NATIONALMEDICALCOMMISSION

Post graduate Medical Education Board

D11011/1/22/AC/Guidelines/Human Anatomy **Date:05-08-2022**

GUIDELINES FOR COMPETENCYBASED POSTGRADUATE TRAININGPROGRAMME FOR MD IN HUMANAN ANATOMY

GUIDELINESFORCOMPETENCYBASEDPOSTGRADUATET RAINING PROGRAMMEFORMD INHUMANANATOMY

Implementation of Revised Competency Based Post Graduate Training Programme for MD in Human Anatomy as per the guidelines prepared by the National Medical Commission through Subject Expert Groups{ Date of Bos 21.07.2022 Ref :SBKSMIRC/Dean/Outward No.1301/2021-22, Date of Academic council :29.07.2022 Ref :SVDU/NOTFN/O370/2021-22 dated 30.07.2022}

Preamble

ThepurposeofPGeducationistocreatespecialistswhowouldprovidehighqualityhealthcare and advance the cause of science throughresearch&training.

These guidelines would help to achieve a uniform level of training of postgraduates in MDAnatomy throughout the country. The student, after undergoing the training, should be able todeal effectively with the needs of the medical community and should be competent to handleall problems related to the specialty of Anatomy and recent advances in the subject. Thepostgraduate student should also acquire skills in teaching anatomy to medical and para-medical students and be able to integrate teaching of Anatomy with other relevant subjects,whilebeingawareofher/hislimitations.

The purpose of this document is to provide teachers and learners comprehensive guidelines toachieve defined outcomes through learning and assessment. This document has been preparedby subject-content specialists of the National Medical Commission. The Expert Group of theNational Medical Commission had attempted to render uniformity without compromise to thepurpose and content of the document. Compromise in purity of syntax has been made in orderto preserve the purpose and content. This has necessitated retention of “domains of learning”undertheheading“competencies.

SUBJECTSPECIFICLEARNINGOBJECTIVES

The**Goal**ofMDAnatomyistotrainadoctortobecomeacompetentteacherandresearcherinAnatomy whohas acquiredcompetence /skillsin:

1. contemporaryadvancesanddevelopmentsinthefieldofAnatomy.
2. competenciespertainingtothesubjectofAnatomythatarerequiredtobepracticedatallle vels ofthe healthsystem.

3. educating medicalandparamedicalprofessionals.
4. effectivelycommunicatingwiththestudentsandcolleaguesfromvariousmedicalandparamedicalfields.
5. integratinganatomywithother disciplinesasandwhenneeded.
6. beinggoodteacher capableofinnovationsinteachingmethodology**.**
7. beingeffectiveleaderoftheteamengagedinteachingandresearch.

AftercompletingthethreeyearcourseinMDinHumanAnatomy,thestudentshouldhaveachievedcompetenceinthefollowing:

1. KnowledgeofAnatomy

1.1 Acquire competencies in gross anatomy, surface anatomy, neuroanatomy, embryology,genetics,histology,radiologicalanatomy,appliedaspectsandrecentadvancesofthe abovementionedbranchesofanatomytoclinicalpractice.Thesearegivenindetailinsubsequent sections.

2. PracticalandProceduralskills

2.1 Acquire mastery in dissection skills, embalming, tissue processing, staining and museumpreparation/techniques,bone procurementanditstissuepreparation.

3. AcquiretrainingskillsinResearchMethodology

3.1 Acquireskillsinteaching,researchmethodology,epidemiology&basicinformationtechnology.

3.2 Acquireknowledgeinthebasicaspectsof Biostatisticsandresearchmethodology.

3.3 Has knowledge to plan the protocol of a thesis, carry out review of literature, execution ofresearchprojects andpreparationofreports.

3.4 Hasabilitytousecomputerapplications,Microsoftoffice(Microsoftword,excel,powerpoint),Internet,Searchingscientificdatabases(e.g.PubMed,Medline,Cochranereviews).

3.5 Acquire skills in paper&posterpreparation, writing resear chpapersandthesis.

4. Professionalism,attitudeandcommunicationskills:

4.1 Develop work ethicsandempatheticbehaviorwithstudentsandcolleagues.

4.2 Acquirecapacityofnotlettinghis/herpersonalbeliefs,prejudices,andlimitationscomeinthewayofduty.

4.3 Acquireattitudeandcommunicationskillstointeractwithcolleagues,teachers,andstudents,bodydonors and family members of the donors

5. TeachingAnatomy

5.1 Acquireskillsinteachingundergraduatestudents,(Lecture,SmallGroupDiscussion,SDL,assessmentandfeedback.

5.2 Makingpowerpointpresentationofsubjecttopics.

6. Problemsolving:Thepostgraduatestudentsshouldbeabletodemonstratetheabilityto:

6.1 Identifyappliedimplicationsoftheknowledgeofanatomyanddiscussinformationrelevanttothe problem,usingconsultation,texts,archivalliteratureandelectronicmedia.

6.2 Correlate the clinical conditions to the anatomical / embryological / hereditary factors andexplainanatomicalbasis ofdiseases.

6.3 Evaluatescientific/clinicalinformationandcriticallyanalyzeconflictingdataandhypotheses.

6.4 Prepare Scenario-based MCQs.

SUBJECT SPECIFIC COMPETENCIES

Attheendofthecourse,thestudentshouldhaveacquiredcompetencieswithfollowingpredominantdomains:

A. PredominantinCognitivedomain:

1. Describe gross anatomy of the entire body (including upper limb, lower limb, thorax,abdomen,head&neckandbrain).
2. Explain the normal disposition of gross structure, and their interrelationship in thehuman body. She / He should be able to analyze the integrated functions of organssystemsandlocatethesite ofgrosslesionsaccordingtodeficitsencountered.
3. Describetheprocessofgametogenesis,fertilization,implantationandplacentaformation in early human embryonic development along with its variation and appliedanatomy.
4. Demonstrateknowledgeaboutthesequentialdevelopmentoforgansandsystemsalongwith their clinical anatomy, recognize critical stages of development and effects ofcommon teratogens, genetic mutations and environmental hazards. She / He should beable toexplaindevelopmentalbasisofvariationsandcongenitalanomalies.
5. Explaintheprinciplesoflight,transmissionandscanning,compound,electron,fluorescentandvirtualmicroscopy.
6. Describe the microscopic structure of various tissues & organs and correlate structurewith functions as a prerequisite for understanding the altered state in various

diseaseprocesses.

7. Demonstrateknowledgeaboutcellanditscomponents,cellcycle,cellulardifferentiationan dproliferation.
8. Describe structure, number, classification, abnormalities and syndromes related tohumanchromosomes.
9. Describeimportantproceduresincytogeneticsandmoleculargeneticswithitsapplication.
10. Demonstrateknowledgeaboutsinglegenepatterninheritance,intermediatepatternandmult iplealleles,mutations,non-Mendelianinheritance,mitochondrial inheritance,genomeimprintingandparentaldisomy.
11. Describe multifactorial pattern of inheritance, teratology, structure gene, molecularscreening,cancergenetics andpharmacogenetics.
12. Explaintheconceptofreproductiongenetics, infertility,assistedreproduction,prenataldiagnosis,genetic counselingandethicsingenetics.
13. Explainprinciplesofgenetherapyanditsappliedknowledge.
14. Describe the immune system and cell types involved in defense mechanisms of thebody.Explainthegrossfeatures,cytoarchitecture,function,developmentandhistogenes isofvariousprimaryandsecondarylymphoidorgansinthe body.
15. Demonstrate knowledge about common techniques employed in cellular immunologyandhistocompatibilitytesting.
16. Demonstrate application of knowledge of structure & development of tissue-organsystemtocomprehenddeviationsfromnormal.
17. Demonstrate knowledge about recent advances in medical sciences which facilitatecomprehension of structure function correlations and applications in clinical problemsolving.
18. Explaincollection,maintenanceandapplicationofstemcells,cryobankingandprinciplesof organdonationfromrecentlydeadbodies.
19. Demonstrateknowledgeaboutsurfacemarkingofallregionsofthebody.
20. Abletointerpretvariousradiographsofthebody,normalCTscan,ultrasoundandMRI.
21. Demonstrateknowledgeaboutdifferentanthropologicaltraitsanduseofrelatedinstruments .
22. Demonstrateknowledgeaboutoutlineofcomparativeanatomyofwholebodyandbasichum anevolution.
23. Demonstrateknowledgeaboutidentificationofhumanbones,determinationofsex,age,and

heightformedicolegalapplicationof anatomy.

B. Predominantin Affective domain

1. Demonstrateself-awarenessandpersonaldevelopmentinroutineconduct(Self-awareness).
2. Communicateeffectivelywithpeers,studentsandteachersinvariousteaching-learningactivities (Communication).
3. Demonstrate-
    a. Duerespectinhandlinghumanbodyparts&cadaversduringdissection(Ethics&Professionalism)
    b. Humanetouchwhiledemonstratinglivingsurfacemarkinginsubject/patient(Ethics &Professionalism).
4. Acquirethecapacity ofnotlettinghis/herpersonalbeliefs,prejudicesandlimitationscomeinthewayofduty.
5. Appreciatetheissuesofequityandsocialaccountabilitywhileexposingstudentstoearlyclinicalexposure(Equityandsocialaccountability).
6. Abilitytocommunicatewiththeregisteredbodydonors andfamilyofdonors.

C. PredominantinPsychomotordomain

1. Identify,dissect,locateanddemonstratesurfacemarkingofclinicallyimportantstructuresin the cadaverandcorrelateitwithlivinganatomy.
2. Acquiremasteryindissectionskills,embalming,tissuepreparation,stainingandmuseumpreparation.
3. Locateandidentifyclinicallyrelevantstructuresindissectedcadavers.
4. Locateandidentifycellsandtissuesunder themicroscope.
5. Identifytheanatomicalstructuresvisualizedbyimagingtechniques,specificallyradiographs,computerizedtomography(CT)scans,MRIandultrasonographyinnormalindividuals.
6. Demonstrate various movements at the important joints and actions of various groupsofmusclesinthehumanbody.

7. Demonstrateanatomicalbasisofcommonclinicalproceduresexpectedtobeperformedbyabasicmedicaldoctor.
8. Demonstratedifferentmethodsofteaching-learningandmakepresentationsofthesubjecttopicsandresearchoutputs.

Specificpracticebasedcompetencies:

Name/Descriptionofpracticebasedcompetencies
1. Grossanatomy: 1.1 Procurement,EmbalmingandPreservationofhumancadavers 1.2 Preparationoftanks forpreservingbodies 1.3 Dissectionofcadaver 1.4 Windowdissectionofimportantregions 1.5 Preparationofspecimens for museumwithdisplay a) softparts b) HardParts c) models d) charts 1.6 Preparation and preservation of human bones / skeleton as assignedbythefaculty 1.7 Grossanatomyfileinwhichlabelleddiagramsofimportantstructuresof upper limb, lower limb, thorax, abdomen, head & neck and brainshouldbedrawn.
2. Histology **2.1** Preparationofcommonfixativesforembalmingfluid,10%formalin,Bouin'sfluidetc**.** **2.2** Makingparaffinblocksandsectioncuttingand mounting**.** **2.3** Preparation of staining set for H and E staining and staining paraffinsectionswiththestain**.** 2.4 Makingcelloidin, araldite, gelatinblocksandtheirsectioncutting. 2.5 Processinghardtissues,decalcificationofbones,blockmakingandsectioning,preparationofground sectionsofcalcifiedbones.

	2.6 Frozensectioncuttingon freezingmicrotomeand cryostat**.** 2.7 Honingandstroppingofmicrotomeknives,includingsharpeningbyautomatic knifesharpener. **2.8** Histology file in which LM pictures of all the organs and tissues ofthe body should be drawn and a small description of salient featureswritten**.**
3.	**HistochemicalMethods** Practical classes for staining of glycogen, mucopolysaccharides, alkalinephosphatase,acidphosphatase andcalcium
4.	**Cytogenetics** 4.1 Preparationofmedia,differentsolutions,stainsetc. 4.2 Preparationofbuccalsmearforsexchromatin 4.3 Human chromosome preparation from peripheral blood andkaryotyping. 4.4 Bandingtechniques(GandC) 4.5 MakingofPedigree chartsforstudyofpatternsofinheritance. 4.6 Chromosomalanalysis.
5.	**Neuroanatomy** 5.1 Dissectionofbrainandspinalcordforteachingandlearningpurpose 5.2 Preparationofbrainandspinalcordmacroscopicandmicroscopicsections andidentificationofdifferentpartsinthem. 5.3 Discussionsonclinicalproblemsrelatedtoneurologicaldisordersandanatomicalexplanationforthe same.

SYLLABUS

Apostgraduatestudent,afterthreeyearsoftraininginM.D.(HumanAnatomy)shouldhaveacquiredknowledgeinthefollowingaspectsofanatomy:

A:Cognitivedomain:

Section–

1Grossanatom

Gross Anatomy of the entire body including general anatomy, upper limb, lower limb, thorax,abdomen,pelvis,perineum,headandneck,brainandspinalcordandosteology,crosssectional anatomyandembalmingprocedures.

Section-2

Developmentalanatomy/embryology

- Generalembryology:gametogenesis,fertilization,implantationandplacenta,earlyhumane mbryonicdevelopment.
- Systemicembryology:developmentoforgansystemsandassociatedcommoncongenitalab normalities withteratogenesis.
- Anatomicalbasis ofcongenitalanomalies.

Section-3

Histology and histo chemistry

Cell Biology

- Cytoplasm –cytoplasmic matrix,cell membrane,cell organelles,cytoskeleton,cellinclusions,ciliaandflagella.
- Nucleus-nuclearenvelope,nuclearmatrix,DNAandothercomponentsofchromatin,proteinsynthesis,nucleolus,nuclearchangesindicatingcelldeath.
- Cellcycle-mitosis,meiosis,cellrenewal.
- Cellulardifferentiationandproliferation.

Microscopicstructure ofthebody

- Principlesoflight,transmissionandscanning,electron,fluorescent,confocalandvirtualmic roscopy.
- Thesystems/organsofthebody-Cellularorganization,lightandelectronmicroscopicfeatures,structure-functioncorrelations,andcellularorganization.
- Varioushisto-techniquesandmuseumpreparationtechniques.

Section - 4Neuroanatom y

- Brainanditsenvironment,Developmentofthenervoussystem,NeuronandNeuroglia,Somat icsensorysystem,Olfactoryandopticpathways,Cochleo-vestibularandgustatory pathways,Motor pathways,Central autonomic pathways,Hypothalamo-hypophysealsystem,Limbicsystem,Basalganglia,Reticularsystem,Ventricular

system of brain, study of cross sectional anatomy of the brain and spinal cord and itsappliedanatomy.

Section - 5Genetics

- HumanChromosomes-Structure,numberandclassification,methodsofchromosomepreparation and banding patterns. Chromosome abnormalities, Autosomal and Sexchromosomalabnormalitiessyndromes,Molecularand Cytogenetics.
- Singlegenepatterninheritance:AutosomalandSexchromosomalpatternofinheritance,Intermediatepatternandmultiplealleles,Mutations,Non-Mendelianinheritance,Mitochondrialinheritance,Genomeimprinting,parentaldisomy.
- Multifactorialpatternofinheritance:Criteriaformultifactorialinheritance,Teratology,Structuregene,MolecularScreening,CancerGenetics-Haematologicalmalignancies,Pharmacogenetics.
- ReproductionGenetics-MaleandFemaleInfertility,Abortuses,Assistedreproduction,Preimplantationgenetics,Prenataldiagnosis,GeneticCounselingandEthicsofGenetics.
- PrinciplesofGenetherapyanditsapplied knowledge.

Section- 6Immunology

- Immune system and the cell types involved in defense mechanisms of the body. Grossfeatures, cytoarchitecture, functions, development and histogenesis of various primaryandsecondarylymphoidorgansinthebody.
- Biological and clinical significance of the major histocompatibility complex of manincludingitsroleintransplantation,diseasesusceptibility/resistanceandgeneticcontrol oftheimmuneresponse.
- Varioustechniquesemployedincellularimmunologyandhistocompatibilitytesting.
- Principles of Molecular hybridization and PCR technology in immunology researchparticularly mechanism of antigen presentation, structural and functional relevance oftheTcellreceptor,geneticcontrol of theimmuneresponse,molecularbasisofsusceptibilitytodisease.

Section-7

Appliedanatomyandrecent advances

- Clinicalcorrelationsofstructureandfunctionsofthehumanbody.Anatomicalbasisandexplanationsforclinicalproblems.
- Applicationsofknowledgeofdevelopment,structural(microscopy),neuro-anatomytocomprehenddeviationsfromnormal.
- Recentadvancesinmedicalscienceswhichfacilitatecomprehensionofstructurefunctioncorrelationsandapplicationsinclinicalproblemsolving.
- Collection,maintenanceandapplicationofstemcells,cryobankingandprinciplesoforgandonationfromrecentlyprocured.

Section–8

SurfaceMarkingandRadiology

- Surface marking of all regions of the body. Interpretation of normal radiographs of thebodyincludingspecialcontrastproceduresincludingbariumstudies,cholecystography, pyelography,andsalpingography.NormalCTScan,MRI andultrasonography.

Section–9

AnthropologyandComparativeAnatomy

- Different anthropologicaltraits,IdentificationanduseofAnthropologicalinstruments.
- Outlineofcomparativeanatomyofthewhole bodyand basichumanevolution.

Section–10ForensicMedicine

- Identification of human bones from their remains and determination of sex, age, andheight.formedicolegalapplicationofAnatomy.

B -PSYCHOMOTORDOMAIN:

DemonstratefollowingpredominantPsychomotordomaincompetencies		
Sr. No	**Competency**	**Perform undersupervision /performIndependently/ Observationonly**
1.	Identify, locate and demonstrate surface marking of clinicallyimportantstructuresinthecadaverandcorrelateitwithliving anatomy	Independently
2.	Acquiremasteryindissectionskills includingwindow dissectionofimportantregions	Independently
3.	Acquiremasteryinembalming thehumanbody	Independently
4.	Preparetanks forpreservingbodies	Observation
5.	Tissuepreparationforhistologyandstainingtechniques	Independently
6.	HoningandStroppingofmicrotomeknives,including sharpening byautomaticknife sharpener	Independently
7.	Preparationofcommonfixativesembalmingfluid10% formalin, Bouin's fluidetc.	Independently
8.	Demonstratethemounting ofspecimen inthemuseum	Independently
9.	Locateandidentifyclinicallyrelevantstructuresindissected cadavers.	Independently
10.	Locate,identifyand demonstratecells&tissuesunderthe microscope.	Independently
11.	Identifytheanatomicalstructuresvisualizedbyimaging techniques,specificallyradiographs,computerizedtomography(CT) scans,MRI and ultrasonographyin normalindividuals	Independently
12.	Demonstratevariousmovementsattheimportantjointsand actionsofvariousgroupsofmusclesinthe human body.	Independently
13.	Demonstrateanatomical basisofcommonclinicalprocedures expectedtobeperformedbyabasicmedicaldoctor.	Under supervision
14.	Demonstratedifferentmethodsofteaching-learningand assessments.Independently	Independently
15.	Makepresentationsofthesubjecttopicsforteachingand researchoutputs.independently	Independently
16.	Preparebuccalsmearforsexchromatin.independently	Independently
17.	PrepareHumanchromosomefromperipheralbloodand karyotyping.Undersupervision	Under supervision
18.	DemonstrateBandingtechniques(GandC)andChromosomal AnalysisUndersupervision	Under supervision
19.	Demonstrateuseofdifferentanthropologicalinstruments	Under supervision

DepartmentalResources:

It is mandatory for the Department of Anatomy to develop at least three of the followinglaboratories, in addition to the other facilities. The laboratory should be involved in activeresearchinatleastonewelldefinedfield.

1. Histology
2. Immunology
3. Electronmicroscopy/Fluorescencemicroscopy/confocalandotherformsofmicroscopylaboratories
4. Developmentalanatomy
5. Anthropometry
6. Neuroanatomy
7. Cytogenetics
8. ImagingtechniqueforRadiologicalAnatomy

TEACHINGANDLEARNINGMETHODS:

Generalprinciples

Acquisition of competencies being the keystone of doctoral medical education, such trainingshould be skills oriented. Learning in the program, essentially autonomous and self-directed,and emanating from academic and clinical work, shall also include assisted learning. Theformalsessionsaremeanttosupplementthis coreeffort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residentsduring the period of training, attending not less than 80% of the training activity during thecalendar year, and participating in all assignments and facets of the educational process. Theyshall maintain a log book for recording the training they have undergone, and details of theproceduresdone duringlaboratoryandclinicalpostingsinrealtime.

Teaching-Learningmethods

Thisshould includeajudiciousmixofdemonstrationsofdissections, symposia,journalclubs,seminars,smallgroupdiscussion,case-basedlearning,simulation-basedteaching,self-directedlearning, integrated learning, interdepartmental meetings and any other collaborative activitywiththeallieddepartments.Methodswithexposuretotheappliedaspectsofthesubjectshould also be used. **The suggested examples of teaching-learning methods are given below butare notlimitedtothese.**

A. Lectures:Didacticlecturesshouldbeusedsparingly.Aminimumof10lecturesperyearissuggested.Allpostgraduatetraineeswillberequiredtoattendtheselectures.Someexamplesoftopics whichcanbecoveredinlectureare:

1. Topicsingross,surfaceandcrosssectionalanatomy,microanatomy,embryology,neuroanatomy,histochemistry,andgenetics.
2. Recentadvancesinmicroanatomy,embryology,neuroanatomy,histochemistry,andgenetics.
3. Researchmethodologyandbiostatistics.
4. **Salientfeaturesof**Undergraduate/Postgraduatemedicalcurriculum.
5. Teachingandassessmentmethodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medicaleducationworkshopsintheinstitute.

B. Journalclub:Minimumofoncein1-2weeksissuggested.

Topics will include presentation and critical appraisal of original research papers published inpeer reviewed indexed journals. The presenter(s) shall be assessed by faculty and gradesrecordedinthelogbook.

C. StudentSeminar: Minimumofonceevery1-2 weeksissuggested.

Important topics should be selected and allotted for in-depth study by a postgraduate student.Ateachershouldbeallocatedforeachseminarasfacultymoderatortohelpthestudentprepare thetopicwell.Itshouldaimatcomprehensiveevidence-basedreviewofthetopic.Thestudentshouldbegradedbythefacultyandpeers.

D. StudentSymposium:Minimumofonceevery3months.

Abroadtopicofsignificanceshouldbeselected,andeachpartshallbedealtby onepostgraduate student. A teachermoderator should be allocatedforeach symposium andmoderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by thefacultyandpeers.

E. Laboratory work: Minimum-onceevery1-2weeks.

Laboratory work/ Skills lab teaching should be coordinated and guided by faculty from thedepartment.VariousmethodslikeDOAP(Demonstrate,Observe,Assist,Perform),simulations in skill lab, and case-based discussions etc. are to be used. Faculty from thedepartmentshouldparticipateinmoderatingtheteaching-learningsessions.Hands-onexperience on various techniques and procedures in microanatomy, histochemistry, genetics,embalming&preparationof museumspecimensshouldbeacquired.

F. Inter departmental colloquium

Faculty and students must attend monthly meetings between the main Department and other department/sontopics of current/commoninterest.

G. a. Rotationalclinical/community/institutionalpostings

Depending on local institutional policy and the subject specialty needs, postgraduate traineesmay be posted in relevant departments/ units/ institutions. The aim would be to acquire morein-depth knowledgeas applicableto theconcernedspecialty.Postings wouldberotatedbetweenvariousunits/departmentsanddetailstobeincludedinthespecialty-basedGuidelines.**The postings schedule withdurationis givenbelow:**

- Surgery -2weeks
- Radiology -2weeks
- Pathology -2weeks
- ENT -1week
- Ophthalmology -1week
- Obstetrics&Gynecology -1 week
- Pediatrics -1week
- MedicalEducationUnit -1week(Optional& can bedonein common with other departmentPGs

Everypostingshouldhaveitsdefinedlearningobjectives.Itisrecommendedthatthedepartments draw up objectives and guidelines for every posting offered in conjunction withthe collaborating department/s orunit/s.This will ensure thatstudents acquire expectedcompetenciesandarenotconsideredasanadditional helping handforthedepartment/unitinwhich they are posted. The PG student must be tagged along with those of other relevantdepartmentsforbedsidecasediscussion/basicscienceexercisesasneeded,undertheguidanceofanassignedfaculty.

To consider and approve the tmpte Students admitted in the 2021-22 batch as per the NMC notifications vide letter F.No. NMC23(1)(25)12021/PG/053909 dated 2211212022 and Clarification issued by NMC vide tetter F. N o. N M C/23 (1) (25) 12021 I Med. I 00 1 866 d ated 1 9 I Ot t 2023 Resolution ' with reference to the NMC notifications vide letter F.No. NMC-23(1)(25)t2o21tpcto53g0g dated 2211212022 and Clarification issued by NMC vide letter F.No.NMC/23(1)(25)t2021/Med./001g66 dated 1910112023. the District Residency Program (DRP) shall be implemented for the students admitted in 2021-22 batch onwards. The said notification and clarification from NMC were considered and passed unanimously.

The communication from National Medical Commission vide no. NMC-23 (1) (25) / 2021 / PG / 053909, dated 22.12.2022 regarding Implementation of District Residency Programme, and National Medical Commission vide no. NMC-23(1)(25)/2021/Med./001866, dated

19.01.2023 regarding Clarification on implementation of District Residency Programme, is adopted for execution.

(BOS-Ref :SBKSMIRC/Dean/Outward No.1158/2022-23, Date of Academic council : 11/02/2023)

(BOM-Ref. No.: SVDU/R/2431-A/2022-23, Date of Academic council : 29/05/2023)

- With reference to the Notification vide no. MC!-18(1)12020-Med.1121415, dated 16.09.2020, related to 'Postgraduate Medical Education (Amendment) Regulations 2020'; all the postgraduate students pursuing MD / MS in broad specialties in Sumandeep Vidyapeeth Deemed to be University, as a part of course curriculum, shall undergo a compulsory Residential rotational posting in the 3rd or 4th or Sth semester of the Postgraduate programme, for a duration of three months, in the District Hospitals / District Health System, is confirmed and approved for execution.

- (Board of Studies letter no.:SBKS/DEAN/1576/2020,dated 0/10/2021 and Vide Notification of Board of Management Resolution : Ref no. SVDU/R/1271-1/2020-21, dated - 30th December 2020)

  - To introduce Basic life support (BLS) and Advanced Cardiac Life Support (ACLS) trainingforalltheFirstyearPostgraduateResidentDoctorsfromacademicyear2017-18

  - To introduce New chapter / topic 'Intellectual Property Rights (IPR) foralltheFirstyearPostgraduateResidentDoctorsfromacademicyear2020-2021 of duration of 4hrs (Board of Studies letter no.: SBKS/DEAN/742/2021,dated 05/06/2021 and Vide Notification of Board of Management Resolution Ref no.:SVDU/R/3051-1/2020-21, dated - 29" July 2021)

    List of topics :

1. Introduction-ConceptofIntellectualProperty,Historicalviewof Intellectual Property system in India and International Scenario, Evolution of Intellectual Property Laws in India, Legal basis of Intellectual Property Protection, Need for Protecting Intellectual Property, Theories on concept of property - Major IP Laws in India.
2. Types of IPR: Patents, Copyright, Trademark Industrial Designs, TradeSecrets.
3. Patents: Concept of Patent, Criteria of Patentability, Inventions NOT patentable, Process of Obtaining a Patent, Duration of Patents, Rights of Patentee, Limitation of rights, Infringement andEnforcement.
4. Copyrights: Meaning of Copyright, Copyright Vs. Moral rights, Copyrighteligibility,TermofCopyright,RegistrationofCopyright, Infringement andRemedies
5. Trademark: Meaning of Trademark, Criteria for trademark, Procedure for Trademark Registration, Term of protection, Infringement andRemedies.
6. Industrial Designs: Meaning of Industrial Designs, Rights in Industrial Designs: Nature, Acquisition and duration ofrights.
7. Trade Secrets: Meaning of Trade Secrets, Need to protectTrade secrets, Criteria of Protection, Procedure for registration, Infringement.
8. Commercialization of IPR: Traditional IP and Evolving IP, Assignment, Licensing, Cross License, Patent Pool, Negotiations, Defensive Publications, TechnicalDisclosures, Patent Pooling, Patent Trolling, Brand Management, Brand and Pricing Strategies.

H. Teachingresearchskills

Writingathesisshouldbeusedforinculcatingresearchknowledgeandskills.Allpostgraduatestudents shall conduct a research project of sufficient depth to be presented to the Universityas a postgraduate thesis (if so mandated) under the supervision of an eligible faculty memberof the department as guide and one or more co-guides who may be from the same or otherdepartments.

In addition to the thesis project, every postgraduate trainee shall participate in at least oneadditional research project that may be started or already ongoing in the department. It ispreferable that this project will be in an area different from the thesis work. For instance, if aclinical research project is taken up as thesis work, the additional project may deal withcommunity/field/laboratorywork.Diversityofknowledgeandskillscantherebybereinforced.

I. Traininginteachingskills

MEU/DOMEshouldtrainPGstudentsineducationmethodologiesandassessmenttechniques.The PG students shall conduct UG classes in various courses and a faculty shall observe andprovidefeedbackontheteachingskills ofthestudent.

J. Logbook

Duringthetrainingperiod,thepostgraduatestudentshouldmaintainaLogBookindicatingtheduration ofthepostings/work doneinlabs,dissectionhall,skilllabsandotherareasofposting.Thisshouldindicatetheproceduresassistedandperformedandtheteachingsessionsattended.The log book entries must be done in real time. The log book is thus a record of variousactivities by the student like: (1) Overall participation & performance, (2) attendance, (3)participationinsessions,(4)recordofcompletionofpre-determinedactivities,and(5)acquisitionofselectedcompetencies.

The purposeofthe LogBookisto:

a) helpmaintainarecordoftheworkdoneduring training,
b) enable Faculty/Consultantstohavedirectinformationabouttheworkdoneandintervene,ifnecessary,
c) providefeedbackandassesstheprogressoflearningwithexperiencegainedperiodically.

TheLogBookshouldbeusedintheinternalassessmentofthestudent,shouldbecheckedandassessed

periodically by the faculty members imparting the training. The PG students will berequiredtoproducecompletedlogbookinoriginalatthetimeoffinalpracticalexamination.

It should be signed by the Head of the Department. A proficiency certificate from the Head ofDepartment regarding the clinical competence and skillful performance of procedures by thestudentwillbe submittedbythe PG studentatthe timeofthe examination.

The PG students shall be trained to reflect and record their reflections in log book particularlyof the critical incidents.Components of good teaching practices must be assessed in allacademicactivity conductedby thePGstudentandatleasttwosessionsdedicatedforassessment of teaching skills must be conducted every year of the PG program. The teachingfacultyare referredtothe MCILogbookGuidelinesuploadedonthe Website.

K. Course in Research Methodology: All postgraduate students shall complete an onlinecourse in Research Methodology within six months of the commencement of the batch andgenerate theonlinecertificateonsuccessfulcompletionofthecourse.

Otheraspects:

- ThePostgraduatetraineesmustparticipateintheteachingandtrainingprogramofundergraduate students andinterns attendingthedepartment.
- Traineesshallattendaccreditedscientificmeetings(CME,symposia,andconferences)atleast onceayear.
- Departmentshallencouragee-learningactivities.
- ThePostgraduatetraineesshouldundergotraininginBasicCardiacLifeSupport(BCLS)andAdvancedCardiac LifeSupport(ACLS).
- ThePostgraduatetraineesmustundergotraininginformationtechnologyanduseofcomputers.

During the training program, patient safety is of paramount importance; therefore,relevantclinicalskillsaretobelearntinitiallyonthemodels,latertobeperformedundersupervision followed by independent performance. For this purpose, provision of skillslaboratoriesinmedicalcollegesis mandatory.

ASSESSMENT

FORMATIVEASSESSMENT,ie.,assessmenttoimprove learning

Formative assessment should be continual and should assess medical knowledge, patientcare, procedural & academic skills, interpersonal skills, professionalism, self-directedlearningandabilitytopractice inthesystem.

Duringthethree-yeartrainingperiod,

- A record of all theoretical, practical and experimental work done by the post graduatestudent and its assessment will be kept and shall be available for examiners at the timeofthefinalpracticalandvivavoce examination.
- Therewillbeperiodicalexaminationsduringthecourseoftraining.Thepre-finaltheoryandpracticalexaminationwillbeconductedbythefacultyofthe concernedcollege.

GeneralPrinciples

Internal Assessment should be frequent, cover all domains of learning and used to providefeedbacktoimprove
learning;itshouldalsocoverprofessionalismandcommunicationskills.

The Internal Assessment should be conducted in theory and practical/clinical examination,should be frequent, cover all domains of learning and used to provide feedback to improvelearning; itshouldalsocoverprofessionalismandcommunicationskills.

QuarterlyassessmentduringtheMDtrainingshouldbebasedon:

- Dissectionpresentation :once a week
- Laboratoryperformance :twice aweek
- Journalclub :once a week
- Seminar :onceafortnight
- Casediscussions :onceafortnight/month
- Interdepartmentalcaseorseminar :onceamonth

Note: Thesesessionsmaybeorganizedandrecordedasaninstitutionalactivityforallpostgraduates.

- AttendanceatScientificmeetings,CMEprogrammes(atleast02each)

Thestudenttobeassessedperiodicallyaspercategorieslistedinthepreclinicalpostgraduatestudentappraisalform(AnnexureI).

SUMMATIVEASSESSMENT, ie.,assessmentat

theendoftrainingEssentialpre-requisitesforappearingforexaminationinclude:

1. **Logbook**ofworkdoneduringthetrainingperiodincludingrotationpostings,departmentalpresen

tations,andinternalassessmentreportsshouldbe submitted.

2. At least **two presentations** at national level conference. One research paper should bepublished / accepted in an indexed journal**. (It is suggested that the local or UniversityReview committeeassess the worksentforpublication).**

Thesummativeexamination wouldbecarriedoutasper theRulesgiveninthelatestPOSTGRADUATE MEDICAL EDUCATION REGULATIONS. The theory examinationshallbeheldinadvancebeforetheClinicalandPracticalexamination,sothattheanswerbookscan be assessed and evaluated before the commencement of the clinical/Practical and Oralexamination**.**

Thepostgraduateexaminationshallbeinthreeparts**:**

1. **Thesis**

   Thesis shall be submitted at least six months before the Theory and Clinical / Practicalexamination. The thesis shall be examined by a minimum of three examiners; one internaland two external examiners, who shall not be the examiners for Theory and Clinicalexamination. A post graduate student in broad specialty shall be allowed to appear for theTheory and Practical/Clinical examination only after the acceptance of the Thesis by theexaminers**.**

2. **Theoryexamination**

   The examinations shall be organized on the basis of 'Grading'or 'Marking system' toevaluate and to certify post graduate student's level of knowledge, skill and competence attheendofthetraining,asgiveninthelatestPOSTGRADUATEMEDICALEDUCATIONREGULATIONS. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical'separately shall be mandatory for passing examination as a whole. The examination forM.D./M.Sshallbeheldattheendof3rd academicyear.

   Thereshall befourtheorypapers(asperPGRegulations).

   PaperI:GrossAnatomy,Embryology,MicroscopicAnatomyofhumanbodyabovethediaphragm withRadiologicalAnatomy&BodyPreservation

   a) GrossAnatomy ofhumanbodyabovethediaphragmi.e.upperlimb,thorax,headandneck.

   b) Embryology&Microscopicanatomy oftissuesandorgans abovethediaphragm.

   c)Methods of preservation of human body and its parts, radiological anatomy, sectionalanatomy

PaperII:Gross Anatomy,Embryology,MicroscopicAnatomyofhumanbodybelowthe diaphragmwithGeneral(Embryology&Microscopic)Anatomy

a) GrossAnatomyofhumanbodybelowthediaphragmi.e.lowerlimb,abdomen,pelvis.
b) Embryology& Microscopicanatomyoftissuesandorgansbelowthediaphragm.
c) GeneralHistology,GeneralEmbryology
d) Principlesoflight,transmissionandscanningelectronmicroscopy,confocal,virtualmicroscopy.

PaperIII: Neuroanatomy& Genetics

a) Neuroanatomy-grossandappliedaspects.
b) Generalprinciplesofgenetics,cytogeneticsasapplicabletomedicineanddifferentgenetic disorders,genetherapy.

PaperIV:Recent advancesandapplied Anatomy in medicalsciences

a) Comparativeand evolutionaryanatomy
b) Clinicalandappliedaspect ofAnatomy
c) Recentadvances intheapplication ofknowledgeofanatomy on humanbody
d) Basics ofprinciplesoforgandonation fromrecently dead bodies.

3. Practical/clinicalandOral/vivavoceexaminationPr acticalexamination

Practicalexaminationshouldbespreadover**two**daysandincludevariousmajorcomponentsofthe syllabusfocusingmainlyonthepsychomotordomain.

- **FirstDayPractical:**Tosubmitthedulysignedgrossanatomyfile,histologyfile&thelogbookandthesis
  - **a) GrossAnatomy**
    Dissectionandrelatedvivavoce,Majorandminordissectionstobeincluded.
  - **b) Histology**
    Spotting(10spots)andvivavoce
    Techniquesoftissueprocessing,
    paraffinblockmaking,sectioncuttingandstaining(HandEstain)
    withrelatedviva
- **SecondDayPractical:**
  - **a)** Microteachingofa shorttopictoassessteachingskills
  - **b)** Ashortsynopsisofthethesisworkshouldbepresentedbythepostgraduatestudent
  - **c)** GrandvivaincludingGrossanatomy,crosssectionalanatomy,radiological Anatomy,SurfaceAnatomy,Embryology**.**

Oral/Viva voce examination on defined areas should be conducted by each examinerseparately. Oral examination shall be comprehensive enough to test the post graduatestudent'soverallknowledgeofthesubjectfocusingonpsychomotorandaffectivedomain.

PracticalExaminationtobeorganizedasperdetailsgiven below:

- Dissectiononcadaver
- Histologyspotting
- Histologicaltechniques
- SurfaceMarking
- Radiology
- Teachingability
- Thesispresentation

Oral / Viva-voce ExaminationGrandviva

On dissected parts of the whole human body including nervous system, and Embryologymodels, teratology, skeletal system including short bones, embalming techniques andgenetics,radiographs,MRI,CT&ultrasonography.

Recommendedreading:

Books(latestedition)

GrossAnatomy:

- SusanStrandring:Gray'sAnatomy:Theanatomicalbasisofclinicalpractice,ChurchillLivingstone Elsevier.
- KeithandMooreClinicallyOrientedAnatomy.LippincotWilliamsandWilkins.
- R.J.Last.AnatomyRegionalandApplied.ChurchillLivingston.
- FrankH. Netter.AtlasofHumanAnatomy.SaundersElsevier.
- MLAjmani.Embalming:PrinciplesandLegalAspects.JaypeeBrothers.

Histology

- YoungB. andHeathJ.Wheater'sFunctionalHistology.ChurchillLivingstone.
- M.H.ERoss. Histology:Atextbookandatlas. WilliamsandWilkins.
- HaroldADavenport.HistologicalandHistochemicalTechniques.W.BSaundersCompany.

Genetics

- J.SThompsonandThompson.Geneticsinmedicine.W.B.SaundersandCo.Philadelphia,London.

Embryology

- TWSadler.Langman's MedicalEmbryology.Lippincotts, Williams andWilkins
- KeithLMooreandT.V.N.Persaud. TheDevelopingHuman. Saunders.

Neuroanatomy

- RichardS.Snell.ClinicalNeuroanatomyforMedicalStudents.Williamsand Wilkins.

Statistics

- DavidE.MatthewsandVernonT.Farewell.UsingandUnderstandingMedicalStatistics.Karger.

Radiology

- J.B. Walter et.al. Basic Atlas of Sectional Anatomy with correlated imaging. SaundersElsevier.

Surfaceanatomy

- SPJohn,Lumleyeditors.SurfaceAnatomy,TheAnatomicalbasisofclinicalexamination.London:ChurchillLivingstone.

Journals

03-05internationalJournalsand02national(allindexed)journals

AnnexureI

StudentappraisalformforMDinHumanAnatomy										
	Elements	**LessthanSatisfactory**			**Satisfactory**			**More thansatisfactory**			**Comments**
		1	2	3	4	5	6	7	8	9	
1	**Scholasticaptitude andlearning**										
1.1	Has knowledgeappropriateforleveloftraining										
1.2	Participation andcontributiontolearning activity(e.g.,JournalClub, Seminars, CMEetc)										
1.3	Conductofresearchandotherscholarlyactivity assigned(e.gPosters, publicationsetc)										
1.4	Documentation ofacquisitionofcompetence (egLogbook)										
1.5	Performance inworkbased assessments										
1.6	Self-directed Learning										
2	**Work related totraining**										
2.1	Practical skills thatareappropriatefor theleveloftraining										
2.2	Respectforprocesses andproceduresinthe workspace										
2.3	Abilitytoworkwithothermembers oftheteam										

2.4	Participationandcompliance with thequalityimprovementprocessattheworkenvironment										

2.5	Abilitytorecordand document workaccurately andappropriateforlevel oftraining										
3	**Professional attributes**										
3.1	Responsibility andaccountability										
3.2	Contributiontogrowth of learningoftheteam										
3.3	Conduct that isethicallyappropriate andrespectful at alltimes										
4	**Space foradditionalcomments**										
5	**Disposition**										
	Has this assessmentpatternbeendiscussed withthe trainee?	Yes	No								
	Ifnotexplain.										
	NameandSignature oftheassesse										
	NameandSignature oftheassessor										
	Date										

Subject Expert Group members for preparation of REVISED Guidelines forcompetency based postgraduate training programme for MD in HumanAnatomy

1. **Dr. PraveenRSingh** — Convener
   Professor &
   Head,DepartmentofAna
   tomy
   AssistantDean,BasicSciencesEducationPr
   amukhswami Medical
   College,Karamsad,Gujarat

2. **DrAnjaliJain** — Member
   Professor of
   AnatomyChristianMedical
   College,Ludhiana,Punjab

3. **Dr.PriyaRanganath** — Member
   Professor &
   Head,DepartmentofAna
   tomy
   Bangalore Medical College & Research
   InstituteBangalore,Karnataka

4. **Dr.MPadmavathi** — Member
   Professor of
   AnatomyOsmaniaMedica
   lCollegeAndhra Pradesh

5. **Dr.RubiSaikia** — Member
   Professor &
   HeadDepartmentofAnat
   omy
   JorhatMedicalCollege
   &Hospital,Jorhat,Assam