Guidelines

for

Competency Based Training Programme

in

DNB- Peripheral Vascular Surgery

NATIONAL BOARD OF EXAMINATIONS

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PREAMBLE

Vascular Surgery is a relatively new specialty in India. It is a demanding, highly specialized and progressively expanding discipline, which is concerned with diagnosis, treatment and prevention of diseases of arteries, veins in the entire body (neck, trunk and limbs) except within the skull and around the heart and to some extent lymphatics. India is witnessing an exponential growth in the patients suffering from vascular disorders, mainly because of rapid increase in diabetes. Due to dearth of vascular specialists, there is continued, but unnecessary loss of limb and life. Hence there is a need to have more vascular surgeons across the country and this has driven NBE to start the training courses in this super specialty in accredited hospitals in India, especially since no other training (like CTS, general surgery) offers even the basic knowledge and training in vascular diseases and their therapies. The aim of Vascular Surgery is preservation of functional tissue, be it a limb, the brain, the gut, the kidneys or other organs. The candidate at completion of training should be a “vascular specialist” rather than only “vascular surgeon”. He/she should be able to provide comprehensive care to all vascular disorders, which includes medical, “open” surgical and minimally invasive endovascular procedures. He/she should be able to provide skilled care to patients with diabetic foot problems, have expertise in vascular medicine, and preventive measures including life style modifications.

INTRODUCTION

The purpose of this curriculum is to train vascular surgeons who, at the end of the program, will be able to work independently and to the standard of a consultant or equivalent. Though most of their training and skills will relate to the management of 'everyday' vascular diseases, elective and emergency, they will be able to evaluate and treat some complex vascular pathologies This forms the basis of the curriculum, with competence in both non-operative and vascular interventional therapies, be it surgery, endovascular and combined “hybrid” procedures, being completed by the final year of training. This curriculum also allows a degree of flexibility to respond to the changing needs of vascular patients and the development of new models of healthcare delivery, and to incorporate technological advances, particularly in endovascular procedures.

At the completion of surgical training they should be competent to manage elective and emergency vascular problems, able to address complex vascular pathologies and develop interest to pursue further advanced training in focused fields, which might be outside the realm of this curriculum. The curriculum will also aim to encourage clinical research, and publications in peer reviewed journals, apart from pursuing an “academic” career.

PROGRAM GOALS

a) To provide high quality training in Vascular Sciences in select institutions.

b) To attain proficiency in treating all extra cranial and non-cardiac vascular disorders.

c) To motivate them to conduct epidemiological & clinical research in several vascular problems which are unique to India.

d) To motivate them to be teachers to the forthcoming generations of Vascular Surgeons/specialists.

e) Above all, to maintain high ethical standards and follow one of the essential qualities of the clinician**. "….. for the secret of the care of the patient is in caring for the patient…" (Dr. Francis Peabody – Harvard Medical School 1927)**

At the end of the course the candidate should have acquired knowledge, skills, aptitude and attitude to be able to function as an independent clinician/ consultant and a teacher.

PROGRAM OBJECTIVES

The trainee should achieve such knowledge and receive hands-on experience during the training period that he/she after qualification will be:

- Proficient and knowledgeable in thorough clinical examination of the patient, determination and confirmation of clinical diagnosis, need for further diagnostic work up and/or therapy individualized to patient's requirements.
- Proficient and knowledgeable in physiological, non-invasive diagnostic methods of vascular assessment
- Proficient and knowledgeable in various imaging modalities of vascular system
- Proficient and knowledgeable in the "Best Medical Care" for all the vascular patients, whether they require intervention or not, using multifaceted approach
- Able to recognize and assess the risk factors, stratify them and provide comprehensive care, with other specialties when indicated
- Adept at providing appropriate preoperative care, selection and accomplishment of appropriate operative procedures, direction of postoperative care and accomplishment of sufficient follow-up management of vascular patients.
- Proficient and knowledgeable in the indications for and the technical skills to carry out the procedures requiring catheter-based endovascular technologies.
- Proficient and knowledgeable in the indications for and technical skills to carry out the procedures requiring traditional open vascular surgical techniques.
- Conversant with care of chronic venous diseases – conservative management, open and endovenous ablations, sclerotherapy for varicose veins
- Proficient in diagnosis and treatment of Venous Thromboembolism in different areas, not just lower limbs; need to have expertise in anticoagulation and thrombolytic therapies, venous interventions
- Able to assess and manage acute thrombotic/embolic/ other forms of occlusive arterial diseases including limbs, mesenteric and other visceral vessels, great vessels and supra aortic arteries;
- Thoroughly proficient in recognizing chronic limb arterial disease/ischemia, especially lower limbs at various stages – asymptomatic, symptomatic, critical limb threatening ischemia and well-structured, targeted therapy of each. **This should form the core of vascular training.** This proficiency should also extend to occlusive disease of all extra cranial and non-cardiac vessels

- Possess ability to diagnose and provide varied therapeutic options (non-interventional, surgical, endovascular, hybrid) to patients with asymptomatic, symptomatic arterial aneurysms of various etiologies and types, including aortic, peripheral and visceral vessels and aortic dissections
- Competent to diagnose and treat extra cranial cerebrovascular disease – carotid, vertebral, innominate pathologies and therapies including medical, surgical and endovascular
- Able to address all diabetic foot related problems (neuropathic, neuro ischemic, ischemic).
- Able to evaluate and treat acute and chronic foot wounds, foot and leg infections, perform required debridements and amputations
- Adroit in assessing and providing care to traumatized patient – assess multiply injured patient, which should be carried over from general surgical training and. provide specialized care for vascular (arterial/venous) injuries, which should also include iatrogenic injuries
- Skilled in vascular access procedures for hemodialysis
- Accomplished in treating all forms of non-atherosclerotic vascular diseases, including vasospastic disorders, vascular malformations/arterio -venous fistulae, congenital vascular diseases, TOS, lymphedema etc. This list is not exhaustive.

The above knowledge is continuously updated by various educational programs within the department and through national, international conferences and journals apart from prescribed textbooks

ELIGIBILITY CRITERIA FOR ADMISSIONS TO THE PROGRAM

DNB Peripheral Vascular Surgery Course:

1. Any medical graduate with DNB/MS in General Surgery qualification, who has passed the Entrance Examination conducted by NBE and fulfill the eligibility criteria for admission to DNB Super Specialty courses at various NBE accredited Medical Colleges/ institutions/Hospitals in India is eligible to participate in the Centralized counseling for allocation of DNB in Peripheral Vascular Surgery seats purely on merit cum choice basis.

2. Admission to 3 years DNB Peripheral Vascular Surgery course is only through Entrance Examination conducted by NBE and Centralized Merit Based Counseling conducted by National Board of Examination as per prescribed guidelines.

The Course:

1. Three (3) years from first quarter of every calendar year
2. Number seats variable depending on the number of accredited institutions and their infrastructure
3. Structured to provide progressively graded training to achieve the level of a “Consultant” vascular surgeon/specialist after successful completion of the exit exam given annually

TEACHING AND TRAINING ACTIVITIES

The fundamental components of the teaching program should include:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- Once a week
4. Faculty lecture teaching- once a month
5. Clinical Audit/Morbidity & Mortality meeting: Once a Month
6. Every candidate should have one "poster" and/or a oral presentation (accepted/presented) per year in one of the following recognized vascular conference:

a. Vascular Society of India Annual Conference

b. Vascular Society of India – Mid term Conference

- Acceptance/presentation of one poster/oral presentation per year in one of the following conferences:

a. Society of Vascular Surgery (USA) Annual Conference
b. European Society of Vascular Surgery
c. Asian Society of Vascular Surgery
d. Annual Charing Cross symposium
e. Annual LINC conference
f. Annual Veith conference

Note: This list is open to future amendments

7. One publication/acceptance per candidate per year in a peer reviewed journal including Indian Journal of Vascular and Endovascular Surgery

The rounds should include bedside sessions, file rounds & documentation of case history and examination, progress notes, round discussions, investigations and management plan) interesting and difficult case unit discussions.

The training program would focus on knowledge, skills and aptitude, all essential components of education. It is being divided into theoretical, clinical and practical in all aspects of the delivery of patient care, including methodology of research and teaching.

Theoretical: The theoretical knowledge would be imparted to the candidates through discussions, journal clubs, symposia and seminars, but mostly by encouraging them to study the prescribed text books The students are exposed to recent advances through discussions in journal clubs. These are considered necessary in view of an inadequate exposure to the subject in the undergraduate and surgical postgraduate curriculum.

Symposia: Trainees would be required to present a minimum of 20 topics based on the curriculum in a period of three years to the combined class of teachers and students. A free discussion would be encouraged in these symposia. The topics of the symposia would be given to the trainees with the dates for presentation.

Clinical: The trainee should be able to work with all teachers – attached to a member only for a thesis to be able to pick up methods of history taking, examination, prescription writing and management in rehabilitation practice.

Bedside: The trainee would work up patients;, learn management of cases by discussion with faculty of the department.

Journal Clubs: This would be a weekly academic exercise. A list of suggested Journals is given towards the end of this document. The candidate would summarize and discuss the scientific article critically. A faculty member will suggest the article and moderate the discussion, with participation by other faculty members and resident doctors. The contributions made by the article in furtherance of the scientific knowledge and limitations, if any, will be highlighted.

Research: The student would carry out the clinical research project and write a thesis/ dissertation in accordance with NBE guidelines. He/ she would also be encouraged to take part in ongoing and planned clinical research projects in the departments to learn their planning, methodology, execution and other aspects of research.

I. GENERAL SYLLABUS

General Surgery curriculum

II. CORE VASCULAR SYLLABUS

The candidates selected to this course would have already completed 3 years General Surgical (GS) training in accredited institutions in India and have completed their certification (DNB/MS) successfully. It is assumed they have attained accepted levels of relevant knowledge and skills in general surgery. Since exposure to diagnosis and treatment of vascular diseases is very limited in most of GS programs (or other related programs like CTS), the following assumptions exclude any vascular skills and knowledge. Following are the basic competence required by a vascular surgeon/specialist, but the list is not comprehensive.

The candidates selected to under go three (3) year training leading to DNB-PVS are expected to be **already** proficient in:

1. **Basic Surgical Knowledge:**
   - Anatomy – structural and applied, embryological, anatomical anomalies and their clinical significance
   - Physiological principles in surgical patients in normal and diseased patients, including acid-base balance, electrolyte balance and management of fluids, blood products
   - Pathological principles of surgical diseases, including microbiology
   - Pharmacology and usage of various drugs, their prescriptions in acutely and chronically ill surgical patients
   - Principles of diagnostic and imaging modalities

2. **Evaluation of Surgical patients**
   - Comprehensive clinical assessment including history, physical examination and arriving at a provisional and differential diagnosis

- Obtaining further diagnostic work up and formulating a management plan
- Able to “triage” the patient requiring routine, chronic, acute, immediate and urgent care
- Patient risk stratification and appropriate referral/or obtaining support from other services
- Evaluation and early treatment of patients with multiple trauma and other emergencies

3. Basic surgical skills

- Follow OT protocols and etiquette for logistic functioning and maintenance sterile environment
- Basics in anesthesia – local, regional and general
- Preparing the patient and oneself for the scheduled procedure
- Handling of tissues and instruments safely
- Able to assist and /or perform basic to some advanced surgical procedures commensurate with the level of training
- Hemostasis and handling of blood vessels
- Peri/postoperative patient management

4. Post operative Care & Follow up:

- Composite of above principles to be continued in post operative period
- Appropriate post operative, mid and long term pharmacotherapy dictated by patient’s procedures, comorbidities, including incision and wound care
- Assess complications and appropriate approach to these
- Appropriate long term post procedural follow up dictated by patient’s diagnosis and therapy

5. Ethics & Inter-personal relationships

- Consummate in ethical practice in all aspects of patient assessment, diagnostic work up, referral pattern to other doctors, prescription of medications and offering therapeutic options to patient and family, prudent use of resources (financial and otherwise), maintenance of patient-doctor confidentiality

- Careful and caring counseling of patient and family about diagnostics, procedures, outcomes and complications
- Maintaining excellence in interpersonal relationship with colleagues, peers and the staff

"A SURGEONS SKILLS ARE MEASURED

BY THE WAY HE HANDLES BLOOD VESSELS"

William Halstead

The Syllabus outlined below should satisfy the Program goal & Objectives detailed earlier in this document. This is structured to assure that the trainee will gain exposure to entire expanse of vascular diseases in a progressive manner starting with basics in patient care in the beginning to treating complex vascular problems at the time of completion. The Syllabus has flexibility to allow changing trends in disease pattern and therapies, especially in rapidly progressing endovascular techniques. Care of vascular diseases is indeed challenging because of systemic involvement of variable degrees and the Syllabus encourages exposure to other specialty fields impacting the vascular patients. Since the range of vascular diseases is quite wide, it is likely the trainee will develop special interest in an area in this vast specialty and he/she might seek further training in these chosen fields, even after completion of this course.

The following lists the "other" specialties the trainee preferably should possess at least basic knowledge. These can be in the same hospital or through another, preferably a teaching institution. The "postings" and the recommended length of posting can be varied at discretion of the course director. These can be spread over the three (3) years, again at the discretion of program director.

1. **Cardio thoracic surgery:** mostly to gain experience in sternotomy, thoracotomy and surgical repair intra thoracic and thoraco abdominal aneurysms and other problems relating to these vessels - **One (1) month/4 weeks**
2. **Radiology:** To obtain basic knowledge and principles of CT and MR imaging including angiogram. It is assumed that conventional angiogram/DSA are part vascular departmental training – **Two (2) weeks.**

3. **Non invasive Vascular studies:** Includes Duplex scanning, physiological studies, if facilities do not exist within the vascular department – **Two (2) weeks**
4. **Proficiency in wound care**, especially diabetic foot, venous ulcers, non-specific foot ulcers as these percolate towards vascular surgeons and most of the revascularization procedures are performed for ischemic foot. This could be within the vascular department itself or if sent for "outside posting" for the recommended duration – **Two (2) weeks**
5. **Intensive Care:** Exposure general i(surgical) intensive care unit is very desirable as most vascular patients need ICU monitoring because of multisystem involvement – **Two (2) weeks**
6. **Rotation through other Vascular Units:** Optional – rotation through other teaching vascular units across the country – **Two (2) weeks**
7. **Advanced exposure:** If possible witness robotic (vascular or other) and laparoscopic vascular procedures. These are rare and done in only few centres

The total time spent in the above would be maximum 14 weeks over the 3-year program, if all of the above rotations are utilized. To reiterate, some of these are already part of vascular units and may not need outside postings.

Structured, tier system of training, education and competence
For DNB-PVS:

This curriculum is formulated to provide the trainees with progressive, layered exposure and hands-on experience in treating vascular diseases. Required knowledge, competence and skills are graded as outlined below. The expected grades for each of the 3 years of training (divided in to 6 halves) are tabulated against subjects and areas in evaluation and therapy of vascular disease. This grading might also help in evaluating/assessing them at different stages of their training. It is assumed all are performed under guidance/presence of a Consultant Vascular Surgeon, who will also determine the scope and definition of simple, advanced and complex procedures. Grading also defines the level of knowledge required in other clinical and nonclinical aspects..

The Grading will be in 5 levels, L1 to L5

1. **Level 0/1 (L-0/1):** Not required to posses' adequate knowledge, skills and proficiency, but desirable.
2. **Level 1 (L-1):** Should possess' basic knowledge, skills and proficiency to evaluate a patient, formulate basic therapeutic plan under supervision and perform minor procedures with assistance. Able to recognize complications
3. **Level 2 (L-2):** Should possess complete "text book" theoretical knowledge of the disease, skills and proficiency to completely evaluate the patient, risk stratification, formulate appropriate diagnosis/differential diagnosis, order appropriate diagnostic tests in consultation with senior colleagues, able to perform listed procedures – some independently and others with assistance/supervision, as determined by the consultant staff depending on individual skills. Able to recognize complications and provide initial diagnostic evaluation and therapy
4. **Level 3 (L–3):** Should be adept in thorough evaluation of patients, thorough knowledge of the diseases, risk stratification. Advanced theoretical knowledge including recent advances from Journal and updates from national/international conferences. Able to order diagnostic work up independently, formulate treatment plan for the patient and present it to consultants. Able to perform procedures (simple and advanced) independently and assist in complex procedures. Able to assist junior colleagues with listed procedures. Able to treat complications, interventional or otherwise, along with senior staff.
5. **Level 4 (L–4):** In addition to level 3, able to perform parts of complex procedures and assist younger colleagues with advanced procedures.
6. **Level 5 (L–5):** Proficiency in all of the above levels, to the level of consultant vascular surgeon. Skills and knowledge adequate to be a vascular specialist as an independent practitioner/teacher

Period	**0 to 6 months**	**6 to 12**	**12 to 18**	**18 to 24**	**24 to 30**	**30 to 36**	**COMMENTS**
SECTION I: Clinical	**L2**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category**

Examination							**means full knowledge**
SECTION II: History of Vascular Surgery	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**
SECTION III: Embryology of Vascular System	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**
SECTION IV: Anatomy, physiology, pharmacology of vascular wall	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**
SECTION V: Applied anatomy and surgical exposures of vascular system	**L1**	**L2**	**L3**	**L4**	**L4**	**L5**	
SECTION VI: Epidemiology, general screening, surveillance and clinical analysis.	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**

SECTION VII: Hemostasis and thrombosis; hyper-coagulable states	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**
SECTION VIII: Pathology, Pathogenesis, patho - physiology							**L2 in these category means full knowledge**
1. Congenital anomalies	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
2. Arteriogenesis, angiogenesis	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
3. Atherosclerosis and atherogenesis	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
3. Smoking and vascular diseases	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
4. Diabetes and Vascular diseases, neuropathies	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
5. Lipid metabolism &	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	

Hyperlipidemia							
6. Hypertension	**L1**	**L1**	**L1**	**L1**	**L1**	**L1**	
7. Venous diseases – varicose veins, CVI, VTE	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
8. Lymphedema	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in the above category means full knowledge**
SECTION IX: Medical management of Vascular Diseases					**Each trainee should reach highest level of proficiency at the end of the program**		
1. Diabetes and hypertension	**L1**	**L1**	**L1**	**L1**	**L1**	**L1**	
2. Smoking cessation	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
3. Lipid lowering agents	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
4. Antiplatelets	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
5. Anticoagulants, thrombolytics	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
6. Circulation enhancing drugs, exercise	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	

therapy							
7. Conservative management of venous diseases	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
8. Conservative therapy for Lymphedema	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION X: Hemodynamics of venous and arterial systems	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in the above category means full knowledge**
SECTION XI: Non invasive physiological vascular testing	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	**L2 in the above category means full knowledge**
SECTION XII: Duplex Ultrasonography	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION XIV: Vascular Imaging							
1. Conventional angiography, DSA	**L1**	**L2**	**L3**	**L3**	**L4**	**L5**	
2. MRI and angiography	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	

3. CT and angiography	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION XV: Diabetic Foot Care and wound management							
1. Assessment – clinical (including classifications) radiological, neuropathic, ischemic	**L1**	**L2**	**L3**	**L3**	**L4**	**L5**	
2. Biomechanics, orthotics, offloading techniques, prosthetics	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
3. Wound care of limbs – arterial, venous, other wounds	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION XVI: Perioperative /procedural and Follow-up care					**Each trainee should reach highest level of proficiency at the end of the program**		
1. Pre	**L1**	**L2**	**L3**	**L3**	**L4**	**L5**	

procedural assessment and management; regional blocks/local anesthesia							
2. Intra operative/procedural care	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
3. Post operative care	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
4. Long term follow up (beyond 30 days) and surveillance	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
SECTION XVII: Vascular Complications					**Each trainee should reach highest level of proficiency at the end of the program**		
1. Systemic complications > Cardiac >Respiratory > Renal > Others	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
2. Local complications Surgery– > Graft	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	

infections, bleeding, thrombosis, anastomotic aneurysms, fistulae							
3. Local complications - > Endovascular – puncture site complications, thrombosis, dissection and others	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
3. Local/regional complications - General: Intimal hyperplasia, Ischemia-reperfusion, atheroembolism compartment syndromes	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
Vascular Conduits: >Autologous	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	

venous, arterial grafts >Allografts >Synthetic/prosthetic grafts							
Endovascular Tools: Arterial access, guide wires, catheters, balloons, stents stentgrafts	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION XVIII: Vascular Techniques:				**Each trainee should reach highest level of proficiency at the end of the program**			

Open surgical – vein harvesting, suturing, anastomotic techniques, thrombo-embolectomy, bypass procedures, endarterectomy	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Endovascular – diagnostic, therapeutic	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Hybrid procedures	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XIX: Venous Diseases:				**Each trainee should reach highest level of proficiency at the end of the program**			
Venous thromboembolism: 1. Patho-physiology, natural history	**L1**	**L2**	**L3**	**L3**	**L4**	**L5**	

2. Diagnosis, prevention and all aspects of therapies							
Interventional therapy for VTE – thrombolytic, mechanical, surgical (including IVC filters)	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XX: **Chronic Venous disorders & occlusion**				**Each trainee should reach highest level of proficiency at the end of the program**			
Non operative treatment	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
Varicose Veins – surgical, endovenous, other ablative procedures	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Venous obstruction – surgical, endovascular therapies	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Portal, mesenteric and other visceral venous disorders	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XXI: **Vascular Malformations/anomalies**							
Congenital: >Classifications, natural history	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
Therapeutic options – conservative, surgical, endovascular	**L1**	**L2**	**L3**	**L3**	**L4**	**L5**	
	L1	**L2**	**L3**	**L3**	**L4**	**L5**	
				Each trainee should reach highest level of proficiency at the end of the program			
	L1	**L1**	**L2**	**L3**	**L3**	**L3**	

	L1	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XXIII: **Non-atherosclerotic vascular diseases**							
Vasculitis and uncommon arteriopathies, arteritis	**L1**	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XXIV: TAO/Buergers disease:				**Each trainee should reach highest level of proficiency at the end of the program**			
> Classifications, risk factors, general considerations	**L2**	**L3**	**L4**	**L5**	**L5**	**L5**	
> Surgical/interventional therapies, including thoracic and lumbar sympathectomies	**L2**	**L3**	**L4**	**L5**	**L5**	**L5**	
	L1	**L2**	**L3**	**L4**	**L5**	**L5**	
SECTION XXV: **Lower Extremity chronic Arterial Occlusive diseases**						**Each trainee should reach highest level of proficiency at the end of the program**	

> General considerations – epidemiology, natural history including limb and patients, systemic risks and stratifications, classifications	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	**L3 in this category means full knowledge**
> Diagnostic modalities, decision making, follow up protocols, outcome predictors and analysis	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	**L3 in this category means full knowledge**
> Medical therapies – local, systemic, exercise programs; others including cell based therapies	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	**L3 in this category means full knowledge**
Aorto iliac reconstruction – surgical, endovascular	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Femoral popliteal reconstructions – surgical and endovascular	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Infra popliteal reconstruction, including pedal vessels – surgical and endovascular	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
> Multilevel reconstructions	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
> "Hybrid" – combined surgical and endovascular procedures	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Post procedural surveillance, medical therapy, re-interventions	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Lower Extremity debridements and	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	

amputations at all levels							
SECTION XXVI: **Upper limb arterial diseases, including TOS**							
> General considerations including pathogenesis	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
> Revascularization – Surgical, Endovascular	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
> Vasospastic and other disorders	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
> TOS – Arterial, Venous, Neurogenic	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
SECTION XXVII: **Vascular Trauma:**							
> Epidemiology, natural history, early evaluation in isolated and multiply injured patient, resuscitation	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Vascular trauma lower and upper extremities	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Vascular Trauma head and neck	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Vascular trauma - Trunk	**Lo/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
SECTION XXVIII: **Acute Limb Ischemia**				**Each trainee should reach highest level of proficiency at the end of the program**			

Clinical evaluation, assess etiology, diagnostics, staging, early therapy	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Surgical, endovascular, combined therapy, including intra procedural angiogram	**L1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Prevention, diagnosis and treatment of reperfusion syndromes	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Post procedural therapy, surveillance	**L1**	**L2**	**L3**	**L4**	**L5**	**L5**	
Section XXIX: **Abdominal aortic aneurysms**				**Trainee may require further exposure to high volume center or pursue further training**			
General consideration, evaluation and decision making	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
	L0/1	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
	L0/1	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
Emergency repair	**L0/1**	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
SECTION X **Thoracic aortic aneurysms and dissection**				**Trainee may require further exposure to high volume center or pursue further training**			

General consideration, evaluation and decision making	**L0/1**	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
Open surgical treatment	**L0/1**	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
Endovascular, hybrid procedures	**L0/1**	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	
Emergency repair	**L0/1**	**L1**	**L2**	**L2/3**	**L2/3**	**L2/3**	

SECTION XXXI: **Peripheral and Visceral aneurysms**							
Extremity aneurysms	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Visceral aneurysms	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Infected/mycotic aneurysms	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	
Other aneurysms – connective tissue related, anastomotic, pseudo aneurysms, mural ulcers	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L5**	

SECTION XXXII: **Cerebrovascular diseases**							
> General considerations, evaluation	**L0/1**	**L1**	**L2**	**L2**	**L2**	**L2**	**L2 in this category means full knowledge**
> Decision making and medical therapy	**Lo/1**	**L1**	**L2**	**L2**	**L2**	**L2**	
Carotid endarterectomy	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L4**	**Trainee may**

Carotid stenting	**L0/1**	**L1**	**L2**	**L3**	**L4**	**L4**	**require further exposure to high volume center or pursue further training**
Other supra aortic arch diseases	**L0/1**	**L1**	**L2**	**L2**	**L3**	**L4**	
	L1	**L2**	**L3**	**L4**	**L5**	**L5**	
SECTION XXXIII: Mesenteric Vascular Diseases							
> General considerations – etiology, pathophysiology, evaluation – clinical diagnostic	**L1**	**L2**	**L3**	**L3**	**L3/4**	**L4/5**	
> Acute mesenteric ischemia diagnostic approaches and intervention (surgical, endovascular)	**L1**	**L2**	**L3**	**L3**	**L3/4**	**L4/5**	
> Chronic Mesenteric Ischemia – general considerations, diagnostic approaches and interventions (surgical, endovascular)	**L1**	**L2**	**L3**	**L3**	**L3/4**	**L4/5**	

SECTION XXXIV: **Renovascular diseases** – diagnosis, interventions	**L1/0**	**L1**	**L2**	**L2**	**L3**	**L3**	
SECTION XXXV: **Lymphedema** – Diagnosis and management	**L1**	**L2**	**L3**	**L3**	**L3**	**L3**	
SECTION XXXVI: **Miscellaneous**					**L2 in this category means full knowledge**		
Biostatistics, Research Methodology and Clinical Epidemiology	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
Ethics and Medico legal aspects relevant to vascular diseases and treatment	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	
Health Policy issues relevant to vascular diseases	**L1**	**L2**	**L2**	**L2**	**L2**	**L2**	

THESIS AND ITS PROTOCOL

The candidates are required to submit a thesis at the end of three years of training as per the rules and regulations of NBE.

Guidelines for Submission of Thesis Protocol & Thesis by candidates

Research shall form an integral part of the education programme of all candidates registered for DNB degrees of NBE. The Basic aim of requiring the candidates to write a thesis protocol & thesis/dissertation is to familiarize him/her with research methodology. The members of the faculty guiding the thesis/dissertation work for the candidate shall ensure that the subject matter selected for the thesis/dissertation is **feasible, economical** and **original**.

Guidelines for Thesis Protocol

The protocol for a research proposal (including thesis) is a study plan, designed to describe the background, research question, aim and objectives, and detailed methodology of the study. In other words, the protocol is the 'operating manual' to refer to while conducting a particular study.

The candidate should refer to the NBE Guidelines for preparation and submission of Thesis Protocol before the writing phase commences. The minimum writing requirements are that the language should be clear, concise, precise and consistent without excessive adjectives or adverbs and long sentences. There should not be any redundancy in the presentation.

The development or preparation of the Thesis Protocol by the candidate will help her/him in understanding the ongoing activities in the proposed area of research. Further it helps in creating practical exposure to research and hence it bridges the connectivity between clinical practice and biomedical research. Such research exposure will be helpful in improving problem solving capacity, getting updated with ongoing research and implementing these findings in clinical practice.

Research Ethics: Ethical conduct during the conduct and publication of research is an essential requirement for all candidates and guides, with the primary responsibility of ensuring such conduct being on the thesis guide. Issues like Plagiarism, not maintaining the confidentiality of data, or any other distortion of the research process will be viewed seriously. The readers may refer to standard documents for the purpose.

The NBE reserves the right to check the submitted protocol for plagiarism, and will reject those having substantial duplication with published literature.

PROTOCOL REQUIREMENTS

1. All of the following will have to be entered in the online template. The thesis protocol should be restricted to the following word limits.

- Title : 120 characters (with spacing) page
- Synopsis [structured] : 250-300
- Introduction : 300-500
- Review of literature : 800-1000

- Aim and Objectives : Up to 200
- Material and Methods : 1200-1600
- 10-25 References [ICMJE style]

2. It is mandatory to have ethics committee approval before initiation of the research work. The researcher should submit an appropriate application to the ethics committee in the prescribed format of the ethics committee concerned.

Guidelines for Thesis

1. The institutional ethics committee must approve the proposed study and NBE should have approved the protocol of thesis.

2. The thesis should be restricted to the size of 80 pages (maximum). This includes the text, figures, references, annexures, and certificates etc. It should be printed on both sides of the paper; and every page has to be numbered. Do not leave any page blank. To achieve this, following points may be kept in view:

    a. The thesis should be typed in 1.5 space using Times New Roman/Arial/ Garamond size 12 font, 1" margins should be left on all four sides. Major sections viz., Introduction, Review of Literature, Aim & Objectives, Material and Methods, Results, Discussion, References, and Appendices should start from a new page. Study proforma (Case record form), informed consent form, and patient information sheet may be printed in single space.
    b. Only contemporary and relevant literature may be reviewed. Restrict the introduction to 2 pages, Review of literature to 10-12 pages, and Discussion to 8-10 pages.
    c. The techniques may not be described in detail unless any modification/innovations of the standard techniques are used and reference(s) may be given.
    d. Illustrative material may be restricted. It should be printed on paper only. There is no need to paste photographs separately.

3. Since most of the difficulties faced by the residents relate to the work in clinical subject or clinically-oriented laboratory subjects, the following steps are suggested:
    a. The number of cases should be such that adequate material, judged from the hospital attendance/records, will be available and the candidate will be able to collect case material within the period of data collection, i.e., around 6-12 months so that he/she is in a position to complete the work within the stipulated time.
    b. The aim and objectives of the study should be well defined.
    c. As far as possible, only clinical/laboratory data of investigations of patients or such other material easily accessible in the existing facilities should be used for the study.
    d. Technical assistance, wherever necessary, may be provided by the department concerned. The resident of one specialty taking up some problem related to some other specialty should have some basic knowledge about the subject and he/she should be able to perform the investigations independently, wherever some specialized laboratory investigations are required a co-guide may be co-opted from the concerned investigative department, the quantum of laboratory

work to be carried out by the candidate should be decided by the guide & co-guide by mutual consultation.

4. The clinical residents are not ordinarily expected to undertake experimental work or clinical work involving new techniques, not hitherto perfected OR the use of chemicals or radioisotopes not readily available. They should; however, be free to enlarge the scope of their studies or undertake experimental work on their own initiative but all such studies should be feasible within the existing facilities.

5. The DNB residents should be able to freely use the surgical pathology/autopsy data if it is restricted to diagnosis only, if however, detailed historic data are required the resident will have to study the cases himself with the help of the guide/co-guide. The same will apply in case of clinical data.
6. Statistical methods used for analysis should be described specifically for each objective, and name of the statistical program used mentioned.

General Layout of a DNB Thesis

- **Title-** A good title should be brief, clear, and focus on the central theme of the topic; it should avoid abbreviations. The Title should effectively summarize the proposed research and should contain the PICO elements.
- **Introduction-** It should be focused on the research question and should be directly relevant to the objectives of your study.

- **Review of Literature -** The Review should include a description of the most relevant and recent studies published on the subject.

- Aim and Objectives - The 'Aim' refers to what would be broadly achieved by this study or how this study would address a bigger question / issue. The 'Objectives' of the research stem from the research question formulated and should at least include participants, intervention, evaluation, design.

- **Material and Methods-** This section should include the following 10 elements: Study setting (area), Study duration; Study design (descriptive, case-control, cohort, diagnostic accuracy, experimental (randomized/non-randomized)); Study sample (inclusion/exclusion criteria, method of selection), Intervention, if any, Data collection, Outcome measures (primary and secondary), Sample size, Data management and Statistical analysis, and Ethical issues (Ethical clearance, Informed consent, trial registration).

- **Results-** Results should be organized in readily identifiable sections having correct analysis of data and presented in appropriate charts, tables, graphs and diagram etc.

- **Discussion–**It should start by summarizing the results for primary and secondary objectives in text form (without giving data). This should be followed by a comparison of your results on the outcome variables (both primary and secondary) with those of earlier research studies.

- **Summary and Conclusion-** This should be a précis of the findings of the thesis, arranged in four paragraphs: (a) background and objectives; (b) methods; (c) results;

and (d) conclusions. The conclusions should strictly pertain to the findings of the thesis and not outside its domain.

- **References-** Relevant References should be cited in the text of the protocol (in superscripts).

- **Appendices -**The tools used for data collection such as questionnaire, interview schedules, observation checklists, informed consent form (ICF), and participant information sheet (PIS) should be attached as appendices. Do not attach the master chart.

Thesis Protocol Submission to NBE

1. DNB candidates are required to submit their thesis protocol within 90 days of their joining DNB training.

2. Enclosures to be submitted along with protocol submission form:
    a) Form for Thesis Protocol Submission properly filled.
    b) Thesis Protocol duly signed.
    c) Approval letter of institutional Ethical committee. *(Mandatory, non receivable of any one is liable for rejection)*

Thesis Submission to NBE

1. As per NBE norms, writing a thesis is essential for all DNB candidates towards partial fulfillment of eligibility for award of DNB degree.
2. DNB candidates are required to submit the thesis before the cut-off date which shall be 30th June of the same year for candidates appearing for their scheduled December final theory examination. Similarly, candidates who are appearing in their scheduled June DNB final examination shall be required to submit their thesis by 31st December of preceding year.
3. Candidates who fail to submit their thesis by the prescribed cutoff date shall NOT be allowed to appear in DNB final examination.
4. Fee to be submitted for assessment (In INR): 3500/-
5. Fee can be deposited ONLY through pay-in-slip/challan at any of the Indian bank branch across India. The challan can be downloaded from NBE website www.natboard.edu.in
6. Thesis should be bound and the front cover page should be printed in the standard format. A bound thesis should be accompanied with:
    a. A Synopsis of thesis.
    b. Form for submission of thesis, duly completed
    c. NBE copy of challan (in original) towards payment of fee as may be applicable.
    d. Soft copy of thesis in a CD duly labeled.
    e. Copy of letter of registration with NBE.

7. A declaration of thesis work being bonafide in nature and done by the candidate himself/herself at the institute of DNB training need to be submitted bound with thesis. It must be signed by the candidate himself/herself, the thesis guide and head of the institution, failing which thesis shall not be considered.

The detailed guidelines and forms for submission of Thesis Protocol & Thesis are available at www.natboard.edu.in.thesis.php.

LOG BOOK

The “LOGBOOK” maintained by the candidate in DNB-PVD should comprehensively reflect the various aspects of training throughout the 3-year course, with documented evidence in the following:

1. Complete profile of the candidate
2. Complete documentation of candidates work-performance in the Operating Theaters (OTs)
3. Document the “in-house teaching” programs attended by the trainee
4. Document non-invasive procedures and Duplex scans performed.
5. Document radiological diagnostic studies - DSA/angiograms, MRA, CTA the candidate was involved in
6. Document the studies/articles submitted and accepted in peer reviewed journals
7. List the presentations (papers and/or posters) presented and/or accepted in national international vascular/surgical or other conferences
8. List other academic activities – eg. Workshops attended/conducted
9. The logbook should be certified by the concerned postgraduate teacher / Head of the department / senior consultant.
10. This logbook shall be made available to the board of examiners for their perusal at the time of the final examination.
11. Every candidate, at the time of practical examination, will be required to produce performance record (logbook) containing all details outlined above
12. In the absence of production of logbook, the result will not be declared

Leave Rules

1. DNB Trainees are entitled to leave during the course of DNB training as per the Leave Rules prescribed by NBE.
2. A DNB candidate can avail a maximum of 20 days of leave in a year excluding regular duty off/ Gazetted holidays as per hospital/institute calendar/policy.
3. MATERNITY LEAVE:
    a. A female candidate is permitted a maternity leave of 90 days once during the entire duration of DNB course.
    b. The expected date of delivery (EDD) should fall within the duration of maternity leave.
    c. Extension of maternity leave is permissible only for genuine medical reasons and after prior approval of NBE. The supporting medical documents have to be certified by the Head of the Institute/hospital where the candidate is undergoing DNB training. NBE reserves its rights to take a final decision in such matters.
    d. The training of the candidate shall be extended accordingly in case of any extension of maternity leave being granted to the candidate.
    e. Candidate shall be paid stipend during the period of maternity leave. No stipend shall be paid for the period of extension of leave.
4. Male DNB candidates are entitled for paternity leave of maximum of one week during the entire period of DNB training.
5. No kind of study leave is permissible to DNB candidates. However, candidates may be allowed an academic leave as under across the entire duration of training program to attend the conferences/CMEs/Academic programs/Examination purposes.

DNB COURSE	**NO. OF ACADEMIC LEAVE**
DNB 3 years Course (Broad & Super Specialty)	14 Days
DNB 2 years Course (Post Diploma)	10 Days
DNB Direct 6 years Course	28 days

6. Under normal circumstances leave of one year should not be carried forward to the next year. However, in exceptional cases such as prolonged illness the leave across the DNB training program may be clubbed together with prior approval of NBE.
7. Any other leave which is beyond the above stated leave is not permissible and shall lead to extension/cancellation of DNB course.

8. Any extension of DNB training for more than 2 months beyond the scheduled completion date of training is permissible only under extra-ordinary circumstances with prior approval of NBE. Such extension is neither automatic nor shall be granted as a matter of routine. NBE shall consider such requests on merit provided the seat is not carried over and compromise with training of existing trainees in the Department.
9. Unauthorized absence from DNB training for more than 7 days may lead to cancellation of registration and discontinuation of the DNB training and rejoining shall not be permitted.
10. Medical Leave
    a. Leave on medical grounds is permissible only for genuine medical reasons and NBE should be informed by the concerned institute/hospital about the same immediately after the candidate proceeds on leave on medical grounds.
    b. The supporting medical documents have to be certified by the Head of the Institute/hospital where the candidate is undergoing DNB training and have to be sent to NBE.
    c. The medical treatment should be taken from the institute/ hospital where the candidate is undergoing DNB training. Any deviation from this shall be supported with valid grounds and documentation.
    d. In case of medical treatment being sought from some other institute/hospital, the medical documents have to be certified by the Head of the institute/hospital where the candidate is undergoing DNB training.
    e. NBE reserves its rights to verify the authenticity of the documents furnished by the candidate and the institute/hospital regarding Medical illness of the candidate and to take a final decision in such matters.
11.
    a. Total leave period which can be availed by DNB candidates is 120+28 = 148 days for 6 years course, 60+14=74 days for 3 years course and 40+10 = 50 days for 2 years course. This includes all kinds of eligible leave including academic leave. Maternity / Paternity leave can be availed separately by eligible candidates. Any kind of leave including medical leave exceeding the aforementioned limit shall lead to extension of DNB training. It is clarified that prior approval of NBE is necessary for availing any such leave.
    b. The eligibility for DNB Final Examination shall be determined strictly in accordance with the criteria prescribed in the respective information bulletin.

EXAMINATIONS

I. FORMATIVE ASSESSMENT.

Formative assessment includes various formal and informal assessment procedures by which evaluation of student's learning, comprehension, and academic progress is done by the teachers/ faculty to improve student attainment. Formative assessment test (FAT) is called as "Formative "as it informs the in process teaching and learning modifications. FAT is an integral part of the effective teaching .The goal of the FAT is to collect information which can be used to improve the student learning process.

Formative assessment is essentially positive in intent, directed towards promoting learning; it is therefore part of teaching. Validity and usefulness are paramount in formative assessment and should take precedence over concerns for reliability. The assessment scheme consists of Three Parts which has to be essentially completed by the candidates.

The scheme includes:-

Part I: Conduction of theory examination
Part-II: Feedback session on the theory performance
Part-III: Work place based clinical assessment

Scheme of Formative assessment

PART – I	**CONDUCT OF THEORY EXAMINATION**	Candidate has to appear for Theory Exam and it will be held for One day.
PART – II	**FEEDBACK SESSION ON THE THEORY PERFORMANCE**	Candidate has to appear for his/her Theory Exam Assessment Workshop.
PART – III	**WORK PLACE BASED CLINICAL ASSESSMENT**	After Theory Examination, Candidate has to appear for Clinical Assessment.

The performance of the resident during the training period should be monitored
throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student

1. Personal attributes:

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
- **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
- **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. Academic Activity: Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

II. FINAL EXAMINATION

The summative assessment of competence will be done in the form of DNB Final Examination leading to the award of the degree of Diplomate of National Board in Peripheral Vascular Surgery (DNB-PVS). This DNB final examination is a two-stage assessment of the trainee comprising the theory and practical part. An eligible candidate who has successfully completed the theory exam is permitted to appear in the practical examination in the designated centers.

Theory Examination

1. The theory examination comprises of **Three (3)** papers, maximum marks 100 each
2. There are 10 short notes of 10 marks each, in each of the papers. The number of short notes and their respective marks weightage may vary in some subjects/some papers.
3. Maximum time permitted for each paper is 3 hours.
4. The fourth (4^{th}) part of this assessment will be the average percentage of marks scored in Formative Assessment theory exam conducted in 2^{nd} and 3^{rd} years of candidates training.
5. Candidate must score at least 50% in the aggregate all of the above four theory examinations ie. should at least score 200 out of 400 marks to successfully complete this theory exam.
6. Candidates who have qualified the theory examination are permitted to take up the practical examination.
7. The paper wise distribution of the Theory Examination shall be as follows:

PAPER 1: *Sections I to Section XVIII of Core Vascular Syllabus*

PAPER 2: *Sections XIX to Section XXVII of Core Vascular Syllabus*

PAPER 3: *Sections XXVIII to XXXVI of Core Vascular Syllabus*

a) Practical Examination:

1. Maximum Marks: 400.
2. Comprises of Clinical Examination and Viva, along with evaluation of experience and academic activities as recorded in the logbook
3. Practical, Viva – 300 marks
4. Thesis 50 marks for Thesis and 50 marks for publications/presentations documented in logbook. Total 100 marks**.**
5. Candidate must obtain a minimum aggregate of 50% (ie 200 marks) in the Practical Examination as defined above to successfully complete the Practical Examination.
6. There are a maximum of three attempts that can be availed by a candidate for Practical Examination.
7. First attempt is the practical examination following immediately after the declaration of theory results.
8. Second and Third attempt in practical examination shall be permitted out of the next three sessions of practical examinations placed along with the next three successive theory examination sessions; after payment of full examination fees as may be prescribed by NBE.
9. Absence from Practical Examination is counted as an attempt.
10. Appearance in first practical examination is compulsory;
11. Requests for Change in center of examination are not entertained, as the same is not permissible.
12. Candidates are required not to canvass with NBE for above.

Declaration of DNB Final Results

1. DNB final is a qualifying examination.
2. Results of DNB final examinations (theory & practical) are declared as PASS/FAIL.
3. DNB degree is awarded to a DNB trainee in the convocation of NBE.

RECOMMENDED TEXT BOOKS AND JOURNALS

BOOKS

- **"Must" for vascular library: Hard copy/on-line:**

1. Vascular Surgery: 8th Edition. Rutherford R.B. (Ed.)
2. Vascular and Endovascular Surgery Wesley Moore – 8th edition

- **Preferable:**

1. Vascular and Endovascular Surgery: 4th Edition. Beard J.D., Gaines P.A. (Eds) Saunders Elsevier 2009
2. Comprehensive Vascular and Endovascular Surgery: 2nd Edition. Hallet J.W., Mills J.L., Earnshaw J.J., Reekers J.A., Rooke TM (Eds), Mosby Elsevier, 2009
3. Venous diseases by American Venous Forum Edited by edited by Peter Gloviczy
4. The Vein Book. Bergan J. J. (Ed.) Elsevier, 2007
5. Diabetic Foot – Levine & O'Neil
6. Yearbook of Vascular & Endovascular Surgery 2016– R. Sekhar, Jaypee brothers
7. "A Practical Approach to Vascular & Endovascular Surgery" – Jaisom Chopra, V.S.Bedi; Jaypee brothers, 2016

JOURNALS: Hard copy/on-line

- **Must for vascular departments**

1. Indian Journal of Vascular and Endovascular Surgery
2. Journal of Vascular Surgery
3. European Journal of Vascular and Endovascular Surgery

- **Preferable: Hard copy/on-line**

1. Annals of Vascular Surgery
2. Circulation
3. Journal of Vascular & Endovascular Therapy
4. Seminars in Vascular Surgery