

CURRICULUM  
FOR  
Fellowship in  
Vascular Surgery

**DHULIKHEL HOSPITAL**  
DHULIKHEL ACADEMY OF HEALTH SCIENCES

DHULIKHEL, KAVRE NEPAL  
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# Contents

Course Description	5
Overall Objectives	7
Scope of Program	8
Additional components throughout the program	11
Selection criteria	11
Period of training	12
Site of training	12
Affiliated partners for fellowship program	12
Academic regulations	13
Outline of syllabus	14
Minimal log of different procedures/ cases	16
Academic activities	17
Evaluation schemes	18
Degree	20



# Course Description

## **Fellowship Programs:**

This fellowship program in Vascular Surgery is crafted to create well trained vascular surgeon who can provide necessary services inside the country.

### **a. Goal of the programs:**

The fellowship program is prepared to train post-graduate qualified general surgeon in vascular and endovascular surgery. After two years of fellowship in vascular surgery, he/she will be able to manage a wide range of problems related to vascular surgery independently. In addition, he/she will develop skills related to endovascular surgery and vascular intervention. He/she will have good diagnostic and therapeutic skills of vascular surgery.

### **b. Expected outcome:**

At the end of the training, the candidate will be able to:

- work and practice vascular surgery with confidence and independently,
- acquire sound theoretical knowledge, and develop competency in both diagnostic and therapeutic skills.

### **c. Period of training:**

The period of training for Vascular Surgery fellowship shall be two years duration.

The trainee will have to go through full-time training as defined in the curriculum.

A Guide/supervisor will be designated for each of the trainee candidate.

**d. Training program:**

The training program is structured program with daily supervision and teaching from guide and other faculties. There will be exam for intake of candidate and fellow will be evaluated periodically (every six months). Fellowship will be awarded after meeting all the criteria along with passing of the final exam. Although, there will be regular teaching by guide, the candidates are also encouraged in “self directed” learning. Besides formal presentation session to learn on different aspects of vascular surgery, there will be learning from day to day clinical and academic activities. Candidate will actively participate in all the departmental clinical and academic activities. Candidate need to have a daily log book. Candidate also need to be involved in teaching of undergraduate and postgraduate medical students. Candidate need to contribute by doing research in topic relevant to vascular surgery and need to prepare the research findings before completion of the fellowship. Candidate is also strongly recommended to share his/her research finding in national/international conferences and/or by publication in relevant journals.

## Overall Objectives

The program aims at training of general surgeon encompassing the related knowledge, skills and research methodology in the subject of vascular surgery. The quantum of training shall be sufficient so that at the end of training period, the candidate will be able to:

- identify the clinical problems in a given patient.
- interpret the results of investigations.
- perform necessary procedures - both diagnostic and therapeutic .
- manage any complications related to procedures/ operation.

The candidate will also train others in his area with adequate knowledge, attitude and skills to function as consultants and

- help them in developing qualities of initiative, creativity, judgment and logic,
- will train them to provide academic leadership,
- help them to acquire skills in clinical research and to critically analyze scientific literature,
- ensure that they are conversant with recent advances in vascular surgery,
- train them in the art of imparting knowledge to others and be good teachers.
- develop bedside manners and infuse confidence in his/her patients,
- be fully conversant with the protocol of clinical research,
- be able to critically analyse and assimilate scientific literature,
- have the expertise to write up a scientific article and actively participate in a scientific meeting.

## Scope of Program

The following areas would be covered during training of these candidates:

- **Vascular surgical disorders that involves**

- \* Arterial diseases like peripheral arterial diseases, diseases of aorta, diseases of carotid artery.
- \* Venous diseases like varicose veins, deep vein thrombosis.
- \* Vascular anomalies including vascular tumors and vascular malformation.
- \* Dialysis access like temporary catheters, tunneled cuffed catheters, arteriovenous fistula, arteriovenous grafts.
- \* Rare vascular diseases like vasculitis.

- **Diagnostic modalities like**

- \* History and clinical findings
- \* Doppler ultrasonography
- \* CT angiogram/ MR angiogram
- \* Conventional angiogram

- **Treatment modalities like**

- \* Conservative management and lifestyle modifications for vascular diseases
- \* Medical management of vascular diseases
- \* Minimal invasive surgical modalities of vascular diseases
- \* Open surgical management of vascular diseases.



## **Breakdown of learning objectives for different months**

Although there is breakdown of different topics of vascular surgery in different months of fellowship, the fellow need to be involved in learning on all the topics from the start of fellowship. Also depending on the cases that fellow is involved, he/she need to learn on those cases from start of fellowship. The breakdown is a general guide for fellows to learn and he/she must ensure to cover these topics during regular presentation in the department.

### **Months 1-3: Foundations & Basic Skills**

- Anatomy & Physiology of the Vascular System
- Principles of Vascular Surgery & Pathophysiology
- Basic Surgical Skills & Sterile Technique
- Imaging Modalities: Doppler Ultrasound, CTA, MRA
- Introduction to Wound Care & Management of Vascular Diseases

### **Months 4-6: Diagnostic & Non-invasive Management**

- Vascular Disease Diagnosis & Evaluation
- Medical Management of Vascular Disorders
- Interventional Techniques: Angioplasty, Stenting
- Preoperative & Postoperative Patient Care
- Participation in Vascular Clinic & Outpatient Management

### **Months 7-9: Surgical Techniques & Practice**

- Open Vascular Surgical Procedures: Bypass, Endarterectomy, Aneurysm Repair

- Endovascular Procedures & Device Handling
- Intraoperative Imaging & Navigation
- Emergency Vascular Surgery: Trauma & Rupture Management

### **Months 10-12: Specialized Skills & Complex Cases**

- Management of Complex Aortic Aneurysms & Dissections
- Peripheral Arterial Disease Surgery
- Venous Surgery & Lymphatic Disorders
- Complication Management & Revascularization Strategies

### **Months 13-15: Advanced & Research Activities**

- Multidisciplinary Case Conferences
- Research & Quality Improvement Projects
- Learning New Technologies & Techniques
- Teaching & Mentoring Junior Trainees

### **Months 16-24: Independent Practice & Final Assessment**

- Management of Routine & Complex Cases
- Surgical Autonomy & Decision-Making
- Preparation for Certification & Fellowship Exams
- Evaluation & Feedback

## Additional Components Throughout the Program

- Regular Conferences & Seminars on Vascular Topics
- Participation in Vascular Surgery Society Meetings
- Supervised Surgical Log & Case Portfolio
- Assessment & Competency Evaluations

## Selection Criteria

- (a) The selection will be based according to the rules and regulation of the university or as directed.
- (b) Selection will be on merit basis.

## Period of Training

Two years

## Site of Training

Vascular surgery unit of Dhulikhel Hospital

Centers providing vascular surgery services following discussion with Vascular Society of Nepal

International centers providing vascular surgery based on feasibility of sending fellow for observation and training.

## Partners for Fellowship

Vascular Surgery Department, Carl-von-Basedow Klinikum, Merseburg, Germany

Vascular Surgery Department, Medical College of Wisconsin, USA

Vascular Society of Nepal

## Academic Regulations

Besides the rules and regulations of the university, the candidate

- should be punctual and sign an attendance register,
- should be aware of daily schedule and responsibilities,
- obey the rules and regulations of the institutions where they are working,
- perform the expected duties and take responsibilities as a unit team member,
- be permitted a total of two weeks leave in one academic year,
- get leave sanctioned by the concerned authority (i.e. head of the unit),
- inform their respective preceptor when they are sick,
- be on emergency duty as assigned by the head of the department,
- participate in OPD, OT and in-patient work as directed by his supervisor,
- be responsible for guiding and instructing his/her juniors.

# Outline of Syllabus

## Curriculum

### **Basis sciences and principles of vascular surgery**

- a. Anatomy  
Gross and histological anatomy of the blood vessels and circulatory system. Embryology of the blood vessels including normal development and congenital malformation.
- b. Physiology  
Normal functions of the blood vessels and circulatory system.
- c. Pharmacology  
Pharmacokinetics of drugs used in vascular diseases.
- d. Bleeding disorders  
Normal clotting mechanism, principles and disorders of bleeding disorders.
- e. Biostatistics  
Mean, median, mode; measures of central tendency, types of distribution tests of statistical significance, confidence intervals; sensitivity, specificity and accuracy of tests.
- f. Radiology in vascular diseases  
Role of diagnostic modalities like doppler ultrasonography, CT angiogram, MR angiogram and conventional angiogram. Principles and practice of radiology including pre/intra and postoperative doppler ultrasonography, image guided procedures like endovascular surgery, angioplasty.

- g. Vascular pathology  
Indepth knowledge on cause, risk factors, presentation, diagnosis and treatment of vascular diseases.
- h. Medical research and Clinical trials relevant to vascular diseases.
- i. Information Technology and communication skills
- j. Medical audit
- k. Recent advances, Emergency medicine

Minimal Log of Different Procedures/ Cases

1.	Bedside doppler ultrasonography	100
2.	Interpretation of CT angiogram	25
3.	Interpretation of MR angiogram	25
4.	Conduction of conventional angiogram and interpretation	25
5.	Conduction of angioplasty	25
6.	Endovascular surgery for venous diseases	50
7.	Creation of AV fistula	50
8.	Participation in preoperative planning of AV fistula salvage	25
9.	Assisting in AV fistula salvage surgery	25
10	Performing amputation due to peripheral vascular diseases	20
11	Performing surgical procedures for peripheral arterial diseases	20
12	Participation in surgery for carotid artery	5
13	Participation in surgery for aortic diseases	5
14	Participation in planning of management of vascular malformation	25
15	Participation in procedures for addressing vascular malformation	25



## Academic Activities

The emphasis will be on self-learning. The student will be guided by the preceptor and other teachers will also be involved in teaching activities.

Apart from the daily routine of OPDs, ward rounds (daily and grand rounds) and bedside discussions the following academic activities will be part of the training

- |                                     |                    |
|-------------------------------------|--------------------|
| (i) Case Presentations              | 2 per week         |
| (ii) Recent Advances / Journal Club | On alternate weeks |
| (iii) Clinical meetings             | 1 per week         |
| (iv) Data Analysis                  | 1 per week         |
| (v) Teaching Sessions               | Bedside Clinics    |

## Evaluation Scheme

There will be both formative and summative evaluation

### **Formative Evaluation**

The grading will be as follows

Grade A	-	Excellent,
Grade B	-	Good
Grade C	-	Satisfactory
Grade D	-	Poor
Grade E	-	Very poor

Candidates with Grade D will be extension of three months of training. Candidates with Grade E will be debarred from training.

Formative assessment will provide proper feed back to the student about his/her continuing performance and decide towards eligibility for appearance in the final examination at the end of the course.

Grade A or B or C will be needed to be eligible for the final examination.

### **Summative Evaluation**

Eligibility for summative evaluation

- a) Minimum of one Original research publication as main author in Indexed Journal.
- b) Grading of C or above in formative evaluation

**Theory Examination: There will be three papers.**

Each Paper: 100 marks (50Qx1marks=50 Marks + SAQ 10Qx5marks=50 Marks) Time: 3 hrs.

Paper I      Applied basic Sciences

Paper II      Current practices in sub specialty

Paper III      Recent advancement in sub specialty

**Practical / Clinical examination: Total marks**

- a) Long and short cases (1+2)  
 $50+25+25= 100$  Marks
- b) OSCE / OSPE (5 stations)       $10 \times 5 = 50$  Marks
- c) Viva voce: two tables       $25 \times 2 = 50$  Marks

**Pass for fellowship program will be**

- a) 60% of the marks of each theory and
- b) 60% of the total marks in Practical / Clinical

Evaluation of the fellowship program will be done every six months based on the course evaluation. Course evaluation form will be created. The form will include details on

1. Learning environment
2. Constructive alignment
3. General feedback
4. Tutor feedback
5. Recommendation and feedback

## Degree

The successful candidates will be awarded the degree of Fellowship in Vascular Surgery