in his/her unit and to imbibe work culture, good bedside manners and cordial inter-personal relations amongst them
- Make PG residents conversant with communication skills and counseling procedures,
- To work as HOD when he is on leave/vacation/out of station for duty purpose.
- Arrange to teach PG students the various treatment protocols and be realistic in their decision making. They should no way exceed the limits of their clinical competence but seek timely guidance from the seniors,
- Conduct and encourage postdoctoral research,
- Encourage students to participate in extracurricular activities, at College, University & higher levels

- Guiding & helping faculty in the unit to develop teaching skills by allotting theory classes and clinical teachings under supervision of seniors.

- To identify weak areas of faculty in teaching, learning, research, clinical skills etc. and overcoming the problems by suitable counseling and guidance.

- Ensuring availability of optimal facilities so as to achieve and improvise clinical skills.

- To monitoring performance (Academic & clinical) of faculty & apprising them about the areas that need improvement. Helping and guiding them bring about desired change

- To establish control over staff of the unit-

    - Distribution of duties and responsibilities administrative, academics, clinical and outreach.

    - Discipline, regularity and punctuality by maintaining muster roll, movement register etc.

    - Regulate leave matters, vacations etc

    - Monitoring academic and clinical performance of staff from time to time and encourage them to improve and update themselves so as to achieve excellence.

    - To call explanations from indiscipline, irregular, irresponsible and erring staff and propose suitable action against them.

- To initiate, encourage, guide and help faculty in his/her unit in conducting research and publish research papers of high quality in journals of desired status. The research should try to be oriented to have academic and social impact.

- To identify the aptitude, competencies and special interests of the faculty and give them suitable job responsibilities or value additions to their regular duties. Organize core competency development program.

- To prepare and pursue proposal for qualitative upgradation of the unit, department and institution at large. This up-gradation may be academic, research or clinical facilities, outreach health-activities, achievable through change in physical infrastructure, up gradation in equipment,

- To identify potential talents amongst staff and encourage them to achieve better and newer skills through in-service training, fellow ships, refresher courses through institutional resources whenever possible.

- To help HOD in upgrading and updating departmental and central library

- To help assist the HOD purchase of new equipment and keeping existing equipment in good working condition by timely repairs and servicing.

- To organize guest lectures, live workshops by renewed professionals and also participates in such activities in other institutions.

- To carry out research work, produce publications, participate in conferences, workshops, seminars, symposia etc. at Institutional, State, National and International levels and encourage and persuade the faculty to do so.

- Be Vigilant about ragging, gender harassment and welfare of physically handicapped staff and students.

- While proceeding on leave of any kind or vacation after making a locum arrangement of permission from HOD & institution.

- The Clinical duties are governed by various Acts, Rules and Laws amended and enacted by the central, state government and local bodies, Medical council of India and the institution to name a few.

  The Clinical duties and responsibilities are as follows:

  - To perform duties to ensure continuous improvement in quality of services to the patients through effective service delivery system.

  - To maintain medical records, investigation reports of patients under his care in a legible and responsible manner.

  - To suggest techniques and methods of management in order to upgrade quality of patient care.

  - To supervise work of the unit residents.

    - Comprehensive Management of the units in the department so that the patients get proper treatment and advice and there is no medical negligence as a result of violation/infringement or breach of code of Medical Ethics.

    - To ensure that the medical profession and its dignity and reputation of the institution are not disgraced in the slightest. It is binding on a medical professional to attend in emergencies as and when required beyond the regular duty hours.

  - To ensure that the standard guidelines for prevention of hospital Associated Infection Control are practiced religiously in his department and unit, he should take containment measures when infections occur and put them on record and report to competent authorities.

- Should help to decide a policy and procedure on prevention of outbreaks of hospital acquired infections, Biomedical waste management, Biosafety measures, Barrier nursing isolation protocols and train the unit staff, resident doctors and students on these issues.

- To Follow the Departmental & Institutional Admission, Management & Discharge Policy including referral protocols for his department and implement such policies strictly. While doing so keep in mind that the patients' expectations match the resources available with the institution.

- To take ward-rounds for the cases admitted under care of his/her unit and prepare a plan for management of the patient within 24 hours of admission. The plan may be upgraded, changed subsequently depending on report of investigations and patient's condition.

- Patient and relatives should be explained about this plan and counseled accordingly. A written record of such counseling should always be maintained, more particularly when patient's condition is unstable or serious and there are major changes in treatment plan. The responsibility of such counseling should be fixed on a senior faculty.

    - To follow procedures and guidelines for uniformity in management of patients in various sections like casualty, ICUs wards and OPD. These should include matters like transfusion of blood and blood products, drug therapies, admission, and discharge of referral procedures, CPR, use of ventilator, Oxygen therapy, management of elderly, mentally or physically compromised cases, high risk patients, patients under restraints, sedation, anesthesia, pre and post-operative cases, patients undergoing invasive procedures, delivery cases, usage of antibiotics, narcotics and nutritional therapy, cases related to research work etc. As faculty he should give his inputs. The guidelines so prepared by the HOD should be adhered to at all times.

    - Follow the departmental protocol for observation of patients on high risk medications, post-operative and critical cases. This should include monitoring of accuracy of dosage of drugs, their dilutions where indicated, route and frequency of administration and undesired side effects observed.

    - To counsel the patient and relatives about such matters preferably in writing should be routine. There should be a mechanism to inform such cases to seniors in unit.

- Be responsible for maintenance and updating all records of academics, research, clinical and administrative nature related to his unit.

- To prepare lists of vital, essential and desirable drugs for usage in his department. Tentative quantities of these should be decided.

- To monitor the consistent availability of vital and essential drugs in all sections of his unit. Short supplies of any of these two categories of drugs should immediately be pointed out to competent authority.

- To carry out any other additional duty/responsibility assigned by head of the Department, Institution, MUHS and Management.

- To carry out the medico legal work and maintain related records. As medical professional, he/she is duty bound to issue certificates and attend court when summoned. Institution does not provide any substitute or immunity in case of failure to perform this duty.

- He/ She should readily available for duties on his emergency days, on any day for emergency cull related to patients of his unit, of other unit when he/she is locum for the concerned faculty.

- He/ She should be readily available for duty in cases of disaster, Natural calamity and when the institution desires his services.

ASSOCIATE PROFESSOR

Reports to Unit In-charge and Head of Department

- To perform duties given under statutory provisions of Medical Council of India and Maharashtra Medical Council, MUHS and VIMS.

- They will ensure efficient and comprehensive patient care for all patients put under the care of teaching units.

- They will ensure that all teaching tasks allotted to units are carried out efficiently.

- They will ensure that all members of his teaching unit take regular ward round and hold bedside clinics both in the wards and outpatient departments.

- They will assist the HOD in teaching, research and other duties.

- They will carry out any other duties allotted to them by the Head of the department.

- The senior Associate Professor will look after the general administration of the department which will include security and welfare of personnel, conferences and inspection of the department.

- The senior Associate Professor will also supervise the training program of PG students and coordinate program for visits, briefs, supervise reports and returns concerning staff and trainees.

- The second senior Associate Professor will supervise the training program of undergraduates, which will include classes, attendance, tutorials and internal assessments. He will be conversant with duties laid down the institute and MUHS rules and regulations.

- The senior associate Professor will supervise the maintenance of departmental office files, resident log-books and visit/inspection files.

- The senior Associate Professor in consultation with the HOD, will put up demands for purchase of various items for the department.

- The senior associate Professor will assist the HOD in clearing all observations on departmental PG teaching related issues.

ASSITANT PROFESSORS

Reports to Unit In-charge and Head of Department

- To perform duties given under statutory provisions of Medical Council of India and Maharashtra Medical Council, MUHS and VIMS.

- They will assist the Head of the dept/chief of clinical teaching unit in the program of the various courses conducted at the college.

- They will be responsible to the head of dept / chief of clinical teaching unit for the proper care, treatment and disposal of patients entrusted to them.

- They will perform any other duties allotted to them by the Head of dept / chief of the clinical teaching unit.

- They will be nominated by HOD to be OIC Library, museum, seminar rooms

- One assistant professor will be nominated as OIC updates / Seminar / CMEs. He will work under guidance from HOD Medicine.

- The assistant professor i/c of respective PG courses will ensure that a dossier is prepared for each resident.

- The IC course will ensure that all personal particulars, performance appraisal, first records are accounted for and kept in the dossier of respective residents.

- An assistant professor, so nominated by the HOD, will be responsible for the training program, lecture classes, clinical rotations, setting of question papers, marking of answer sheets and tabulation of results for internal assessment.

SENIOR RESIDENTS

Reports to Assistant Professor, Associate Professor, Unit In-charge and Head of Department

- To perform duties given under statutory provisions of Medical Council of India and Maharashtra Medical Council, MUHS and VIMS.
- To abide by various rules, acts and laws related to medical Education and Hospital services Acts related to various allied specialties, enacted by State Government and Government of India for the purpose of conducting various Medical Undergraduates, Postgraduates, Super Specialty courses and Paramedical courses.
- To maintain and continually improve the desired standards of Medical education, Research and Hospital services with reference to NAAC, NABH, JCI and other accreditation authorities. To perform all such duties under statutory provision of various acts laid down by the University which, govern the services of the staff working in the department. This also includes laws, Acts and rules applicable and adapted by the University.
- To implement policies laid down from time to time in order to work towards achieving the Vision and Mission of the Institution.
- Strive to keep up and improve on the reputation of the institution as a Centre of Excellence in the field of Medical Education, Research and Hospital services.
- To maintain disciplined, polite, ethical, moral and humanitarian culture in the department and institution at large.
- **Role and Responsibilities: Academic**
    - Senior Resident is a link between the faculty and residents.
    - He/she will be fully responsible for the clinical work in the unit they are attached with. They also carry out the teaching for under graduate students. They Are required to participate in:
    - Bed side clinical teaching,
        - Conducting Tutorials, Periodic tests and examinations,
        - Inter-disciplinary teaching,

- Special Instructional programs for slow learners,
- Any other academic work given by the Unit Head, Head of the Department and Institution al Head.
- To participate in Post-graduate academic activities.
- To demonstrate bed-side procedures to Resident and Students.

- **Duties and responsibilities: Clinical**
  - They will take ward rounds with the residents and check the physical finding/diagnosis.
  - They will be responsible for the training of residents in all practical procedures (invasive and non-invasive).
  - They will ensure maintenance of all case sheets and ward documents
  - They will keep themselves abreast of the recent advances in Medicine.

RESIDENTS (JR 2 and JR 3)

- They will be conversant with the duties of residents as laid down in the MCI, MMC, MUHS and VIMS regulations.
- On receiving a seriously/dangerously ill patient they will immediately show the patient to the consultant providing cover to the ward or duty consultant.
- As soon as possible after the admission of a seriously ill patient, a provisional diagnosis should be made under the guidance of a faculty member and prompt treatment instituted.
- They will make themselves conversant with the relevant instructions on the disposal of cases, hospital standing orders regarding medical records and will help in finalizing the disposal by the faculty.
- If a seriously ill patient is to be taken for investigations etc, they will organize and ensure that the seriously/dangerously ill patients are accompanied by the hospital staff.
- They will constantly discuss all the patients with the faculty and improve his practical knowledge.
- They will supervise the first-year residents and guide them.
- They will ensure that paramedical personnel detailed for duty in the wards in their charge perform their duties efficiently.

- They will keep themselves abreast of handling all equipment and gain knowledge in operating ECG machines, cardiac monitors, defibrillators and other equipment in the ward under the guidance of senior resident.

- They will ensure that in cases ending fatally, the hospital orders regarding the disposal of the body and documentation are compiled with. If required, they will obtain consent for autopsy and liaise with the pathologist and get the autopsy performed expeditiously. The resident in-charge of the case will be personally present during the autopsy.

- They will perform the emergency duties as per roster and in case of difficulty, immediately call the consultant.

- He will allot patients to undergraduate students and keep record of their attendance.

Duties of First Year Junior Residents (JR 1)

- He will be in professional charge of a ward under the supervision of clinical tutor of the unit.

- He will visit all the patients under his care both in the morning and evening and at such other times may be necessary.

- He will clearly record the details of all the cases in the medical case sheet systematically and will keep them in safe custody. The present condition, changes in symptoms, diagnosis and treatment will be clearly recorded.

- Routine cases: The history be completed within 24 hours of admission. All seriously and dangerously ill patients will be attended immediately on arrival and documents completed promptly.

- He will work up all the cases and the relevant investigation results will be entered in the patients' documents. He will be personally responsible for completing the laboratory forms. He will be responsible for collection and dispatch of specimens.

- The work-up of seriously and dangerously ill cases will be completed speedily within 2 hours of admission. He will inform the concerned specialist immediately about such cases.

- If any invasive investigation is required, the consent of the patient will be obtained and recorded. Such invasive investigations will be carried out only in the presence of a senior (JR 2/3 or SR)

- He will present the cases to the assistant/associate professor/unit chief with him and actively participate in clinical discussions.

- He will keep a personal record of all the interesting cases. He will present cases in the staff clinical meeting under the guidance of faculty member. This will form practical record of clinical training received by him. He will also keep a record of all the invasive investigations performed by him under guidance.

- In addition to discharging professional duties, he will ensure . management of wards is complied with. He will also bring to the notice of the concerned authority if any medical equipment in the ward is damaged or not in working order.

- He will take a tutorial for the undergraduates as and when asked to do so.

INTERNS

- All interns posted in the department of medicine will perform duties as per the departmental duty roster.
- They will assist the resident in-charge during ward rounds, maintain case files, perform procedures under supervision of the residents.
- They will help in blood sampling, filling investigation forms with relevant clinical notes and sending investigations.
- They will accompany the patients for investigations.

NURSING AND WARD STAFF

- Maintenance of ward and ICU beds
- Nursing care of patients.
- Monitoring of patient parameters.
- Blood sampling and sending investigations.
- Maintenance of ward and OPD records.
- Maintenance of crash trolley and ward and ICU equipment.

WARD BOYS/WARD SAHAYIKA

- Ward/department cleanliness
- Shifting of patients

- Delivery of blood and other samples to laboratory.

DEPARTMENT CLERK

- Daily UG and PG attendance.
- Assisting in conduction of exams.
- Maintenance of records in department.
- Maintenance of UG internal assessment files
- Maintenance of PG dossiers

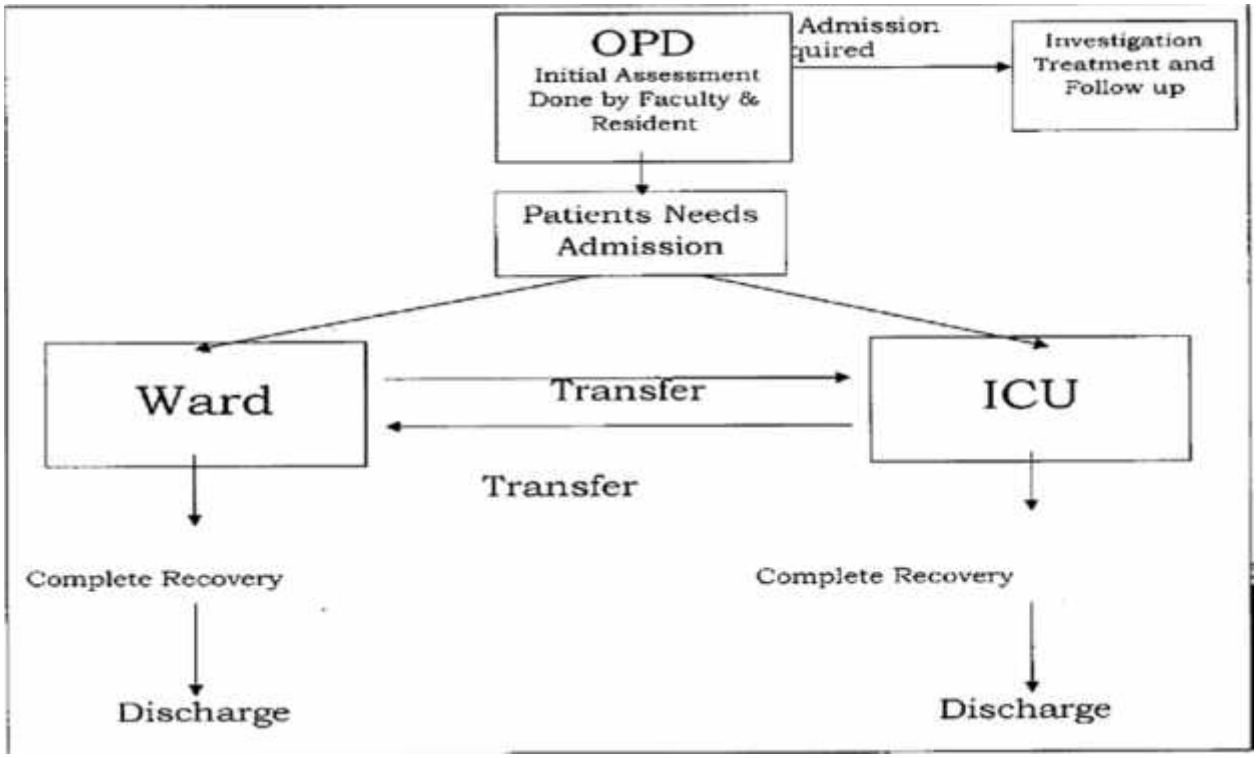
LIST OF RECORDS IN DEPARTMENT OF MEDICINE

a. OPD register
b. IPD register
c. Specialty OPD register
d. ECG, EEG and PFT record book
e. Injections record book

LIST OF FORMS IN DEPARTMENT OF MEDICINE

a. OPD forms
b. Prescription form
c. Laboratory investigation form.
d. USG, CT scan, MRI scan requisition form
e. General consent form.
f. Blood transfusion consent form.
g. High risk procedure consent form.

FLOW CHART



Date: July 2020

Place: Ahmednagar (Maharashtra)

(Brig Arun Tyagi, SM (Retd)
Prof and HOD
Department of Medicine
DVVPF's Medical College

Appendix 'A'
(Ref VIMS letter no. VIMS/DIM/SOP/2020-1 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

MEDICAL INTENSIVE CARE UNIT (MICU)

INTRODUCTION

VIMS Medical Intensive Care unit (MICU) Unit has 20 beds including six respiratory ICU beds. Adult, medical patients and with acute problems requiring critical care and intense management and multidisciplinary approach are admitted in the ICU. The ICU is equipped with state-of-the-art ventilators, BIPAP, Syringe pumps, infusion pumps and modern multi para-monitors and defibrillators. ICU is also equipped with hydraulic ICU beds. Medical and paramedical staffs strictly follow the infection control and biomedical waste management protocols. All the patient related records are maintained meticulously. The doctors/nurses/medical counselor counsel the family members regarding patient's condition, nature of the disease, its prognosis, plan of management and issues arising out of it. This type of counseling helps the relatives to cope with crisis situation.

JOB RESPONSIBILITIES

Head of the department

The MICU will function under overall supervision of HOD medicine. The intensivist /physician in-charge ICU will co-ordinate all clinical activities related to medical team, and also develop procedures and protocols under guidance of the HOD.

Nursing Supervisor ICU

Nursing Supervisor will be responsible for organizing, conducting and supervising all nursing functions in the ICU. She/he will work under the supervision and guidance of the medical

superintendent, chief matron, intensivist/ICU physician and the treating consultants and will be assisted by the head nurse and staff nurses. She/he will co-ordinate the activities of the nursing and non-nursing personnel in her unit to provide highest quality of nursing care. She/he will also supervise the functioning of the staff nurses and organize their training activities.

Nurse In-charge will be responsible for:

- Day to day administration of MICU
- She/he will be in-charge of all the subordinate working in MICU
- Supervision of patient care activities
- Provide and maintain a safe environment for the patients.
- Take care of supplies and equipment.
- Report trouble shooting of equipment to the maintenance staff.
- Keep a sub store for medicines and consumables and manages the inventory
- Take care of ICU admissions/transfer /discharge

Shift in charge (senior staff nurse who act as shift in-charge during each shift)

- Shift In-charge will be responsible for all patient care activities.
- Ensure all shift staff is suitably employed.
- Strictly monitor infection control in the ICU.
- Attend rounds with all the senior functionaries and consultants.
- Perform duties assigned by head nurse from time to time.
- Ensure that all equipment is functioning properly.
- Check and ensure that all documents related to admission, discharge, transfer and shifting patients for any procedure inside or outside hospital, shifting patient on referral to other hospital are maintained at all times.
- Inform the concerned consultant about any fresh admission in ICU.
- Inform any death or untoward incident to the medical superintendent, consultant in-charge of the case, consultant on call for information and further instructions.
- Prepare the shift report and census

- Detailed handover of the activities in the shift to be given to the next shift.
- Prepare discharge file for billing and for discharge summary
- Send extra medicines to the pharmacy.
- Explain in detail about the procedures to the patient.
- Sending patient for procedures
- Collection of samples, dispatch of the samples to laboratory and ensure collection of lab reports
- Make entry in computer about patient condition, events, doctors' order and instructions etc.
- Make a conducive environment for the visitors and try to clear their doubts.
- Detailed hand over to the next shift staff.
- Any works assigned by the superiors from time to time.

Ward Secretary/Clerk

- Ward Secretary will assist the head nurses in all the administrative matters pertaining to the ICU.
- Maintain the admission/discharge/transfer register and keep it up-to-date with all correct information.
- Keep a record of the bed availability in the department and inform the OPD/ casualty/ accounts department accordingly.
- Perform all billing related activities such as enter the doctors' visit, procedure details, room tariff/day in the computer.
- Prepare the individual file as per hospital rules and policies.
- Contact the residents/consultants and when required by the nurses. Prepare the case summary/discharge summary as per the instructions of the consultant
- Entry of medical records in the computer
- Any other responsibilities assign by the superiors' time-to-time.

Nursing Assistant

- To assist the nursing staff and carry out the duties pertaining to patient care.

- Perform bed making, sponge bath, back care, mouth care, hair washing, nail cutting, local treatment etc.
- To give bedpan, chamber pot to the needy patient
- Turning and giving various comfort position to the patient.
- Shaving the patient before various procedures and operations.
- Shifting and transporting the patient from bed to trolley/wheel chair to other departments whenever it is needed. Helping in checking vital signs if asked for.
- Help the nursing staff in carrying out difficult procedures.
- Maintain the inventory of item in relation to their work area.
- Assist the patient for visit to the washroom.
- To measure the output and inform the nursing staff accordingly.

Attendant

- To transfer the patient for various procedures to other departments.
- To give specimens for investigation and collect lab report.
- To collect all procedures report.
- To maintain inventory of item in relation to their work area.
- To do any other responsibilities assigned by the supervisor time to time.

House-Keeping Staff

House-keeping staff should work under the supervision of Head Nurse and directly reporting to house-keeping supervisor. They will be responsible for all cleaning activities in the ward and proper waste disposal.

BED SETUP (PRESETTING)

Before admitting a patient in the MICU the concerned consultant should discuss with MICU In charge about the current status of the patient and the need for ICU transfer. The lCU senior nurse will allot a bed to the patient as per the availability. She must then inform the respective assigned nurse about the patient's arrival and for cubicle set up. Presetting is essential in Critical Care Nursing.

Routine Set-up

- Reception Bed- At least one bed will always be ready in ICU bed to receive patient at any time
- Ensure that the cardiac monitor with cables and electrodes is in working condition
- BP apparatus, stethoscope, thermometer, Pulse Oximeter
- Prepare a tray for IV line access
- IV stands with syringe pump
- ECG machine with all leads
- Glucometer with reagent strips
- Oxygen flow meter with tunings
- Syringes and needs of all sizes
- Identity (ID) bands

In case of critical patients such as those with airway obstruction, cardiogenic shock, cardiac arrest, uncontrolled hemorrhage status epilepticus the nurse on duty must set cubicle with all emergency equipment apart from routine set up such as:

- Oxygen flow meter
- Ambu bag with mask
- Suction machine with proper vacuum and suction catheter Intubation tray with set of ET Tube
- Ventilator with breathing circuit, catheter mount, bacterial filter and test lung
- Rechecked crash cart and defibrillator.
- After arrival of the patient in the department, the duty nurse will receive the patient and keep the patient in bed in appropriate position and will connect the leads of monitoring equipment.
- Explain to the relatives about rules and regulation of ICU and hospital. She must change all clothes and remove valuables and hand over these to the relatives with proper documentation.
- **The doctor in charge of ICU will examine the patient immediately on arrival in ICU and will ensure**
  - The airway, breathing and circulation are maintained adequately.

- Obtain detailed history from patient or relative and carry out complete physical examination and order appropriate investigations.
- Counsel the family regarding patient's condition, treatment options and the prognosis.
- Discuss the issues with the primary consultant and should reach the provisional diagnosis.
- Should again counsel the family members about the nature of the disease, its prognosis and plan of management.
- Simultaneously should take an informed consent from patient/NOK for doing all relevant procedures and treatment.

ROUTINE OF THE MICU

Educational program- Frequent classes and workshops will be arranged in-house for on-the-job training of the interns the nursing staff.

Use of computer- Nurses should enter all details of patients and their progress in electronic medical record. The medical record should be entered in system wise examination and all other events, drug indent and lab services.

Indents and issues

The head nurse will see that all the emergency medications, consumables and the necessary equipment are indented and issued for use. Replenishing of the used medications and consumables are done immediately to avoid any shortage.

Inventories In ICU the items will be grouped like emergency medicines, equipment and surgical items etc. The main purpose of this is for maintaining proper records and auditing the same. There are 7 inventories:

- Drugs inventory
- Surgical instruments inventory
- Crash cart and emergency inventory
- Bio-medical inventory
- General inventory
- CSSD inventory
- Linen inventory
- Housekeeping inventory

- Fridge (items requiring cold chain) inventory and
- Narcotics inventory

Registers Maintained in ICU

- Training record
- Daily report book
- Duty roster
- Billing Register
- Admission -Discharge Register
- Lending and borrowing book
- Transfer out book
- Communication book
- Ventilator utilization book
- Incident report/ Adverse events register
- Re-admission within 48 hrs
- Linen book
- Narcotic register

Counseling

The responsibility of counseling rests with a senior nurse in the MICU, she will counsel the relatives twice a day and whenever necessary. The counseling helps relatives in relieving anxiety. It also will help in developing a rapport with the ICU nurses.

GUIDELINES FOR ICU ADMISSION

Prioritization in ICU

This defines those that will benefit most from ICU to those that will not benefit at all. This will be done after considering over current problems, its prognosis, preexisting comorbidities,

patient & relatives' wish and financial deliberations. The decision will be taken collectively by all involved in his/her treatment

ADMISSION PROCEDURE

- Collect information about the patient prior to admission from the casualty or OPD.
- Age, Diagnosis, Respiratory status, Cardiovascular status, Intravenous lines
- Intra-arterial lines, Infusions in progress any special requirements
- Check all equipment is available and functioning properly.
- On receiving the patient the nurses should make a Quick Assessment of the patient's general condition.
- Observe airway, breathing, circulation, level of consciousness.
- If life threatening complications exist manage those immediately, before any documentary procedure. If there are no immediate life threatening complications, normal admission procedure may be resorted to.
- Transfer the patient from trolley to bed taking care of all IV lines, drainage tubes and airway.
- Connect patient to cardiac monitor.
- Establish appropriate Oxygen therapy; continuation of therapy if already in progress.
- Connect transducers to any monitoring line; arterial line, central line, etc
- Record Base line observations on flow chart and commence IV infusion as ordered + medications
- Assist Doctors in necessary Procedures - Intubation, cannulation, catheterization etc.,
- Proper documentation in Nurses Notes

INFECTION CONTROL PRACTICES

- Strict hand washing with disinfectant- hand washing solution, which is kept in each cubicle before and after touching the patient.
- Separate Stethoscope, Thermometer, Ambu bag with reservoir for the patient to prevent cross infection.
- Follow 'Universal Precautions' when taking care of the patients with infectious diseases or immunosuppressant.

- Carry out following **precautions for procedures**;
    - Scrub hands thoroughly
    - Use cap/gown/ mask (mandatory for all procedures)
    - Use dressing tray (Sponge holder and sterile bowls)
    - Avoid contact with unsterile areas
    - Aim for strict aseptic technique

    Keep things ready for next procedure
- Order for chest X-ray after all invasive procedures.
- Date of insertion of lines, urinary catheter or any drain must be mentioned on the line with adhesive tape and in the patient's records
- All line insertion site dressing should be changed daily or whenever necessary (if it soils). In each shift central line Betadine gauze should be changed.
- All lines tip should be sent for culture and sensitivity after 7th day of insertion or if patient develops any signs and symptoms of sepsis.
- Daily checking of following things to be done by the nurse in each shift for:
- Alarm limits of ECG, respiration and pressure settings on the monitor.
- Calibration of all digital equipment to be done in each shift and prior to central venous and various other pressure monitoring
- Check the Oxygen source and Ambu bag whether tubing is attached to the Oxygen flow meter flow meter.
- Suction apparatus and sterile suction catheter.
- Check ventilator settings and alarm limits
- Initiate CODE BLUE in case of cardiopulmonary arrest. The ICU staff must be fully conversant with code blue

CRITERIA FOR TRANSFERING PATIENTS OUT OF THE MICU

- Patients will generally be transferred out of ICUs when the patient no longer requires intensive multidisciplinary monitoring. However, following guidelines are applicable.
- **Respiratory case**:
    - Mechanical ventilator support is no longer needed (excluding CPAP).
    - The patient requires FIO2 of less than 0.5.

- The patient requires physiotherapy to clear secretions no more often than every 3- 4 hours.

- **Circulatory**

  - No requirement for vasoactive drugs to support cardiac output or arterial blood pressure.
  - The circulation is stable except for required modest volume replacement (pulse rate between 50-110 bpm).
  - There are no signs of failing tissue perfusion, such as tachycardia, new onset confusion

- **Cardiac**

  - Hemodynamic stability
    - Free from complex arrhythmias
    - No respiratory distress
    - Free from severe degree of co-morbidities
    - Free from post MI/ACS complications like MR,VSR, Heart failure

- **Neurologic**

  - The airway and gag reflexes are intact.
  - Tracheostomy (if *in situ*) is functional
  - There is a stable Glasgow Coma Score.
  - Seizures are well controlled.

CARDIAC MONITORING

Purpose: To detect any arrhythmia at the earliest.

Responsible Person: Staff Nurse

Equipment:

- Cardiac monitor & cable
- Electrodes.
- Spirit Swab

- Razor (if required.)

Procedure

- Keep all equipment ready.
- Explain to patient about the need of cardiac monitoring.
- Push power button on, then adjust intensity and set speed to 25-mm/sec.
- Check sweep speed @25 mm/sec
- Insert patient cable to ECG input.
- Clean skin areas where the electrodes will be placed and apply electrodes to patient (Shave if patient is excessively hairy).
- Check that the electrodes have just enough conductive jelly.
- Apply electrodes in areas where there will not be excessive movements.
- Attach patient cable to the chest electrodes. Select lead position.
- Adjust QRS complex (amplitude) and adjust QRS volume.
- Set limits for heart rate alarm. Make sure the alarm button is on.
- Print out on ECG strip (from central monitor) and attach to case file.

Date: July 2020

Place: Ahmednagar (Maharashtra)

(Brig Arun Tyagi, SM (Retd)
Prof and HOD
Department of Medicine
DVVPF's Medical College

Appendix 'B'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-1 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE- OXYGEN THERAPY

Introduction

Oxygen (O2) administration is one of the most frequently performed procedures in a hospital casualty, intensive care units, high dependency area and in wards to provide respiratory assistance and to combat hypoxia in practically all the critically and acutely ill patients. Purpose of this SOP is to lay down guidelines for prompt and timely administration of oxygen to the needy patients by the health care staff.

Objectives

- To treat the effect of hypoxemia
- To increase alveolar Oxygen tension
- To decrease respiratory effort and thereby avoid fatigue of respiratory muscles.
- To decrease the myocardial work necessary to maintain a given arterial O2 tension (PaO2)

Points to Remember

- **Nasal Cannula** Provides 35 -40% O2, O2 flow rate should be 2-6 l/minute. One must ensure that nostrils and upper airways are clean and patent.
    - Position the cannula tips in the patient's nose so that it fits comfortably.
    - Secure the cannula from behind the ears and fasten it below the chin.
    - Check nostrils and cannula and clean whenever necessary.
- **Masks**
    - Plain mask; provides an O2 concentration of 35 -40%. Flow rate of 6 -I0 l/min Venturi mask; provides an O2 concentration of 24 -50%. Flow rate to be adjusted as per percentage set

- Place the mask over the patient's nose and mouth and under the chin so that it fits the patient's face.
- Adjust the elastic strap around the patient's head and position the strap below the ear and around the neck

- **Equipment** required for Oxygen Therapy
  - Oxygen Source -central O2 supply or O2 Cylinder
  - Flow meter
  - Humidifier
  - Disposable connecting tubing
  - Various O2 delivery systems- Nasal cannula, Plain mask or Venturi Mask.
- **Procedure**
  - Explain the procedure to the patient.
  - Select appropriate O2 delivery system depending on the patient's current oxygenation status.
  - Connect the O2 delivery system and flow meter to the oxygen source.
  - Turn on the oxygen.
  - Set the flow rate as prescribed or required to maintain desired SaO2
  - Record the flow rate and immediate patient's response.
  - Periodically assess patient's condition by pulse oximetry or by ABG.

AMBU - BAGGING

Purpose

- To ventilate apnoeic or spontaneously breathing patients to augment ventilation
- To deliver supplemental Oxygen.
- To prevent hypoxia.

Required Equipment

- Ambu bag connected to an Oxygen supply source.

- Face Mask
- Pulse Oximeter.
- Gloves
- Sterile towel
- Suction apparatus with connections.
- Suction catheter.

Procedure

- Check the Ambu bag for patency.
- Explain the procedure to patient if conscious.
- Wear gloves and mask
- Ventilate the patient by compressing the Ambu bag with other hand; observe chest movement.
- Release pressure on the Ambu bag.
- If secretions present, clear the airway by suctioning.
- Repeat the procedure as required.

Artificial Ventilation for Ventilated patient using an Ambu bag

- Check the function of Ambu bag
- Explain the procedure to the NOK or the patient if conscious.
- Wash hands and put on sterile gloves.
- Connect the supply tubing to supplemental oxygen source and adjust gas flow.
- Attach pulse oximeter and monitor SaO2 throughout the procedure. It should be above 95%.
- Disconnect the ventilator from catheter mount with filter and attach Ambu bag.
- Place the other end of the ventilator tube on a sterile towel.
- Ventilate the patient by compressing the Ambu bag observing chest movement.
- Check for secretion, if secretions present clear the airway by suctioning.
- Repeat the procedure as required.

- Once the procedure is complete disconnect the Ambu bag and connect the ventilator. Observe chest movements. Recheck ventilator parameters.
- Document procedure

ENDOTRACHEAL INTUBATION

Purpose

- To provide a patent airway
- To prevent aspiration in patients with altered sensorium and those with impaired gag reflex.
- To enable mechanical ventilation.
- To facilitate tracheal suctioning.

Equipment Required

- Sterile gloves with mask, sterile towels.
- Oxygen supply
- Suction apparatus
- Ambu bag with facemask.
- Suction catheters.
- Endotracheal tubes of various sizes.
- Oral airway
- Stylet and Magill forceps.
- Laryngoscope with blades.
- Tongue depressor.
- Xylocaine jelly.
- 10 c.c. Syringe for inflation of ET tube cuff.
- Local anaesthetic agent -Xylocaine 4% spray.
- Drugs - Sedation, muscle relaxants if ordered.
- Tape, ties.

- Catheter mount
- Stethoscope.
- Pulse Oxymeter.
- ETC02 Machine

Procedure

- Explain the procedure to patient and relatives and obtain informed consent.
- Remove dentures if present.
- Check equipment availability and functionality.
- Aspirate the gastric contents.
- Positioning of the patient – supine position with neck extended.
- Administer of 100% oxygen to the patient for five minutes.
- Administer drugs as ordered.
- Provide reassurance to the patient (if conscious) throughout the procedure
- Observe the patient's heart rate and O2 saturation throughout the procedure.
- Lubricate the tube, check the cuff and mount the tube on the stylet.
- Introduced the ET tube into the larynx using Magill forcep.
- Provide cricoid pressure if required.
- Once the ET tube is in position, inflate the cuff and connect to O2 supply, suction the patient.
- Auscultate lungs for bilateral air entry.
- Mark the tube at the level of the patient's mouth and tie the tube securely in position using ties and adhesive tape.
- Perform chest x-ray.
- Position the patient comfortably.
- Clean the used articles and replace in position.

Ensure proper documentation in patient's case file and in nurse's Notes;

- Condition of patient before and after intubations.
- Date, time and person
- ET tube size, mark.
- Drugs used.
- Oxygen delivery system- Ventilator, Central O2 supply or O2 cylinder.

- **T -Piece**
  - T- piece is connected to a tracheotomy or ET tube and has color coded adaptors for different O2 concentration
  - T-piece will be used during weaning the patient off the ventilator.
  - Provides 35 -60% of O2 and a flow rate up to 15 l/min.

EXTUBATION

Purpose

- To return the patient to normal respiratory function.
- To ensure patient is able to maintain a patent airway.

Equipment Required

- Oxygen source
- Intubation tray
- Suction apparatus
- Suction catheters.
- Face Mask
- Sputum Mug
- Scissors.
- Syringe 10 ml
- Pulse Oximeter.
- Sterile gloves.
- Emergency drugs.

Procedure

- Explain the procedure to the patient.
- Provide sitting upright position to the patient.
- Check all equipment, keep facemask ready.
- Carry out Endotracheal suctioning.
- Carry out RT aspiration.
- Deflate ET tube cuff and remove ties.
- Once tube is removed administer oxygen via facemask.
- Observe patient's heart rate and respiration -Rate, Rhythm and Depth.
- Encourage the patient to perform deep breathing exercises, to cough and to bring out any secretion .
- Position the patient comfortably.
- Clean and replace articles.
- Document the procedure.

Date: July 2020

Place: Ahmednagar (Maharashtra)

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Appendix 'C'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DR VITHALRAO VIKHE-PATIL FOUNDATION'S MEDICAL COLLEGE AND HOSPITAL, VADGAON GUPTA, POST- MIDC, AHMEDNAGAR

DEPARTMENT OF MEDICINE

STANDARD OPERATING PROCEDURE FOR DEFIBRILLATION AND CARDIOVERSION

Introduction:

Electrical cardioversion and defibrillation are procedures in the management of patients with cardiac arrhythmias. Cardioversion is the delivery of energy that is synchronised to the QRS complex, while defibrillation is the non-synchronised delivery of a shock randomly during the cardiac cycle. There is good evidence to suggest that **minimal time delay to defibrillation for Ventricular Fibrillation and Pulseless Ventricular Tachycardia improves patient survival**.

Background Information:

- **Defibrillation**

Defibrillation is **treatment for life-threatening cardiac arrhythmias such as ventricular fibrillation and pulseless ventricular tachycardia**. Electrical energy is delivered to the heart via a device called a defibrillator and pads which are placed on the chest. This depolarises a critical mass of the heart muscle, terminates the arrhythmia, and allows normal sinus rhythm to be re-established by the body's natural pacemaker, in the sino- atrial node of the heart.

Defibrillators can be external, transvenous, or implanted, depending on the type of device used or needed. **This SOP will only discuss external defibrillation**.

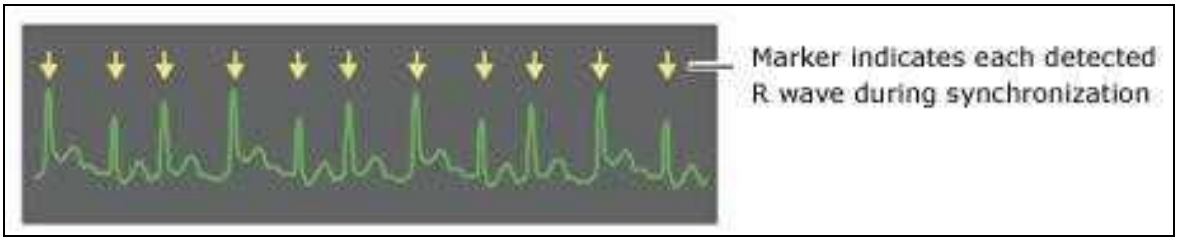
Most defibrillators are energy-based, meaning that the devices charge a capacitor to a selected level and then deliver a pre-specified amount of energy in joules. The amount of energy which arrives at the myocardium is dependent upon the selected energy level and the transthoracic impedance (which varies by patient). Defibrillators can also deliver energy in a variety of waveforms, characterised as **monophasic**, where the current flows in one direction, or **biphasic**, where there are two current pulses in opposite directions. **Biphasic waveforms defibrillate at lower energies** than monophasic waveforms.

Biphasic defibrillators are now the only one used in ICU.

- **Cardioversion**

Cardioversion terminates arrhythmias such as, *atrial fibrillation, atrial flutter, atrioventricular nodal re-entrant tachycardia, atrioventricular re-entrant tachycardia, or haemodynamically stable ventricular* tachycardia, by delivering a **synchronised** shock. By depolarising all excitable

tissue of the circuit and making the tissue refractory, the circuit is no longer able to propagate or sustain re -entry. As a result, cardioversion terminates those arrhythmias. **By pressing the "SYNC" soft key, the defibrillator will enter "SYNC" mode and the synchronising circuit within the defibrillator will detect the patient's R-waves.** When the shock button is pressed and held, the unit discharges with the next detected R-wave, thus avoiding the vulnerable T-wave segment of the cardiac cycle**. When in the "SYNC" mode, the unit displays downward arrow markers above the ECG trace to indicate the points in the cardiac cycle (R waves)** where discharge can occur.



Definitions:

- **Energy**:
  - Energy in a defibrillator is **expressed in joules**. A joule is the unit of work associated with one amp of current passed through one ohm of resistance for one second.
  - Joule is generally stated as follows:
    - Joules (Energy) = Voltage X Current X Time
    - Joules have become a surrogate for current in modern defibrillator language.
- **Current**:
    - **Current is what actually defibrillates** the heart. It is also expressed as Voltage/Impedance (resistance).
- **Impedance**:
    - **Resistance to Flow**; there is resistance in the electrical circuit itself as well as in the patient. The amount of impedance in a patient is difficult to determine as it relates to body mass, temperature, diaphoresis, and quality of the contact with paddles or pads. Impedance is expressed in ohms (ohms).

Indications:

Defibrillation

- Shockable Rhythms: Ventricular Fibrillation (VF), Unconscious Ventricular Tachycardia (VT)

Cardioversion

- Tachyarrhythmia's causing hemodynamic compromise, e.g. VT, SVT, AF, Atrial Flutter, Atrial tachycardia, Junctional tachycardia

Before Procedure:

- Emergency trolley must be checked each shift by an RN. Infection Control guidelines are to be followed.

- All drugs administered during an emergency (under the direction of a medical officer) are to be documented during the event, then prescribed and signed following the event.
    - If there are no signs of life (loss of consciousness, no pulse, abnormal

      (agonal) breathing, commence immediate CPR and call for help except if the ICU team are at the bedside.
    - Defibrillation or cardioversion should only be done by accredited staff following ALS assessment
    - Defibrillation pads must be checked for an expiry date
    - Defibrillation pads must be in good contact with chest wall
    - One defibrillation pad must be positioned **at the mid axillary line, left 6th intercostal space and one to the right parasternal area 2nd intercostal space**
    - **Before discharging the defibrillator "Stand clear" must be stated loudly and clearly and a visual sweep of the bed area for any hazards**
    - Electrical hazards (jewellery, water, ECG electrodes, GTN patches) must be removed before discharge of defibrillator
    - When **Cardioversion procedure is going to be performed the "SYNC" mode must be activated**

Equipment:

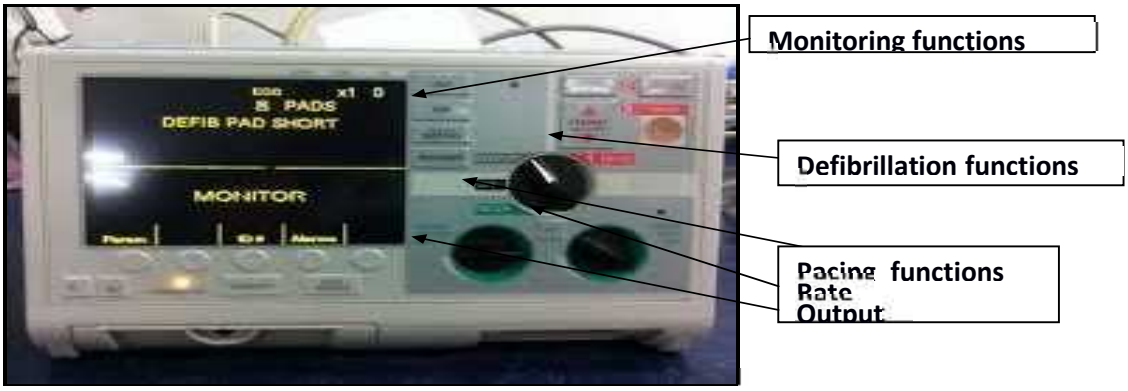
- Defibrillator
- Multi-function adult pads
- Emergency trolley
- IV access
- Mask size 3 or 4 and resuscitation bag
- Suction equipment
- Sedative agent for cardioversion as appropriate

Procedure for Defibrillation

- Defibrillation as soon as possible provides the best chance of survival in patients with VF or pulseless VT
- ARC guidelines for shockable rhythms should be commenced (see Appendix 1) ▪ Clean and shave the area where the pads need to be applied (for cardioversion)
- Remove pads from package and separate lead wires
- Remove pad protective liner
- Connect the pads to the defibrillator
- Apply the defibrillator ECG electrodes to patient's chest
- **Apply a pad to mid axillary line, left 6th intercostal space and one to the right parasternal area 2nd intercostal space**

- ***If patient has implantable cardioverter defibrillator (ICD) or permanent pacemaker the pads should be placed on chest wall at least 8cms from the device***

- Ensure there are **no IV lines or ECG electrodes under the pads**



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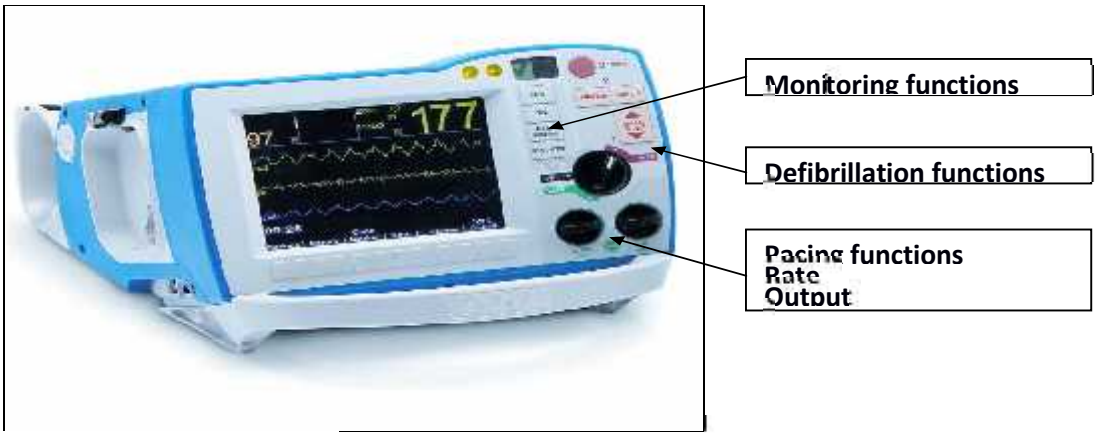

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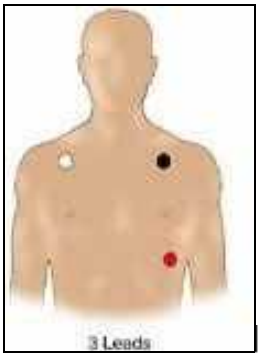
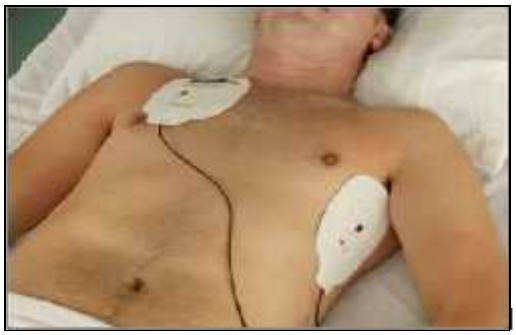
Multi-fuction pads





(Correct placement of defibrillation pads)

- Smooth the pads from the centre outward to the edges with finger tips to ensure there are no air pockets under the pads
- Pads are not repositionable. Replace with new pads if they need to be repositioned

- **Replace pads every 24 hours or 50 defibrillations** (or as per Manufacturers recommendations)
- **Turn dial onto defibrillation** (Defib)

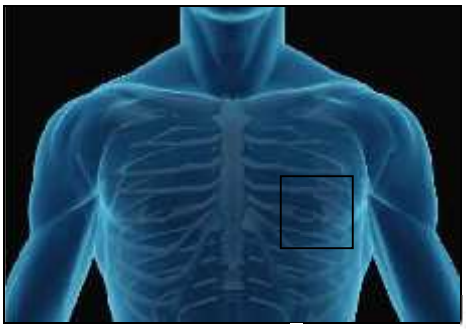
Steps for defibrillation of shockable rhythms

- The **defibrillator will default to biphasic mode and energy 200 joules** *if not press energy select button* to change joules
- **Charge** the defibrillator
- In a loud clear voice say **"STAND CLEAR"** and ensure all staff have moved away from the bed
- **Deliver the shock** and **recommence compressions**
- **Observe patient** and ECG monitor for results
- **Continue with ACLS algorithm for shockable rhythms** (see Appendix 1)

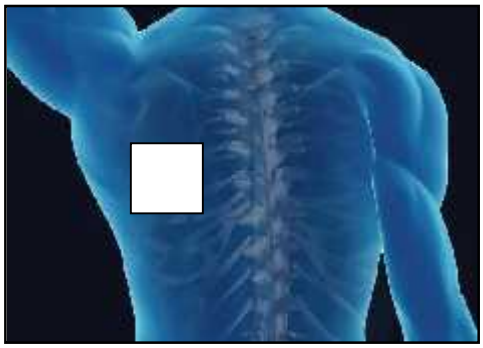
Procedure for Cardioversion

- **Explain procedure** to patient
- **Sedation** may be required if the patient is fully conscious
- Follow ARC Algorithm for Tachyarrhythmias
- **Place ECG electrodes from the defibrillator behind the shoulders and away** from where the defibrillation pads are placed

- Pay **careful attention to skin preparation**; make sure the surface is dry, free of hair and lotions that can impact adhesion.
- Remove pads from the package and separate the lead wires
- Smooth the pads from the centre outwards to ensure there is **no air between the pads and patient's skin**
- If patient has implantable cardioverter defibrillator (**ICD) or permanent pacemaker the pads should be placed on chest wall at least 8cms from the device**
- Ensure there are **no IV lines or ECG electrodes under the pads**
- Smooth the pads from the centre outward to the edges with finger tips to ensure there are no air pockets under the pads
- Pads are not repositionable. Replace with new pads if they need to be repositioned Replace pads every 24 hours
- The **defibrillation pads for Cardioversion can be placed either Anterior–Posterior (AP) or Anterior-Anterior** (AA), though ***AP placement is preferable for maximum current flow through the atria***
- **Posterior pad** is placed left lateral of the spine and just under the scapula
- **Anterior pad** is placed mid clavicular,4th intercostal space, lateral to the sternum

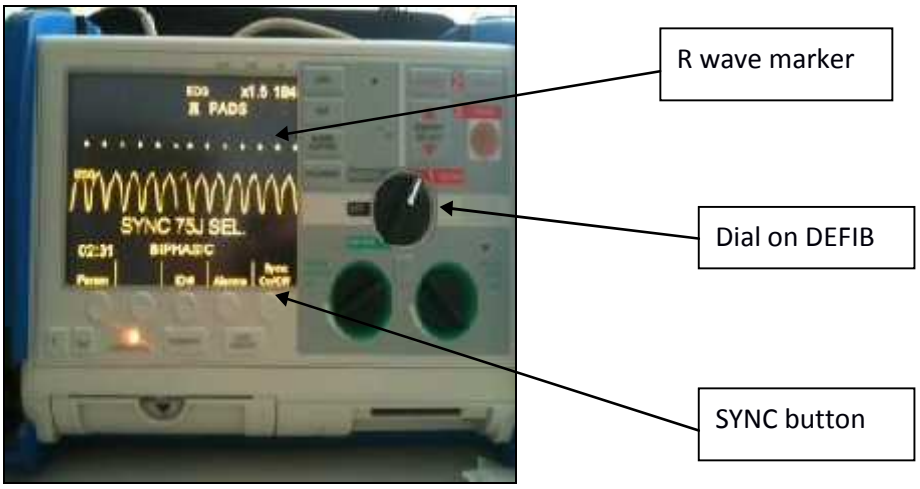


Anterior placement of defib pad [3]



Posterior placement of defibrillation pad [3]

- **Turn defibrillator dial to Defib**
- ***Ensure SYNC mode is activated*** by pressing SYNC button on defibrillator
- **Ensure R wave marker is seen on ECG trace**, if not increase amplitude of ECG trace



- **Select energy required 50 - 100 joules** (for cardioversion of SVT, AF and conscious VT) depending on patient's weight
- **Press Charge** button
- In a loud clear voice say "**STAND CLEAR"** and ensure all staff have moved away from the bed
- **Press shock**
- **Check rhythm**
- Follow ARC Algorithm for Tachycardia's (see Management of Arrhythmias ICU Guideline_2011 Appendix 5)

Points to Remember:

- Minimise interruptions to CPR when defibrillating
- Manual chest compressions should stop only when delivering a shock
- Avoid placing pads over ECG electrodes, ECG leads, CVC sites, implanted devices, medication patches
- Move patient's limbs away from metal fixtures e.g. bed rails
- Move flow of oxygen away from patient's chest during delivery of shock as risk of spark
- **Check that the patient has motor response to shock** which indicates delivery of the charge. If no response may be that defibrillator has flat battery or lead fracture

- Replace electrode pads every 24hours or 50 defibrillation shocks (Manufacturers recommendations)
- Check patient's skin for burns

If patient not intubated:

- Recover in left lateral position; administer 0_2 at 6L/min.
- Maintain NBM until fully conscious.
- Observe for alterations in respiratory pattern.
- Continuous ECG monitoring.
- ½ hourly BP and pulse until stable.
- Obtain 2 hourly and PRN rhythm strips.
- Perform 12 lead ECG.
- Report arrhythmias and abnormal observations

Contraindications: Defibrillation

- If patient has current **Do Not Resuscitate order**
- **Non-Shockable rhythm**:
    - Asystole,
    - PEA,
    - Bradycardias,
    - Supraventricular Tachycardias,
    - Conscious VT

Cardioversion

- VF,
- unconscious VT
- Current Digoxin therapy (if emergency cardioversion necessary, reduce energy)

Precautions:

- Be aware of **electrical hazards**, the presence of water, metal, oxygen and flammable substances
- **Move flow of oxygen away from patient's chest** during delivery of shock as risk of spark

- Manual chest compressions should not continue during the delivery of a shock
- **Avoid placing pads over ECG electrodes, ECG leads, CVC sites**, implanted devices, medication patches
- **Do not allow any person to have direct contact with the patient during defibrillation**
- **Avoid delivering the shock with a space between the pads and patients chest** as it may cause a spark hazard
- **Do not defibrillate if patient and /or resuscitator are in a wet or explosive environment**
- Do not use pads if electrodes are damaged

Troubleshooting:

If defibrillation or cardioversion is unsuccessful check: o 4 H's and 4 T's (see tables below)

o Check pad placement

- o Check if there is adequate skin contact. Clean and shave as necessary o Change the defibrillator pads
- o Ensure joules selected are fully charged on defibrillator
- o Ensure shock button is pressed
- o Ensure defibrillator battery is not depleted

Performance Measures

All incidents are documented using the hospital reporting system

<u>Management of Reversible causes: 4 H's</u>

4 H's	MANAGEMENT
Hypoxia	➢ Check and maintain airway ➢ Insert Guedel, ETT, LMA, surgical airway if required ➢ Check oxygenation and ventilation
Hypovolaemia	➢ Replace blood or fluid loss Replacement of blood with: - Crystalloid/ Colloid - Blood Products ➢ Anaphylaxis: Management of ABC - Adrenaline (IMI, S/C, or IV) - Hydrocortisone - Correct hypovolaemia

Hypo/Hyperkalaemia	Hypokalaemia ➢ Potassium of less than 3.5mmol/L ➢ Replace Potassium ➢ Hyperkalaemia ➢ IV calcium, 10 mLs 10% CaCl2, up to 3 ampoules, each over 5 minutes ➢ hyperventilation: $CO_2 + H_2O \Leftrightarrow H_2CO_3 \Leftrightarrow H^+ + HCO_3^-$ ➢ 50mls 50 % glucose + 10 units Actrapid over 10-15 minutes. ➢ $NaHCO_3$ to correct acidosis ➢ Nebulised salbutamol
Hypo/Hyperthermia	Hypothermia ➢ Active core re-warming ➢ Warmed humidified oxygen ➢ Warmed intravenous fluids ➢ Peritoneal lavage ➢ Extracorporeal warming ➢ Pleural lavage Hyperthermia ➢ Cooling Blankets ➢ Cooling packs or ice to head, axilla, chest, groin and legs ➢ Cooled IV fluids

<u>Management of reversible causes: 4 T's</u>

4 T's	**MANAGEMENT**
Tamponade	➢ Pericardiocentesis ➢ open sternotomy wound if post cardiac surgery
Tension Pneumothorax	➢ Thoracentesis -Chest tube insertion if there is time or a large bore needle through the 2nd intercostal space in the mid-clavicular line
Toxins/tablets	➢ Antidote ➢ Charcoal (within 1 hr of ingestion) ➢ Supportive measures ABCDEFG
Thrombus	➢ Thrombolysis, embolectomy or cardiopulmonary bypass to allow operative removal of the clot.

Appendix 'D'
(Ref VIMS letter no. VIMS/DIM/SOP/2020-1 dated 07 July 2020)

DR VITHALRAO VIKHE-PATIL FOUNDATION'S MEDICAL COLLEGE AND HOSPITAL, VADGAON GUPTA, POST- MIDC, AHMEDNAGAR

DEPARTMENT OF MEDICINE

STANDARD OPERATING PROCEDURE FOR ENDOTRACHEAL INTUBATION

I. Introduction:

This SOP covers the procedure of endotracheal intubation. The purpose of SOP is to lay down guidelines for insertion of an endotracheal tube (ETT) in patients requiring invasive ventilatory support. An endotracheal tube may be needed in routine (preoperative placement), non-urgent placement and urgent case scenarios.

II. Points to Remember:

- **Supervision:** The procedure will be initially performed under supervision of and in verbal collaboration with the senior physician. Supervision will not be required once necessary expertise has been attained by the junior health care worker. However, the HCW performing the ET insertion must notify the case in-charge physician immediately in case of any untoward incident during the procedure.

- **Indications:**

  Endotracheal intubation may be indicated but not limited to

  - **o** Maintaining a patent airway,
  - **o** Facilitating oxygenation and ventilation,
  - **o** Reducing the risk of aspiration, and
  - **o** Assisting in the removal of secretions.

Õ **Precautions:**

- **o** The clinician performing intubation should be able to rescue patients whose airway is difficult to intubate.
- **o** Proper cardiovascular monitoring as well as provisions for managing difficult airways must be in place.
- **o** Patients with a history of or anticipated difficult endotracheal intubation or patients with significant respiratory or hemodynamic instability will be intubated in collaboration with an anesthesiologist.

III. **Equipment**:

The following materials may be required during endotracheal intubation:

1. **Laryngoscope blades**, typically starting with Mac 3
2. **Laryngoscope handle**, checked for sufficient battery power
3. Proper size cuffed endotracheal tube with 10 ml syringe and stylet
4. Breathing Circuit (e.g. Jackson Reese resuscitation circuit)
5. **Ambu bag**
6. **Proper size face mask**
7. Proper size nasopharyngeal airway
8. Proper size oral airway
9. End tidal CO2 detector
10. Stethoscope
11. **Oral suction apparatus**
12. Appropriate **hemodynamic and oxygen saturation monitoring** equipment
13. **IV access**
14. Supplemental oxygen
15. Appropriate **sedating, vasoactive, and reversal agents**.
16. Appropriate ETT securing device / materials
17. **Ventilator**, checked and ready to be connected

IV. Procedure

A. Pre-treatment evaluation:

Assess clinical necessity for intubation. If informed consent is indicated this must be obtained before sedation begins. A directed history and physical examination should be performed that includes:

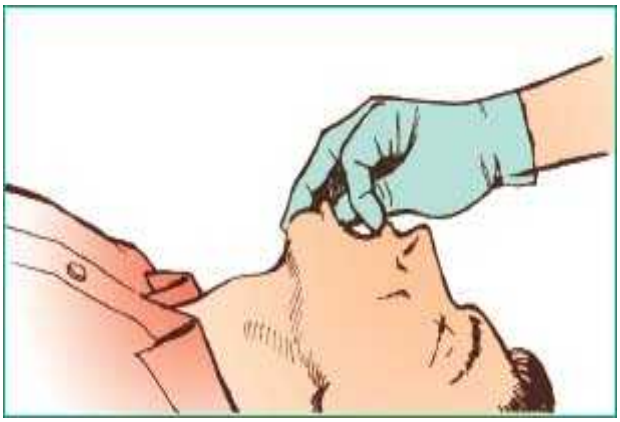
1. **Relevant history** of acute and chronic diseases
2. **Level of emergency**, level of resuscitation efforts indicated and probability of successful outcome (***Code Status***)
3. History of prior intubation
4. Physical exam with **attention to anatomical defects** of the airway and evidence of respiratory compromise
5. **Current medications and allergies**
6. Time of **last oral intake**
7. Assess airway using **Mallampati classification**, extent of mouth opening, thyromental distance, palate width, and neck mobility

C. Patient preparation

1. **Explain procedure** to patient or next-of- kin (NOK) and **acquire consent** unless emergency
2. Explain procedure to family members if they are present
3. Assess for **sufficient IV access** and attachment appropriate cardiovascular and respiratory **monitoring equipment**.
4. **Position patient** in sniffing position. Use blankets as ramps if patient requires additional aligning of oral, pharyngeal, and laryngeal axes.

D. Performing the procedure:

1. **Wash hands and don personal protective equipment**
2. **Check** equipment and check endotracheal cuff for leaks
3. **Insert stylet** into endotracheal tube.
4. Attach blade to battery base and assess light function. Have backup blades of different type and sizes available.
5. **Preoxygenate with 100% O2** using ambu bag or Jackson-Reese circuit for 3- 5 minutes to wash out residual nitrogen gas.
6. If necessary, administer **appropriate sedatives** or opioids.
7. Have an assistant **apply cricoid pressure**.
8. Assess for ability to mask ventilate.
9. If appropriate administer appropriate neuromuscular blockade and assess for clinical effect.
10. Grasp the **laryngoscope in the left hand**
11. Open the patients' mouth with the **cross-finger technique**



(Cross-finger technique for opening mouth)

12. **Slowly insert the blade into the right side of the patient's mouth** using it to push the tongue to the left. Advance the blade inward and midline toward the base of the tongue.
13. The **tip of the curved blade should be placed in front of the epiglottis** in the valecula. The tip of the straight blade should be placed under the epiglottis. Apply pressure caudally and upward with the handle at a 45° angle to the bed.

14. **Lift the handle until the vocal cords are visualized** ensuring that the blade or handle is not levered against the incisors.
15. **Grasp the ETT tube with stylet inserted** in the right hand.
16. **Gently insert the ETT** along the right side of the mouth under direct visualization of the vocal cords until the cuff is no longer visible.
17. **Firmly hold the ETT in place, withdraw the blade, remove the stylet, and inflate the ETT cuff with 5-10ml of air**.
18. Attach end tidal CO2 monitor and Jackson-Reese circuit to the ETT and give positive pressure breaths.
19. **Assess for proper placement of ETT** by end tidal CO2 waveform, fogging in ETT, bilateral breath sounds, symmetric chest movement, and absence of breath sounds over the epigastrum, as well as return to baseline vital signs.
20. If assessment indicates that the ETT is not placed in the trachea, deflate the cuff and remove the ETT. Resume mask ventilation with 100% O2. Consult with ICU fellow or anesthesia staff on strategy to reattempt intubation.
21. If breath sounds are absent on the left, deflate the cuff and withdraw the ETT 1-2cm and evaluate for correct placement.
22. **Palpate the suprasternal notch feeling for the ETT cuff**.
23. Attach the **secure the ETT** with tape or appropriate device.
24. **Attach the ETT to the mechanical ventilator**.

F. Follow-up treatment

1. **Order and review STAT portable CXR** to evaluate the location of the tip of the ETT.
2. Order and review **arterial blood gas 30 minutes post intubation**.

V. Documentation

1. Documentation of the pretreatment evaluation and any abnormal physical findings.
2. Record the time out, indication for the procedure, procedure, type and size of tube used, method used, EBL, the outcome, how the patient tolerated the procedure, medications (drug, dose, route, & time) given, complications, and the plan in the note. Clinical events may also require an event or progress note. The consultant in-charge of the patient should be notified of the intubation if not already aware.

Appendix 'E'
(Ref VIMS letter no. VIMS/DIM/SOP/2020-1 dated 07 July 2020)

DR VITHALRAO VIKHE-PATIL FOUNDATION'S MEDICAL COLLEGE AND HOSPITAL, VADGAON GUPTA, POST- MIDC, AHMEDNAGAR

DEPARTMENT OF MEDICINE

STANDARD OPERATING PROCEDURE FOR VENTILATOR MANAGEMENT

PART I: NON-INVASIVE VENTILATION

Introduction:

The ventilatory support to the critically ill, whether non-invasive or invasive, is one of the most frequently performed procedures in any intensive care unit. Timely assisted ventilation is of crucial importance in correcting hypoxia in patients of respiratory failure from any cause. Respiratory Failure includes any condition that affects breathing and ultimately results in failure of the lungs to function properly. The main tasks of the lungs and chest are to get oxygen into the bloodstream from inhaled air and, at the same to time, to eliminate carbon dioxide (C02) from the bloodstream through exhaled air. The respiratory failure may be hypoxic (Type 1-the level of oxygen in the blood becomes dangerously low), and/or hypercapnic (Type 2- the level of C02 becomes dangerously high).

Case definition: Respiratory failure is defined as a failure of gas exchange manifested either as hypoxemia (PO_2 <60mm Hg on room air) i.e. inadequate blood oxygenation or hypercapnia ($PaCO_2$>45 mm Hg) i.e. excess of circulating carbon dioxide or frequently a combination of both types of gas exchange abnormalities.

Types of Ventilation: The ventilatory assistance can be invasive where the patient needs to be intubated or non-invasive (NIV). NIV should be preferred mode of ventilatory support in conscious, cooperative patients with intact upper airway anatomy. However, the treating physician must remain alert to change over to invasive ventilation if NIV is not successful.

NIV- Definition: Noninvasive ventilation (NIV) can be defined as a ventilation modality that supports breathing by delivering mechanically assisted breaths without the need for intubation or surgical airway. Theoretically, NIV can be of two types; negative pressure ventilation (NVP) which is only of historical value and **Non-invasive positive-pressure ventilation (NIPPV).** NIPPV is further subdivided into

CPAP- Continuous positive airway pressure,

BiPAP- Bilevel positive airway pressure, and

VAPS- Volume-assured pressure support.

Indications: NIPPV is indicated in patients with appropriate diagnosis with potential reversibility. The important indications of NIPPV in adults are as follows:

- Obstructive sleep apnea syndrome
- Chronic obstructive pulmonary disease with exacerbation
- Bilateral pneumonia
- Acute congestive heart failure with pulmonary edema
- Neuromuscular disorders
- Acute lung injury
- Weaning from ventilator

Criteria: Non-invasive Positive Pressure Ventilation (NIPPV) is indicated if patient has any two of the following clinical criteria are fulfilled.

- Moderate to severe respiratory distress
- Tachypnea (RR more than 25 / min)
- Accessory muscle use or abdominal paradox
- Blood gas derangement pH < 7.35, $PaCO_2$ > 45 mm Hg
- PaO_2 / FiO_2 < 300 or SPO_2 < 92% with FiO_2 0.5

Contraindications: There are no absolute contraindications for the use of NIPPV. Some contraindications have, however, been suggested

- Non-availability of trained medical personnel
- Inability to protect the airways -Comatose patients, patients with CVA or bulbar involvement, confused and agitated patients. Upper airway obstruction
- Hemodynamic instability- uncontrolled arrhythmia, patient on very high doses of inotropes, recent myocardial infarction.
- Inability to fix the interface -Facial abnormalities, facial burns, facial trauma, facial anomaly.
- Severe GI Symptoms – vomiting, obstructed bowel. Recent GI Surgery., Upper G.I. Bleed
- Life threatening hypoxemia
- Copious secretions
- Conditions where NIPPV has not been found to be effective

NIV should be applied simultaneously to a patient in acute respiratory failure **in addition to the rest of the treatment** based on the clinical criteria, provided there is no contraindication.

PROTOCOL FOR APPLICATION OF NIPPV for successful noninvasive ventilation**.**

- **Patient interface** –Nasal or oronasal mask
- **Mode of ventilation**:
    - **BIPAP**--Spontaneous or spontaneous timed mode in portable pressure ventilators or NIV option on conventional ventilators
    - **Pressure support /Pressure control /Volume control** – conventional ventilators
- **Ventilator settings**

Explain therapy and its benefit to the patient in detail. Also discuss the possibility of intubation.

- Choose the correct size interface. Oronasal mask in acute respiratory failure is preferred.
- Set the NIPPV portable pressure ventilator in spontaneous or spontaneous /timed mode.
- **Start with very low settings**. Start with low inspiratory positive airway pressure **(IPAP) of 6 – 8 cm** H20 with **2 to 4 cm H20 of EPAP** (Expiratory positive airway pressure). The difference between IPAP and EPAP should be at least 4 cm H20.
- Administer **oxygen at 2 liters** per minute.
- Hold the mask with the hand over his face. Do not fix it.
- **Increase EPAP by 1-2 cm increments till all his inspiratory efforts are able to triggers the ventilator.**
- If the patient is making inspiratory effort and the ventilator does not respond to that inspiratory effort, it indicates that the patient has not generated enough respiratory effort to counter auto PEEP and trigger the ventilator (in COPD patients). Increase EPAP further till this happens. Most of the patients require EPAP of about 4 to 6 cm H2O.Patient who are obese or have obstructive sleep apnea require higher EPAP.
- **When all the patient's efforts are triggering the ventilator, leave EPAP at that level.**

- Now **start increasing IPAP in increments of 1-2 cm** up to a maximum pressure, which the patient can tolerate without discomfort and there is no major mouth or air leak.
- In some NIPPV machine, **inspiratory time** (Ti) can be adjusted. Setting the Ti at one second is a reasonable approach.
- Now **secure interface with head straps**. Avoid excessive tightness. If the patient has a nasogastric tube put a seal connector in the dome of the mask to minimize air leakage.
- After titrating the pressure, **increase oxygen** to bring oxygen saturation to around 90%.
- **The settings may be different in wakefulness and sleep**, readjust them accordingly.

When NIPPV is being initiated for acute respiratory failure, close monitoring and the capability to initiate endotracheal intubation and other resuscitation measures should be available in the same setup. Start NIPPV preferably in the ICU or in the emergency room in acute respiratory failure.

APPLICATION OF NIPPV USING A CRITICAL CARE VENTILATOR

- The first step is to select a ventilator that is capable of fulfilling the needs of the patient.
- Explain the therapy to the patient
- **Choose the appropriate mode**. Usually **pressure support or pressure control modes are preferred**. Standard critical care ventilators using flow by system (non-invasive mode option) allow the patient to breathe without expending effort to open valves. In selected patients like those suffering from neuromuscular diseases, volume assist or volume control mode may be used.
- Choose an appropriate interface
- Silent ventilator alarms
- Keep FiO2 0.5

- **Using pressure support/control approach**
  - **Start with low settings** like inspiratory pressure support at 5-6 cm H2O and PEEP at 2 cm H2O.

- Initiate NIPPV while holding the mask in place and confirm optimum fit. If it is big or small or loose, change it.
- Hold the mask; do not fix the headgear
- **Now increase PEEP till all his inspiratory efforts are able to triggers the ventilator**
- If the patient is making inspiratory effort and the ventilator does not respond to that inspiratory effort, it indicates that the patient has not generated enough respiratory effort to counter auto PEEP and trigger the ventilator (in COPD patients). **Increase PEEP further till this happens**.
- Once the patient's all inspiratory efforts are triggering the ventilator then start increasing pressure support further, keeping certain patient' comfort in mind. (Reduce respiratory rate, reduced use of accessory muscle etc. **Ensure that there are no major leaks.**
- **When there is significant mouth leak, there may be asynchrony. In that case, pressure control will be the preferred mode** of NIPPV and one can set up the inspiratory time to avoid asynchrony.
- After adequate ventilation has been achieved, increase fraction of oxygen concentration to maintain Oxygen saturation more than 90%.
- Secure interface with headgear. It should be tight, but not over-tight. Small leaks are acceptable
- **A peak inspiratory pressure more than 25 cm is rarely required in COPD**, but higher pressures can be used when using NIPPV for other indications. **PEEP is usually titrated between 5-10 cm H2O to** improve triggering and oxygenation.
- **Patient must be monitored very closely clinically**. Look for sensorium, dyspnoea, respiratory rate , respiratory distress, use of accessory muscles, abdominal paradox, **Mask comfort and vital signs pulse** , blood pressure, ECG monitoring and arterial oxygen saturation,
- **All this must be documented every 15 minutes for the first hour** in the clinical notes. Patient will show improvement in parameters if NIPPV is effective. **Arterial blood gas (ABG) sample should be sent after 30mts to 1 hr after the application of NIPPV**.
- In ventilator setting look for air leaks and patient–ventilator interaction.

Monitoring of noninvasive ventilation for acute respiratory failure

Subjective:

- Mask comfort

- Tolerance of ventilator settings
- Respiratory distress
- Physical findings
- Respiratory rate
- **Other vital signs**
    - Accessory muscle use
    - Abdominal paradox
    - Ventilator parameters
    - Air leaking
    - Adequacy of pressure support
    - Adequacy of PEEP
    - Tidal volume (5–7 mL/kg)
    - Patient-ventilator synchrony
- **Gas exchange**
    - Continuous oximetry (until stable)
    - ABGs, baseline and 1–2 h, then as indicated

- Initially **give NIPPV continuously** or as long as possible. Once patient is tolerating periods off NIPPV, start discontinuing during day time and give during nighttime. In two to three days patient can be weaned off from the NIPPV.
- **Additional Points** to remember
    - Neuromuscular blockers should be avoided
    - Deep venous thrombosis prophylaxis,
    - Stress ulcer prophylaxis and
    - nutritional needs should be addressed.

PART II: SOP FOR INVASIVE VENTILATION

INTUBATE AND INITIATE MECHANICAL VENTILATION in following group of patients

- Those who have failed NIV trial.
- Those who have contraindications of NIV
- Excessive secretions
- Hemodynamic instability
- Extreme obesity
- Impending respiratory arrest
- Hypotension
- Altered sensorium: progressive drowsiness, agitation or severe restlessness
- **PCO2> 55 mmHg and Ph < 7.28.** However more than the absolute values the general appearance and degree of distress and fatigue of the patient are important.

Orotracheal intubation: As far a possible a **tube size of 8 or more is employed** and therefore orotracheal route is preferred

Sedation and paralysis: At the time of intubation short acting sedative or anaesthetic such as ketamine, propofol or midazolam and short acting neuromuscular blocking agent (succinylcholine or rocuronium) are used. For maintenance of sedation to assist MV midazolam/ propofol infusion can be used. **Neuromuscular blocking agents should be avoided as infusion** to prevent critical illness neuropathy.

Goals of mechanical ventilation

- Correct hypoxemia-PO2 ~60 mmHg/ SpO2 90%
- Correct hypercapnic-PCO2 ~ 40mmHg
- Reduce work of breathing
- Reversal of respiratory muscle fatigue.

Initial ventilator settings

Setting	**Recommendation**
Respiratory rate	10-15 breaths/rain
Tidal volume	6 - 8-ml/kg (lower TV in
Minute ventilation	ARDS)
PEEP	8-10 l/min
Inspiratory flow	0 cm H2O
I:E ratio	≥100 l/min
FiO2	≥1:3
	1.00

Goals of Ventilation:

- Maintain oxygenation (SpO2 > 90%)
- Reduce work of breathing
- **Minimise auto-PEEP**
- **Accept hypercarbia**, don't increase respiratory rate and tidal volume to reduce PaCO2 if it increases auto-PEEP

Monitor:

- Hypotension is usual after mechanical ventilation due to dehydration,use of sedative and intrinsic PEEP . It should be managed by giving fluid challenge
- Pplat (plateau pressure) reflects PEEPi or dynamic hyperinflation and should be kept < 30 cmH2O. Peak airway pressure reflects only proximal airway pressure and is generally high.

Supportive care:

- **Suctioning:** Maintains airway patency
  Increases oxygenation and decreases work of breathing
  Stimulates cough and prevents atelectasis.
- **Nebulisation**: Inline jet nebulizer / MDI
  Delivery of bronchodilator drugs in aerosolised form.
- **Humidification**: Prevents drying of secretions and maintains mucociliary function.
- **Physiotherapy**: Prevents atelectasis, facilitates postural drainage, and prevents complication of mechanical ventilation.
- **Care of ETT**:
  - Proper fixing of the tube,
  - measuring cuff pressure and
  - maintaining it less than 25 mm of Hg.
- **Nutritional support**:
  - early enteral feeding,
  - provide adequate calories,
  - protein, electrolytes, vitamins and fluids,
  - care of feeding tube.
- **Stress ulcer prevention**:
  - Early enteral feeding,

        - H2 blockers or proton pump inhibitors for prophylaxis,
        - minimise use of steroids and NSAIDS
    - **DVT prevention**: DVT prevention either by
        - low molecular weight heparin or
        - conventional heparin or
        - by graduated compression stockings or
        - sequential compression device in patient where heparin is contraindicated.

Weaning: Weaning is a gradual process, which involves withdrawal of mechanical ventilation and removal of artificial airway. It represents the period of transition from total ventilatory support to spontaneous breathing.

- **Indications for weaning and extubation**:
    - Resolution of disease and its acute phase
    - Patient is able to breathe spontaneously
    - Patient able to oxygenate
    - Patient able to protect the airway

- **Criteria for weaning**
    - Resolution of disease and its acute phase
    - Patient has adequate cough
    - Adequate oxygenation:
        - PaO_2 >60 mm Hg on
        - FiO_2 < 0.5-0.6
        - PEEP < 5-10 cm of H_2O
    - Stable haemodynamics without recent increase pressor requirement.
    - Adequate mentation or no recent deterioration in neurological status.

- **The best way to determine suitability for discontinuation** of mechanical ventilation is to perform spontaneous breathing trial, which can be performed in following ways,
    - **Check respiratory rate and tidal volume** on no pressor- support and calculate **Rapid Shallow Breathing Index (RSBI)** and extubate.
      (RSBI=respiratory rate/tidal volume in L)
        - If **RSBI <105 breaths/min/L** then patient is suitable for extubation
    - A **T-piece trial involves patient to breathing through T piece** for a set period of time (30 min to max 180 min).
      The chances of successful extubation are high if patient passes the T-piece trial.

- **An alternative variant is the use of CPAP** (continuous positive airway pressure) via an endotracheal tube, which overcomes the imposed work of breathing through ETT and prevents airway collapse.

- **Suitability for extubation**:
  - All of the above
  - The patient with adequate cough and gag reflexes.

- **During spontaneous breathing trial (SBT) presence of any of the following amounts to failure of SBT**:
  - **Change in mental status**-somnolence, coma, agitation
  - Onset or **worsening of discomfort**
  - Severe **diaphoresis**
  - Signs of **increased work of breathing**- Use of accessory muscles, thoraco- abdominal paradox.
  - Increase in heart rate >20 bpm or blood pressure > 20 mm of Hg, or any **evidence of haemodynamic instability** or new onset arrhythmias.

  If a patient fails an SBT, then it is important to **look for a reason like occult heart failure, neuromuscular pathology**, etc.

- **Extubation failure**: The use of post-extubation non-invasive ventilators has decreased the use need for re-intubation.

Tracheostomy: Tracheostomies to be considered if mechanical ventilation is expected for more than 7-10 days.

TRANSFER OF VENTILATED PATIENT

- **Purpose** is to maintain oxygenation and to ensure that the patient's clinical condition does not deteriorate during the transfer period for a procedure where portable equipment like CT, MRI is not available or the patient needs to be shifted to another healthcare facility.

- **Required Equipment**
  - Oxygen -Cylinder attached to bed.
  - Ambu bag + Face mask, Pulse oximeter.
  - Monitor (Taken from crash cart)
  - Intubation tray with appropriate size ET tubes.
  - Emergency medications.

- Drugs -Muscle relaxants, sedation.
- Infusions- Inotropes as indicated by patient's condition

- **Procedure**
  - Ensure the necessity of transferring the patient.
  - Consider the destination of the transfer. Ensure the availability of resources at destination.
  - Consider duration of transfer time spent in transit, whether the patient will be returning to the ICU and length of time at destination.
  - Consider patients conditions, is patient's condition stable enough for transfer.
  - Collect all required equipment and personnel.
  - Check all equipment thoroughly.
  - Ensure the staff at destination is ready with all necessary gadgets to receive the patient.
  - Infusion pumps may be transported with the patient on battery power and reconnected to main power supply on reaching destination.
  - While transferring the patient ensures railings are in position.
  - Ensure that the cardiac monitor is easily visible.
  - On reaching destination ensure that patient continues to receive all supportive therapy and monitoring.
  - If patient is returning to the place of origin, stay with the patient, monitor the patient's condition closely.
  - If patient is staying at destination, hand over the patient comprehensively to the assigned nurse of the receiving hospital. Document transfer details in Nurses note.
  - On arriving back at the place of origin all monitoring and artificial ventilation will be resumed.

Appendix 'F'
(Ref VIMS letter no. VIMS/DIM/SOP/2020-1 dated 07 July 2020)

DR VITHALRAO VIKHE-PATIL FOUNDATION'S MEDICAL COLLEGE AND HOSPITAL, VADGAON GUPTA, POST- MIDC, AHMEDNAGAR

DEPARTMENT OF MEDICINE

STANDARD OPERATING PROCEDURE FOR CENTRAL LINE PLACEMENT

Introduction:

This SOP pertains to the task of central (venous) catheter placement and temporary non-tunneled central venous dialysis catheters. The purpose of this standardized operating procedure (SOP) is to help the residents on duty in casualty or ICU to safely place the central catheter when needed. The primary indication for a central catheter is for resuscitation where administration of IV fluids and/or medications by central access is preferable (e.g. hypotension, use of medications requiring central access) or patients who require an IV for treatment but no peripheral access is available. The primary indication for a temporary non-tunnelled central venous dialysis catheter is for pheresis, hemodialysis or renal replacement therapies in critical care patients.

Background Information

- **Competency Assessment**

1. The residents must be instructed on the indications and the details of the procedure and must, in turn, demonstrate that they do understand the indications and the steps of the procedure.
2. Before performing the procedure, the resident must demonstrate knowledge of the following:
    a. Medical indication and contraindications of central or dialysis catheter placement
    b. Risks and benefits of the procedure
    c. Related anatomy and physiology
    d. Consent process
    e. Steps in performing the procedure
    f. Documentation of the procedure
    g. Ability to interpret results and implications in management.

- **Use of Mannequin Simulation:** Simulation Mannequins may be used for practice prior to performing the procedure on patients.

- **Consent:** As far as possible, written informed consent must be obtained from the patient of the next of kin (NOK) prior to the procedure. In case written consent is not possible because of urgency

of the situation, the medical superintendent or consultant in-charge ICU must be informed telephonically.

- **Supervision:** The procedure must be supervised, at least initially, by a competent senior physician. Direct supervision will not be necessary once competency has been established. The resident performing the procedure will notify his/her superior physician immediately upon being involved in any emergency or resuscitative events or under the following circumstances:

  - Patient decompensation or intolerance to the procedure
  - Unexpected resistance is met during catheter placement
  - Bleeding that is not resolved
  - Outcome of the procedure other than expected

Indications:

Central Venous Catheter

- As preferred access in critical patients requiring IV fluids, vasopressors or other medications requiring central access.
- As the only available access for other patients who require IV therapy and medications and peripheral access is not obtainable.

Temporary Non-tunneled Central Venous Dialysis Catheters

- As access in critical care patients requiring pheresis, hemodialysis or renal replacement therapies.

Type of Central Line:

Femoral access is the preferred route for emergent venous line access in most cases. The residents must establish competency in femoral line and Internal Jugular placement and then perform these procedures without direct attending supervision.

Precautions / Contraindications:

- Extra caution should be exercised in patients with **coagulopathies or thrombocytopenia** and correction with blood products prior to line placement should be determined. There is a **risk of hemorrhage, hematoma formation, and pneumothorax** during central line placement.

- A **chest x-ray will be performed immediately** following thoracic central line placement to assure line placement and rule out pneumothorax.

- Additional caution should be exercised in patients requiring femoral vein catheterization **who have had prior arterial surgery**.

Equipment

The following materials may be used during central catheter placement:

1. Chlorhexidine swab
2. Gauze
3. Central line kit (1, 2, 3, 4 lumen central line or introducer) or temporary non-tunneled dialysis catheter kits
4. Opsite or Tegaderm cover dressing
5. Local anesthetic (1% or 2% lidocaine, EMLA cream)
6. Suture material for securing line
7. Scissors and/or scalpel
8. Sterile drape, gown, gloves. Mask, eye protection
9. Sterile flush solution
10. If CVP is to be performed:
    a. Monitor cable for transducing central venous waveform
    b. Pressure I.V. tubing with transducer set up
    c. Pressure bag

Procedure

- **Pre-treatment evaluation:**

  Assess clinical necessity for central or dialysis catheter, coagulation status, and ability of patient to cooperate with procedure. The necessity of the procedure will be determined along with the expected outcomes of the procedure, and the treatment plan.

- **Patient preparation**

  - **Perform a time out** with all appropriate steps. The "time out" represents the final recapitulation and reassurance of accurate patient identity, surgical site, and planned procedure**.**
  - **Position the patient in a comfortable position** that gives adequate access to the placement site (IJ or femoral). For femoral line, patient should be flat. For IJ, in trendelenberg (if patient can tolerate Trendelenberg).
  - If applicable, assure that pressure tubing with transducer is connected to bedside monitor (for CVP).

- **Perform the procedure**

  1. Wash hands
  2. Don sterile gown, mask, gloves, eye protection, mask, and hat. Perform a time out prior to start of the procedure.

3. Cleanse the chosen area with Chlorhexidine solution and allow drying. When applying Chlorhexidine solution, work in a circular motion from proposed insertion site outward.
4. Drape patient appropriately
5. Administer local anesthetic (lidocaine 1%-2%).
6. Prepare central line by flushing all ports with sterile normal saline.

For Femoral Lines

a. **When feasible**, *locate the vein using ultrasound*. Vein will be entered medial to the artery. (Remember: **NAVEL** / **N**erve-**A**rtery-**V**ein-Empty-

   Lymphatic)

b. **Seldinger technique:** Enter the skin with small bore #21 finder needle attached to a syringe. Probe for the desired vein. (Use finder needle first whether or not ultrasound is used.)

c. When the vein is entered and venous blood is readily aspirated, remove needle and syringe and re-enter vein with larger, hollow bore needle.

d. When vein is entered with larger needle and blood is readily aspirated, detach syringe from the needle.

e. **Insert guide wire ("J" wire**) into hub of the needle and thread it through the needle into the vein **as far as possible**, keeping the distal end of the wire visible and accessible at the hub.

f. Remove the needle over the guide wire, holding the guide wire in place.

g. **Make a small nick in the skin of sufficient depth to penetrate the dermis** with the scalpel blade where the wire enters.

h. **Pass the dilator over the guide wire**, using a twisting motion to pass through resistance at the skin. **Pass the dilator 2-3" only. (It is not necessary to advance to the hub; you are only trying to dilate the skin and subcutaneous tissue.)**

i. **Remove the dilator over the wire**, keeping the wire in place.

j. **Pass the IV catheter over the wire and advance it up to the hub**, allowing distal end of guide wire to pass through one of the ports of the catheter.

k. **Remove the guide wire**.

l. **Confirm placement by aspirating blood from all ports**.

- **Flush ports with sterile normal saline** and clamp.
- **Secure central line** with a non-absorbable suture
- **Clean site and apply sterile transparent dressing** (Opsite, Tegaderm)
- **Dispose the sharps** off and used materials appropriately.
- **Order a chest x-ray immediately** following thoracic central catheter placement to assure catheter placement and to **rule out pneumothorax**.

m. Address post-procedural analgesics as needed.

Documentation

A. Written record must reflect

- The indications for central or dialysis catheter insertion,
- Consent,
- Medications administered,
- Events of procedure,
- The time out,
- How the procedure was tolerated,
- Confirmation of placement by chest-x-ray and the radiologist

B. Documentation is in the electronic medical record

- Documentation of the pretreatment evaluation
- Record the time out, procedure, EBL, the outcome, patient tolerance, medications given, and the plan in the note, as well as any teaching and discharge instructions.

B. **All abnormal or unexpected findings must be reviewed** with the supervising physician.

Appendix 'G'
(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

ACUTE CHEST PAIN

The Acute Coronary Syndromes protocol outlines the steps for assessment and management of a patient with ACS. The algorithm begins with the assessment of chest pain and whether it is indicative of ischemia. The assessment and management begin with the EMS responder outside of the hospital who can, initiate care. An initial 12-lead ECG can also be obtained early in the assessment of the patient which will help to determine the appropriate destination facility. Treatment and assessment continue when the patient arrives at the hospital, following the time sequences suggested in the algorithm.

Immediate Management

Within the first 10 minutes that the patient is in the emergency department (ED), work through the following:

1. Check vital signs.
2. Evaluate oxygen saturation. If less than 94% or the patient is short of breath, administer oxygen as needed to increase oxygen saturation to between 94 and 99%.
3. Establish IV access.
4. Obtain or review a 12-lead ECG (if not established in the field).
5. Look for risk factors for ACS, cardiac history, signs and symptoms of heart failure by taking a brief, targeted history.
6. Perform a physical exam.
7. Obtain a portable x-ray (less than 30 minutes).

Begin **general treatment** in the ED:

1. If the patient did not receive aspirin from the EMS provider, give aspirin (160 to 325 mg).
2. Administer nitroglycerin 0.4mg q 5 minutes, either tablet or sublingual spray. Withhold nitroglycerin on the patient who is experiencing right ventricular infarction or hypotension.
3. Give the patient a narcotic pain reliever such as fentanyl, morphine or dilaudid if pain is not relieved by nitroglycerin. Morphine is the drug of choice for infarction, but should be used with caution in the unstable angina patient.

Decision 2: Classify the patient according to presentation of ST-segment.
The 12-lead ECG is at the heart of the decision pathway in the management of ischemic chest pain and is the only means of identifying STEMI.
Note: The ECG classification of ischemic syndromes is not meant to be exclusive.

STEMI (ST-segment elevation myocardial infarction) **Classification**: Infarction

Definition: ST segment elevation greater than 1 mm (0.1 mV) in 2 or more contiguous precordial leads or 2 or more adjacent limb leads **-OR-** New or presumed new left bundle branch block

High-risk unstable angina (UA) or NSTEMI (non-ST-segment elevation myocardial infarction) **Classification**: Ischemia

Definition: Ischemic ST-segment depression of 0.5 mm (0.5 mV) or greater **–OR-** Dynamic T wave inversion with pain or discomfort / Transient ST elevation of 0.5 mm or greater for less than 20 minutes

Intermediate or low risk UA Classification: Normal? (Needs further work-up)

Definition: Normal or non-diagnostic changes in ST segment or T wave that are inconclusive and require further risk stratification / Includes people with normal ECGs and those who have ST-segment deviation in either direction that is less than 0.5 mm or T wave inversion of 2 mm or 0.2 mV or less
Management is based on the results of the ECG.
ECG shows ST-segment elevation.
Confirm how much time has passed since the onset of symptoms.
If less than 12 hours has elapsed, do the following:

- **Develop a reperfusion strategy** based on the patient's and the hospital's criteria. Unless impossible, the patient should be taken to the cardiac catheterization laboratory for PCI. Results of cardiac markers, chest x-ray, and laboratory studies should not delay reperfusion therapy unless there is a clinical reason

  Continue **adjunctive therapies**.

- If indicated, add the following treatments:

  - **ACE inhibitors**/angiotensin receptor blocker (ARB) within 24 hours of symptom onset
  - **HMG-CoA reductase inhibitor** (statin therapy)
  - **Beta-adrenergic receptor blocker**
  - **Clopidogrel**
  - **Heparin** (unfractionated heparin or low-molecular-weight heparin / UFH or LMWH)

***If the patient is classified with NSTEMI or high-risk unstable angina, follow this section of the algorithm*.**

Decision 2: Classify the patient according to presentation of ST-segment.

ECG shows ST depression or dynamic T-wave inversion

Start adjunctive treatments for NSTEMI, as indicated:

- Nitroglycerin
- Beta-adrenergic receptor blocker
- Clopidogrel
- Heparin (UFH or LMWH)
- Consider Glycoprotein IIb/IIIa inhibitor (in consultation with cardiologist)

If more than 12 **hours have passed** since the patient's onset of symptoms, do the following:

- Admit patient to the hospital
- Assess risk status
- Continue ASA, heparin, and other therapies as indicated (ACE inhibitors, statins) for the high-risk patient characterized by:
    - Refractory ischemic chest pain
    - Recurrent or persistent ST deviation
    - Ventricular tachycardia
    - Hemodynamic instability
    - Signs of pump failure

ECG shows normal ECG or nonspecific ST-T wave change

Consider admitting the patient to hospital or to a monitored bed in ED

Date: July 2020

Place: Ahmednagar (Maharashtra)

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Appendix 'H'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

SOP FOR MANAGEMENT OF ACUTE SEVERE ASTHMA

Bronchial asthma is a chronic inflammatory disease of airways. Asthma usually manifests with episodes of cough, wheeze and dyspnoea. Severe life-threatening obstruction is known as acute severe asthma. In unusual circumstances, acute episodes can cause death.

DIFFERENTIAL DIAGNOSIS- following conditions must be differentiated from Ac Severe Asthma.

1. Acute infective exacerbation of COPD.
2. Pulmonary Edema
3. Upper Respiratory Tract Obstruction
4. Pulmonary Embolism
5. Anaphylaxis

ASSESSMENT OF SEVERITY OF ACUTE ASTHMATIC ATTACK

Features of acute severe asthma:

- Peak expiratory flow (PEF) 33–50% of best (use % predicted if recent best unknown).
- Can't complete sentences in one breath.
- Respiration >25breaths/minute.
- Pulse >110beats/minute.

Life-threatening features:

- PEF <33% of best or predicted.
- SpO_2 <92%
- Silent chest, cyanosis or feeble respiratory effort.
- Arrhythmia or hypotension.
- Exhaustion, altered consciousness.

If patient has any life-threatening feature:

Measure arterial blood gases. No other investigations are needed for immediate management.

Blood gas markers of a life-threatening attack:

- Normal (4.6–6kPa, 35–45mmHg) $PaCO_2$
- Severe hypoxia: PaO_2 <8kPa (60mmHg) irrespective of treatment with oxygen.
- A low pH (or high H^+).

Caution: *Patients with severe or life-threatening attacks may not be distressed and may not have all these abnormalities. The presence of any should alert the doctor.*

Near fatal asthma:

- Raised $PaCO_2$
- Requiring mechanical ventilation with raised inflation pressures.
- Feeble respiratory effort
- Cyanosis
- Silent chest
- Exhaustion, confusion or coma
- Bradycardia or hypotension
- Peak Flow Rate < 33% of predicted or best

INVESTIGATIONS-

1. ECG (to exclude acute Cor pulmonale)
2. Chest X-ray PA (to exclude pneumothorax)
3. Peak Flow Rate
4. Electrolyte and ABG panel.

TREATMENT

IMMEDIATE MANAGEMENT

- Oxygen to maintain SpO_2 94–98%. (CO_2 retention is not usually aggravated by oxygen therapy in asthma).
- **Salbutamol 5mg or terbutaline 10mg via an oxygen-driven nebuliser.**
- **Ipratropium bromide 0.5mg via an oxygen-driven nebuliser.**
- **Prednisolone oral 40–50mg or hydrocortisone IV 100mg if unable to take oral.**
- No sedatives of any kind.
- Repeat chest radiograph only if pneumothorax or consolidation are suspected or patient requires mechanical ventilation.

IF LIFE-THREATENING FEATURES ARE PRESENT:

- Discuss with senior clinician and ICU team.
- **Consider IV magnesium sulphate 1.2–2g infusion over 20 minutes (unless already given).**
- **Give nebulised $beta_2$ agonist more frequently e.g. salbutamol 5mg up to every 15–30 minutes or (if special nebuliser available for continuous nebulisation) 10mg/hour.**

↓

SUBSEQUENT MANAGEMENT

IF PATIENT IS IMPROVING CONTINUE:

- Oxygen to maintain SpO_2 94–98%.
- **Prednisolone oral 40–50mg each day or hydrocortisone IV 100mg 6 hourly.**
- **Nebulised $beta_2$ agonist and ipratropium 4–6 hourly.**

IF PATIENT NOT IMPROVING AFTER 15–30 MINUTES:

- Continue oxygen and steroids.
- **Use continuous nebulisation of salbutamol at 5-10mg/hour if special nebuliser is available. Otherwise give nebulised salbutamol 5mg every 15–30 minutes.**
- **Continue ipratropium 0.5mg 4–6 hourly until patient is improving.**

IF PATIENT IS STILL NOT IMPROVING:

- Discuss patient with senior clinician and ICU team.
- **Consider IV magnesium sulphate 1.2–2g over 20 minutes (unless already given).**
- **Senior clinician may consider use of IV salbutamol or IV aminophylline or progression to mechanical ventilation.**

↓

MONITORING:

- Repeat measurement of PEF 15–30 minutes after starting treatment.
- Oximetry: maintain SpO_2 94–98%.
- Repeat blood gas measurements within 1 hour of starting treatment if:
  - initial PaO_2 <8kpa (60mmHg) unless subsequent SpO_2 >92% or
  - $PaCO_2$ normal or raised or
  - patient deteriorates.
- Chart PEF before and after giving $beta_2$ agonists and 4 times daily during hospital stay.[#]

Transfer to ICU accompanied by doctor prepared to intubate if:

- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnia.
- Exhaustion, altered consciousness
- Poor respiratory effort or respiratory arrest.

Date: July 2020

Place: Ahmednagar (Maharashtra)

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Appendix 'I'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

SOP FOR MANAGEMENT OF COMATOSE PATIENT

INTRODUCTION

Coma is a state of unrousable unresponsiveness. Coma can be caused by a number of etiological factors, ranging from head trauma to metabolic disorders. However, initial management of a coma case remains more or less same. This SOP lays down general guidelines for management of a coma case in emergency rooms.

CAUSES OF COMA

Metabolic:

1. **Drugs, poisoning,** (carbon monoxide, alcohol)
2. Hypoglycemia, Hyperglycemia (Ketoacidotic, or HONK),
3. Hypoxia, CO2 narcosis (COPD),
4. Septicemia,
5. Hypothermia,
6. Myxedema, Addisonian crisis,
7. Hepatic/Uremic Encephalopathy

Neurological:

1. Trauma,
2. **Infections**, **meningitis**, encephalitis, eg Herpes simplex, **malaria**, Enteric fever, rabies, trypanosomiasis,
3. **Tumor**, cerebral/meningeal tumor.
4. **Vascular: Subdural/subarachnoid hemorrhage, stroke, Hypertensive Encephlopathy**
5. **Epilepsy:** Non-convulsive status or post- ictal state.

IMMEDIAT MANAGEMENT

- ✓ **Assess airway, breathing and circulation**. Consider intubation if GCS <8. Support the circulation if required (ie IV fluids). Give Oxygen and treat any seizure.
- ✓ **Protect the cervical spine**.
- ✓ Give **50 ml dextrose IV** immediately. Check blood glucose at bedside in all patients before giving dextrose.

Emergent evaluation and management of stupor and coma in adults

Evaluation
Vital signs and general examination
Neurologic examination and GCS
Screening laboratories (CBC, glucose, electrolytes, BUN, creatinine, PT, PTT, ABG, LFTs, drug screen)
ECG
Head CT scan: prioritize emergent if focal neurologic signs, papilledema, fever
Lumbar puncture: prioritize emergent after CT scan if fever, elevated WBC, meningismus; otherwise do according to level of suspicion for diagnosis or if cause remains obscure
EEG: for possible nonconvulsive seizure, or if diagnosis remains obscure
Other laboratory tests: blood cultures, adrenal and thyroid tests, coagulation tests, carboxyhemoglobin, specific drug concentrations – do according to level of suspicion for diagnosis or if cause remains obscure
Brain MRI with DWI, if cause remains obscure
Management
ABCs:
Intubate if GCS ≤8
Stabilize cervical spine
Supplement O_2
IV access
Blood pressure support as needed
Glucose 50 percent IV 50 mL (after blood drawn, before results back)
Thiamine 100 mg IV
Treat definite seizures with phenytoin or equivalent
Consider empiric treatments:
For possible infection:
Ceftriaxone and vancomycin
Acyclovir
For possible ingestion:
Naloxone
Flumazenil
Gastric lavage/activated charcoal
For possible increased ICP:
Mannitol
For possible nonconvulsive status:
Lorazepam
Phenytoin or equivalent

GCS: Glasgow Coma Scale; CBC: complete blood count; BUN: blood urea nitrogen; PT: prothrombin time; PTT: partial thromboplastin time; ABG: arterial blood gas; LFT: liver function tests; ECG: electrocardiogram; CT: computed tomography; WBC: white blood cells; EEG: electroencephalography; MRI: magnetic resonance imaging; DWI: diffusion weighted imaging; IV: intravenous; ICP: intracranial pressure.

- ✓ **Inj Thiamine 200 mg IV** if the patient is an alcoholic or if there is evidence of Wernicke's encepholopathy.
- ✓ **IV naloxone 0.5 – 2.0 mg** for opiate intoxication (may also be given IM or via ET tube).
- ✓ **IV flumazanil 200 mcg repeat 100 mcg after 60 sec** for benzodiazapene intoxication if breathing compromised.

ASSESMENT

The diagnosis may be clear, e.g. hyperglycemia, hypoglycemia, alcohol excess, drug poisoning or overdose, uraemia, pneumonia and hypertensive or hepatic encephalo-pathy. If there are localizing CNS signs and no history of trauma and there is no fever the diagnosis is only probably stroke. In all undiagnosed coma patient or in those with focal neurological signs, a CT scan of head is very helpful. A lumbar puncture may be needed for meningitis or subarachnoid haemorrhage.

APPROACH TO A COMA CASE

ABC of life support
↓
Oxygen, IV line
↓
Stabilize Cervical Spine
↓
Blood Glucose and 50% Dextrose 50 ml IV
↓
Control Seizures (if present)
↓
Consider Thiamine, Naloxone, Flumazenil
↓
Quick History & Brief Examination
↓
Investigations
(FBC, Metabolic Parameters, Electrolytes)
CXR, CT Head, CSF Analysis
Cultures, Blood MP
↓
Reassess & Plan further action

Date: July 2020

Place: Ahmednagar (Maharashtra)

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Appendix 'J'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

SOP FOR MANAGEMENT OF POISINING CASES

INTRODUCTION

1. This SOP applies to all cases of suicidal, homicidal or accidental poisoning by oral, parenteral, inhalation, or skin exposure routes.
2. All cases of suspected poisoning are to be treated as medico-legal cases.

NATURE OF POISON

3. As far as possible, the nature of poison will be ascertained by history, clinical findings and examination of alleged poisonous substance. Common poisoning can be divided into following groups-

(a) Sympathomimetic syndrome: Pulse & BP elevated, temp elevated, pupils dilated. Skin sweaty though mucous membranes may be dry. Patient may be agitated e.g. Amphetamine, Cocaine, Bronchdilators, Theophylline etc.

(b) **Sympatholytic syndrome:** Pulse, BP & temp low. Pupils small. Patient obtunded. Peristalsis decreased e.g. TC Antidepressants, Antihistaminics , Alpha and Beta Adrenergic blockers.

(c) Cholinergic Syndrome: Bradycardia, miosis, sweating, hyperperistalsis and bronchorrhoea. Eg Carbamates, Nicotine, Organophophates etc**.**

(d) Anticholinergic syndrome: Pulse & BP elevated, temp elevated, pupils widly dilated, skin hot, flushed and dry. Peristalsis decreased, urinary retention. Delirium e.g. Atropine, Scopolamine, Antihistaminics, Tricyclic Antidepresants, Belladona alkaloids.

(d) Corrosives: Coagulative or liquifactive necrosis of mucosal surfaces turning lips, buccal mucosa, tongue and oropharynx white. Severe pain in throat, chest and epigastrium. Excessive salivation, e.g. Acid and Alkali poisoning**.**

MANAGEMENT

Risk Assessment The aim is to determine if the ingestion/ contact is potentially harmful and to develop a management plan.

NPIC The Poisons Information Centre may provide useful information about product ingredients and potential toxicity. **One can phone National Poisoning Information Centre (NPIC), AIIMS New Delhi on 011 26589391, 011 26593677, Toll free number: 1800116117**. The Toxicologists are available 24x7 to provide specific clinical advice and require the following clinical information:

Agent: (drug / substance, name and formulation - immediate or modified release)
Beware of the possibility of mixed overdose
Route - ingested, inhaled, topical exposure
Time of incident
Dose/ kg
Maximum amount of ingestion (include all medication that was potentially in the bottle or packet when calculating).
Beware of the possibility of inaccurate dose reporting on history taking.
Weight of child
Symptoms
Signs
If mixed or undetermined ingestion paracetamol level should be done.

Resuscitation/Emergency Management

A. Airway
Inability to protect airway may be with >GCS8 in poisonings. AVPU may be a more useful descriptor of conscious state.
Caustic ingestions

B. Breathing

C. Circulation

Dysrhythmias are frequently due to **sodium channel blockade** and may be treated with Sodium Bicarbonate.
Alternately they may be caused by **potassium channel blockade** - treated with magnesium sulphate (MgS04)

D1. Disability

Seizures - those due to poisoning are always generalized. Usually respond to benzodiazepines with barbiturates second line. ***Phenytoin is not recommended*** (as this is usually ineffective).
Consideration should be given to drug induced syndromes - malignant hyperthermia, serotonin syndrome and neuroleptic malignant syndrome
Check glucose level: treat if glucose <4mmol/L (link hypoglycaemia)

D2. Decontamination

Eye Copious irrigation with saline. Instillation of local anaesthetic eye drops and sedation may be required.

Skin Remove clothes, rinse with copious water, then soap and water

Gastrointestinal A variety of methods may be considered and should be discussed with a toxicologist before commencement as all require a risk / benefit analysis. ***Emesis has no role in the hospital setting***

Activated Charcoal has a very limited role in treatment and should not be used without consultation with a toxicologist, unless presents less than 1 hour after a potentially toxic ingestion with normal conscious state. *Paediatric deaths have occurred from activated charcoal*.

Contraindications:
Patients with altered conscious state
Ethanol/glycols
Alkalis / corrosives
Metals - including Lithium, Iron compounds, potassium
Fluoride
Cyanide
Hydrocarbons
Mineral acids - Boric acid

Gastric Lavage has a very limited role in treatment should not be performed *unless the patient presents within one hour of poison ingestion and there is no contraindication like corrosive ingestion*. It requires intubation for airway protection and should not be used without consultation.

Whole Bowel Irrigation has a limited role in treatment of life-threatening ingestions of *some slow release preparations and agents that do not bind to activated charcoal*.

D3 Drug antidotes (see specific guidelines) Specific antidotes may be available as part of a management plan. Serum drug concentrations may help in treatment decisions.

Poisoning	**Antidote**
Anticholinergic syndrome	Physostigmine
Benzodiazepines	Flumazenil
Beta Blocker	Glucagon
Calcium channel blocker	Calcium/insulin+glucose/Intralipid®
Cyanide	Hydroxocobalamin/ Dicobalt edetate/ Sodium thiosulphate
Digoxin	Digoxin immune Fab (Digibind)
Ethylene glycol	Ethanol/ Pyridoxine
Iron	Desferrioxamine
Isoniazid	Pyridoxine
Local anaesthetics	Intralipid®
Methaemoglobinaemia	Methylene Blue

Methanol	Ethanol
Opiates	Naloxone
Oral hypoglycaemics	Octreotide
Organophosphate	Atropine
Paracetamol	N-Acetyl Cysteine
Organophosphates	Pralidoxime, Atropine
Quinine induced hypoglycaemia	Octreotide
Tricyclic antidepressants	Sodium bicarbonate
Warfarin, rodenticide anticoagulant	Vitamin K
Snake Venom	Specific or polyvalent snake Anti-venom

E1 ECG

E2 Exposure Hyper/ hypothermia - >38.5°C requires urgent cooling

E3 Enhanced elimination

Urinary alkalization (Useful for salicylate toxicity if performed meticulously)

Multi dose activated charcoal (whilst there is evidence of a pharmacokinetic effect, it is not evident that it improves clinical outcome.)

Dialysis

Intermittent High flux haemodialysis removes small water-soluble toxins

Salicylate,
Toxic Alcohols
Lithium
Theophylline
Valproate
Barbiturates
Methotrexate

Continuous renal replacement such as veno-veno haemofiltration has a low clearance rate and is only suitable where haemodialysis is not tolerated. Other methods such as peritoneal dialysis, charcoal haemoperfusion, exchange transfusion and plasmapheresis are less effective.

Date: July 2020

Place: Ahmednagar (Maharashtra)

(Brig Arun Tyagi, SM (Retd)
Prof and HOD
Department of Medicine
DVVPF's Medical College

Appendix 'K'

(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

SOP FOR MANAGEMENT OF SNAKE BITE

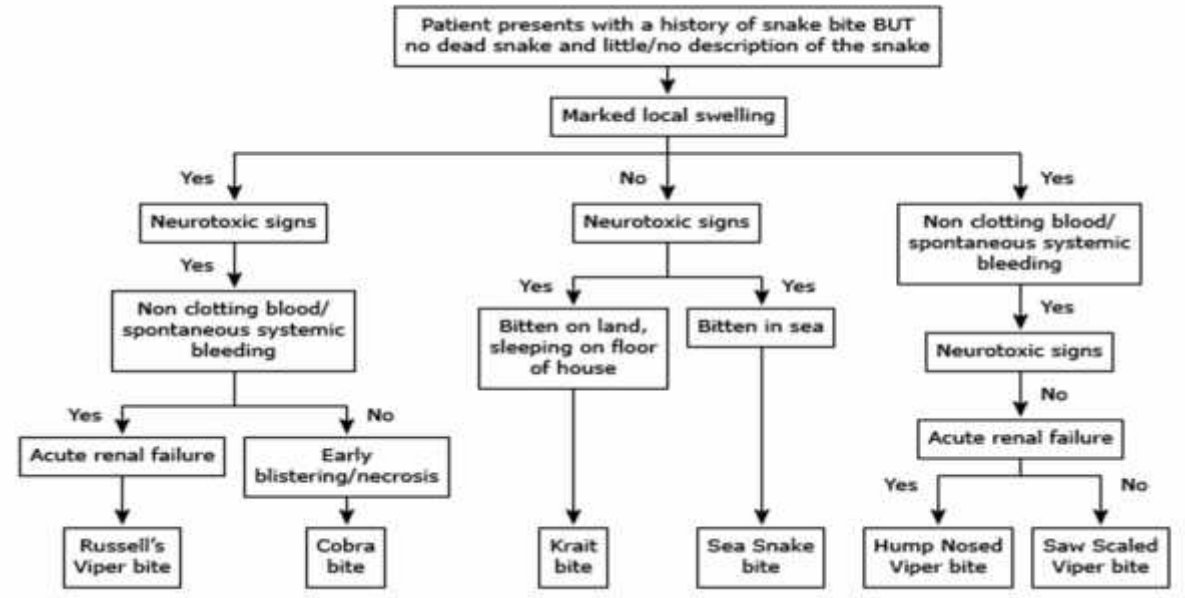
There are about 3000 species of snakes all over the world; out of these 216 are found in India. Of these 15% are poisonous. In India, the poisonous snake belong to C*rotalidae, Elapidae, Viperidae, Hydrophiodae* and *Colubridae* families. The common poisonous snakes in India are King Cobra, Common Cobra, Krait, Russell's viper, Saw-Scaled Viper and the sea snakes.

MANAGEMENT

When faced with a case of snake bite, ascertain the following-

1. **HAS THERE BEEN A BITE?**
2. **IS THE BITE POISONOUS OR NON POISNOUS?** Examine the part carefully for fang marks. Use a magnifying glass if required.
3. **IS THERE ANY SIGN OF ENVENOMATION?** Look for local edema, induration, discolouration, oozing. Examine for ptosis, diplopia, respiratory distress, cyanosis, nasal regurgitation of fluids and for muscle tenderness. Ask for Clotting time, Prothrombin time, urine for RBCs/myoglobin,
4. **IS ANTI-SNAKE VENOM (ASV) INDICATED?** If the case is of poisonous snake bite and envenomation is present, ASV, in adequate dose, must be administered as quickly as possible. ASV is the only definitive treatment and may be life-saving.

Algorithm for diagnosis of the snakebite



FIRST AID-

- ✓ Reassure the patient
- ✓ Clean Local Area
- ✓ Immobilise Part
- ✓ Establish Intravenous Line
- ✓ Collect blood sample if facility exists

ANTISNAKE VENOM- ASV should be administered intravenously, dissolved in 100 ml of 5% Dextrose in water. The ASV is started slowly, watching closely for signs of reaction/anaphylaxis. If no reaction is noted after 15 – 20 min, give full dose in one hour. ASV can be repeated every 2 – 6 h till toxicity disappears.

Premedication

Inj Hydrocortisone 100 mg IV
Inj Chlorpheniramine maleate 25 mg or Phenergan 25 mg IV
Inj Adrenalin must be loaded in a syringe and must be available at hand

DOSE OF SNAKE ANTIVENOM

1. **Local Envenomation** 50ml.
2. **Systemic Envenomation** 100 - 200 ml**.**

Date: July 2020

Place: Ahmednagar (Maharashtra)

(Brig Arun Tyagi, SM (Retd)
Prof and HOD
Department of Medicine
DVVPF's Medical College

Appendix 'L'

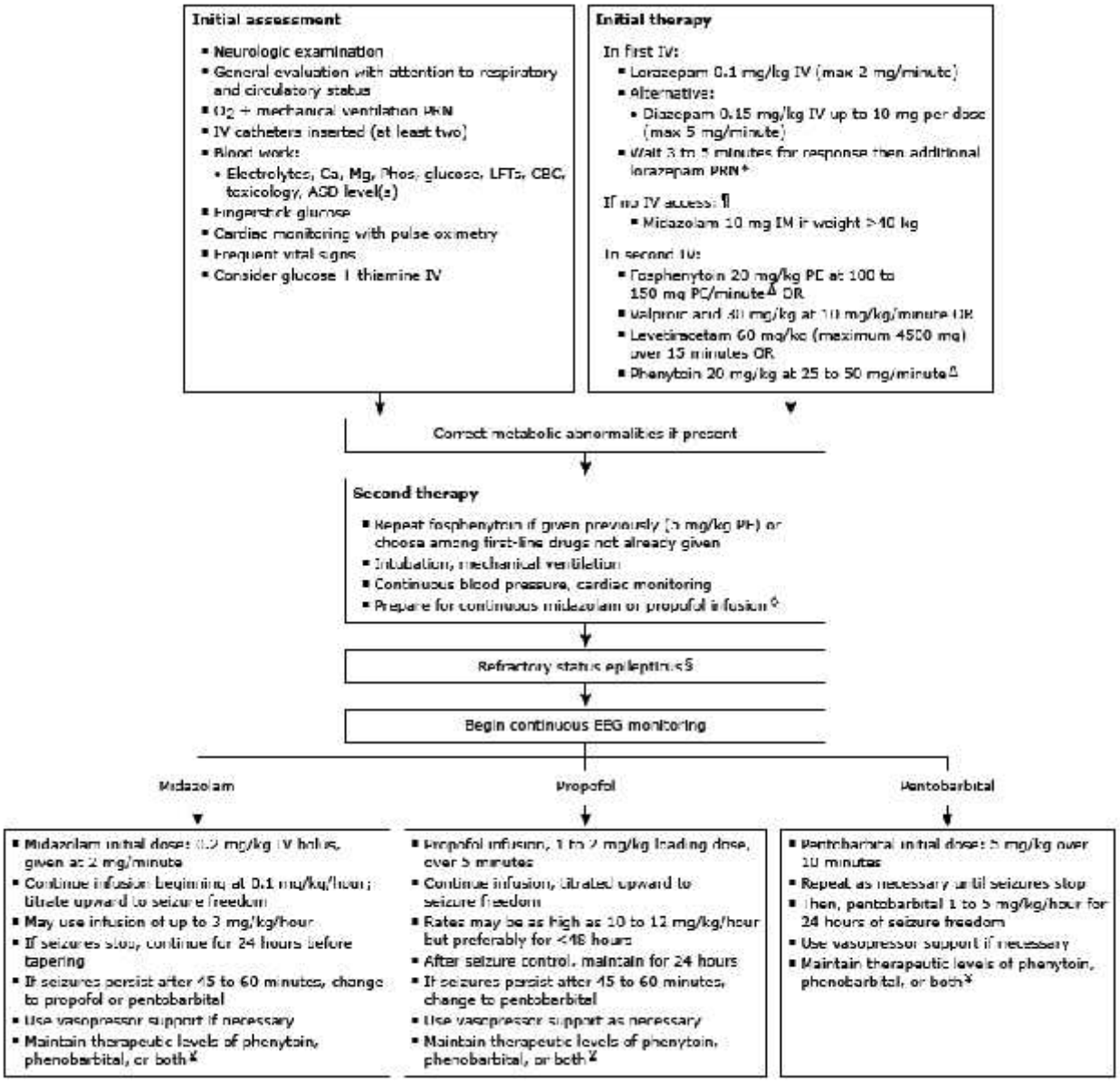
(Ref VIMS letter no. VIMS/DIM/SOP/2020-01 dated 07 July 2020)

DVVPF'S MEDICAL COLLEGE AND HOSPITAL, AHMEDNAGAR

STANDARD OPERATING PROCEDURE

MANAGEMENT OF STATUS EPILEPTICUS

Status epilepticus is a medical emergency that carries high mortality & morbidity. Irreversible brain damage is possible if status is not controlled within 30 minutes. It is defined as 1. Continuous clinical &/or electrical seizures for more than 30 min. or 2. Two or more seizures without patient regaining consciousness.



Management (Simplified Algorithm)
Aim is to terminate status at the earliest. Irreversible brain damage starts after 20-30 min of seizure activity.

Initial Care (ideally done in first five minutes)

- Insert airway
- Clear oropharyngeal secretions
- Monitor pulse, BP & respiration
- O2 administration (if needed)
- IV line
- Blood for metabolic screening
- 50% glucose 50 ml IV (2 ml/kg for kids)
- Thiamine 100 mg IV *stat*
- Monitor ECG

Termination of Status- *POINTS TO REMEMBER*

- **First & only aim: stop convulsions**
- Investigate after termination of seizures
- If seizure is still on by the time injection is ready; start treatment
- Give full permissible dose of AED
- Inj Diazepam 10 mg @ 02mg/min IV (watch for respiratory depression)

  or
- Inj Lorazepam 0.75 mg/kg @ 2 mg/min IV/IM

  or
- Inj Midazolam IV/IM/per rectum @ Loading dose 0.2 mg/kg
  (Maintenance dose 0.12 – 0.4 mg/kg/h)

FOLLOWED BY

Inj Diphenylhydantoin Sodium 20 mg/kg @ <50 mg/min (do not dilute in 5% DW)

or

Inj Fosphenytoin sodium 20mg/kg @ <150 mg/min

- Send call for physician
- Shift the patient to ICU

Date: July 2020

Place: Ahmednagar (Maharashtra)

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