

There are seven columns in the curriculum outline

1. Goals and objectives (G & O)- curriculum objectives are listed in this column.
2. Resources- text references (listed in separate document). This is a preliminary list which will expand to include key text references upon which the curriculum may be based. Individual programs are expected to supplement core texts with pertinent literature as needed.
3. Suggested learning activities- the definition of each activity is on page 14-15.
4. Knowledge- a check mark in this column signifies that teaching of this topic is required.
5. Clinical Experience-a check mark in this column signifies that actual clinical experience and proficiency is required in addition to knowledge.
6. Recommended proficiency interval- the 12 month fellowship is divided into four quarters (three month blocks). The suggested time frame in which each goal and objective should be met is arbitrary and programs may adjust this interval as needed.
7. Assessment methods- their definitions are on page 15-16.

### Core Curriculum for Phlebology Fellowship (ACP)

Fundamental Principles					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval (Quarter)	Suggested Assessment Methods
1. Normal venous anatomy of superficial, deep and perforating veins of the lower extremities including the great saphenous vein (GSV), saphenofemoral junction, small saphenous vein (SSV), popliteal fossa and the femoral, popliteal and tibial vessels	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Computer modules Anatomic or animal models Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Role play or Simulations Formal oral exam Anatomic or animal models
2. Anatomy of pelvic and ovarian veins	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Computer modules Anatomic or animal models Role-playing or Simulations Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Role play or Simulations Anatomic or animal models
3. Anatomy of adjacent and accompanying structures such as arteries, nerves and lymphatics	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
4. Normal venous hemodynamics and the derangements associated with chronic venous insufficiency with their varied clinical presentations.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
5. Venous disease a) Epidemiology b) Presentation c) Morbidity d) Deep vs superficial	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		2	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall Anatomic or animal models

<b>Fundamental Principles</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval (Quarter)	Suggested Assessment Methods
6. Understand the basic science of venous pathophysiology-i.e. function of normal venous endothelium and its alteration in chronic venous insufficiency (e.g. production of prostacyclin, plasminogen activator, heparans and thrombomodulin). This includes the role of the inflammatory cascade in the development of valvular damage, remodeling, and lipodermatosclerosis.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall
7. To understand the general principles (indications, contraindications, risks and benefit) of therapy (medical & surgical) for venous disease.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		2	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall
8. Understand the evaluation and management of recurrence following surgery.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		3	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall
9. Cutaneous disease associated with venous insufficiency a) To understand the characteristics of venous ulcers and be able to differentiate these from other types of ulcers including arterial, neuropathic, malignant, infectious and inflammatory. b) To be able to differentiate venous dermatitis (stasis dermatitis, atrophie blanche, lipodermatosclerosis) from other skin conditions (i.e. vasculitis, pyoderma gangrenosum, capillaritis, disseminated superficial actinic keratosis, etc) of the lower extremities.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		2	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall

<b>Fundamental Principles</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval (Quarter)	Suggested Assessment Methods
10. Lower extremity venous thrombosis a) Major risk factors, including acquired and hereditary hypercoagulable conditions. b) Thrombotic impact on normal venous patency and valvular function. c) The relationship between acute deep vein thrombosis and the eventual development of chronic venous insufficiency. d) Post-thrombotic versus postphlebotic e) Superficial thrombophlebitis, deep venous thrombosis and pulmonary embolism	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		2	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall
11. Understand the presentation, diagnosis, and management (medical and surgical) of primary and secondary subclavian/axillary vein thrombosis.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
12. To understand and differentiate the 3 etiologic categories of venous dysfunction; Congenital, primary, and secondary (post-thrombotic or post traumatic).	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Standardized patient Review of case or procedure log Review of patient chart / record
13. Understand the lymphatic system and the pathophysiology of its dysfunction	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Standardized patient Review of case or procedure log Review of patient chart / record

<b>Fundamental Principles</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval (Quarter)	Suggested Assessment Methods
14. Definitions& implications of: a) Chronic Venous Insufficiency b) Varicose veins c) Perforating veins d) Telangiectasia e) Sclerotherapy f) Lipodermatosclerosis g) Atrophie blanche h) Venous claudication i) Phlegmasia cerulea dolens j) Phlegmasia alba dolens k) May-Thurner Syndrome l) Klippel-Trenaunay Syndrome m) Parks-Weber Syndrome n) Reticular veins o) Ambulatory venous hypertension p) Chronic venous disorder q) Lipedema r) Lymphedema s) Pelvic Venous Congestion t) Virchow's triad	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		2	Clinical performance ratings Focused observation & evaluation Role play or Simulations Stimulated chart recall

<b>Diagnostic Evaluation</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
1. To properly perform a focused history and physical examination on the patient with venous disease.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Standardized patient Individual or group projects Textbook readings	X	X	2	Clinical performance ratings Focused observation & evaluation
2. To understand, perform, interpret, and document noninvasive evaluations for lower extremity reflux testing (diagnosis of superficial, perforator, deep or combined venous insufficiency) and for deep venous thrombosis. Specifically, proficiency in these methods is expected; a. Duplex ultrasonography b. Ankle-brachial index	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
3. To have knowledge of adjunctive diagnostic procedures including manual Doppler exam and photoplethysmography		X		4	
4. Understand methods used to evaluate venous/lymphatic malformations, pelvic venous congestion and venous obstruction.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
5. Understand the role for other imaging modalities such as; MR angiography, CT angiography, venography.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes

<b>Diagnostic Evaluation</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
6. To understand the use of transillumination and infrared imaging for mapping of reticular and/or varicose veins.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Standardized patients Individual or group projects Textbook readings	X	X	2	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
7. To understand the indication for peripheral arterial system evaluation and what diagnostic studies are available.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X		1	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart/recall
8. To understand and utilize the updated CEAP classification (J Vasc Surg. 2004 Dec;40(6):1248-52) of venous insufficiency in the integration of clinical and radiologic findings.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart/recall
9. Evaluation of hypercoagulable states	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart/recall

<b>Treatment</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
1. Medical therapy including pharmacologic agents, antibiotics, skin substitutes, and topical wound care products and growth factors.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart/record Review of patient outcomes
2. Compression therapy (bandaging systems and stockings).	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Standardized patient Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation
3. Anesthesia techniques related to venous therapy including local and tumescent anesthesia, anxiolysis.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	2	Clinical performance ratings Focused observation & evaluation
4. Visual sclerotherapy (liquid and foam variations)	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Standardized patient Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation

<b>Treatment</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
5. Duplex guided sclerotherapy	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Standardized patient Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation
6. Ambulatory phlebectomy	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
7. Endovenous ablation (i.e. endovenous laser, endovenous radiofrequency, endovenous chemical ablation, catheter based therapy)	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
8. Cutaneous laser surgery and its role in the treatment of telangiectasias and reticular veins	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
9. The fellow should have knowledge of vein stripping and perforator treatment techniques and their respective roles in venous therapy	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		3	Clinical performance ratings Focused observation & evaluation

<b>Treatment</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
10. The fellow should have knowledge of the management of pelvic venous insufficiency	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
11. Understand the principles in managing venous/lymphatic malformations and anomalies	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall
12. To be able to describe the procedures used for treatment of deep venous reflux and/or obstruction including valvuloplasty, vein and valve transplantation and vein segment transposition	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation
13. Recognize and manage perioperative complications related to venous procedures such as; pain, phlebitis, hematoma, infection, allergic reactions, thromboembolism, ulceration, events associated with foam sclerotherapy	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
14. Recognize the indications for consultation and referral to other specialists, especially in the event of intra-arterial injections and venous thrombosis.	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		3	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes

<b>Adjunctive Education</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
1. Ethics Training	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Standardized patient Individual or group projects Textbook readings Role modeling	X		3	Clinical performance ratings Focused observation & evaluation Standardized patient Review of case or procedure log Review of patient chart / record 360 Degree assessment
2. Vascular Laboratory development	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Standardized patient Review of case or procedure log Review of patient chart / record
3. Documentation and Billing for venous disease	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record
4. Basic and Advanced Cardiac Life Support	Certification course High tech simulators/simulations Departmental conferences, lectures, or discussions Computer models Role-playing or Simulations Textbook readings	X	X	1	Formal Oral exam Stimulated chart recall In training examination

<b>Adjunctive Education</b>					
Goals and objectives	Suggested Learning Activities	Knowledge	Clinical Experience	Recommended proficiency interval	Suggested assessment methods
5. Quality Assurance (QA) process	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
6. Quality Improvement (QI) program	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
7. Research design and analysis	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Institutional conferences, lectures, or discussions Individual or group projects Textbook readings	X	X	2	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes
8. Quality of life indicators as related to venous disease; Venous Clinical Severity Score, Venous disability score, Venous Segmental Disease Score, as well as general and venous-specific QoL scales	Clinical teaching Clinical experiences Departmental conferences, lectures, or discussions Individual or group projects Textbook readings	X		4	Clinical performance ratings Focused observation & evaluation Stimulated chart recall Review of patient chart / record Review of patient outcomes

## Glossary of terms ([http://www.ACGME.org/pifoutcome/pifoutcome\\_glossary.asp](http://www.ACGME.org/pifoutcome/pifoutcome_glossary.asp))

### Instructional Methods

1. Clinical Teaching - teaching that occurs in the clinic, EDs, ORs, laboratories, or other medical settings and addresses issues related to residents' current patient cases or clinical responsibilities.
2. Clinical Experiences - direct, hands-on clinical or patient care activities. This may include surgery, patient exams, the reading of radiographs and preparation of pathology assays.
3. Performance Feedback - information provided to a resident that describes what (s)he has done well or poorly and provides specific guidance as to how performance might be improved.
4. Departmental Conferences, Lectures or Discussions - formal, classroom instruction on a specific topic or method, led by one or more faculty, residents, or staff, etc.
5. Institutional Conferences, Lectures, or Discussions - formal educational event involving institution-sponsored grand rounds, lectures, discussions, or workshops for residents and/or faculty from multiple specialties; may be part of an institutional core curriculum (i.e. a set or course of learning activities arranged to impart knowledge and skills in fundamental domains, for example, communication skills, legal issues, ethics).
6. Individual or Group Projects - multi-step, multi-component tasks performed as vehicles for learning and applying knowledge and skills. Projects should result in a product. Examples are literature reviews, research, clinical quality improvement projects, and community health advocacy work.
7. Computer Modules - computer-based instructional units that present medical knowledge or clinical tasks, etc, that residents work through independently. These modules are developed either by the institution/program or purchased from commercial vendors.
8. Standardized Patients - professional actors or real patients trained to present realistically and reliably a medical condition and/or specific patient behaviors; the standardized patient provides instruction to the resident or feedback about his/her performance
9. High-Tech Simulators/Simulations - 3-dimensional, high tech, computerized devices that represent human anatomy and physiological responses (simulators) are used by residents to learn procedures and operations. Or realistic patient care scenarios are generated using high tech/virtual reality devices (simulations). Residents engage in the scenario as in real life to learn or apply clinical or teamwork skills.
10. Anatomic or Animal Models - non-computerized, 3-dimensional devices that replicate the properties of human anatomical structures are used by residents to learn procedures.
11. Role Play or Simulations - staged replicas of potentially real situations are engaged in by residents to learn, practice or rehearse skills needed in those situations. This method is often used in difficult or high-risk situations, e.g. mobilization of a medical team in a multi-victim accident or confrontation of an "impaired " colleague.
12. Games - informal activities with goals, rules, rewards and penalties for various courses of action. Games may be computerized, played individually or in groups, facilitated or self-paced.
13. Role Modeling - portrayal of desired professional behaviors, communication skills, or clinical skills, etc. by attending/supervising physician with the expectation that residents will learn these behaviors and skills by observing the role models.

**Assessment Methods**

1. **Clinical Performance Ratings** - Monthly, rotation, semi-annual or annual ratings of resident performance
2. **Focused Observation and Evaluation** - Supervisor/attending observation of individual resident-patient encounters, operations, specimen preparation, etc., and concurrent (same day) evaluation
3. **360 Assessments** - Evaluation by MDs (supervisors, residents, medical students) and non-MDs (nurses, technicians, social workers, PAs ) using the same or similar evaluation forms
4. **Evaluation Committee** - Evaluation of resident performance in a small group discussion format, e.g., Evaluation Committee
5. **Structured Case Discussions** - An informal structured mini-oral exam consisting of a small set of pre-determined questions; the exam occurs during a resident's case presentation to his/her supervisor
6. **Stimulated Chart Recall** - Uses a resident's patient records in an oral exam-like format to explore decisions made and patient management; is conducted "after the fact" using patient charts to stimulate memory of the case
7. **Standardized Patient** - The resident provides care to an SP as if (s)he were a real patient and is evaluated concurrently by the SP or another trained observer; the SP is a well person or actual patient trained to present a case in a standardized way
8. **OSCE** - A multi-station exam of simulated clinical tasks, which might include SPs, anatomical models, X-ray interpretation, lab test interpretation, etc.; a resident performs the tasks and is evaluated concurrently by a trained observer
9. **High Tech Simulators/Simulations** - Residents' performance of procedures on a high-tech simulator (e.g., Harvey) is evaluated; this may involve built-in evaluation by the simulator or observation and concurrent evaluation.
10. **Anatomic or Animal Models** - Residents' performance of procedures on non-computerized, 3-dimensional models that replicate the properties of human anatomical structures is observed and evaluated concurrently
11. **Role-play or Simulations** - Residents are evaluated based on their performance on assigned responsibilities in a staged replica of a potentially real situation, e.g., mobilization of medical team in a multi-victim accident, confrontation of an "impaired" colleague, negotiation with administration regarding facilities and equipment upgrade
12. **Formal Oral Exam** - "Mock" oral exam in which an examiner asks residents questions about what to do in a clinical scenario presented verbally or role played by the examiner
13. **In-training Exams** - A multiple-choice exam developed by an external vendor
14. **In-house Written Exams** - A multiple choice exam developed by residency program faculty
15. **Multimedia Exam** - A computer based multiple choice or branching question exam in which authentic visual and auditory patient information is presented as question information
16. **Practice/Billing Audit** - Educational equivalent of physician profiling; this data-based process benchmarks individual resident billing data against peers in the office, hospital, or managed care setting
17. **Review of Case or Procedure Log** - Review of number of cases or procedures performed and comparison against minimum numbers required
18. **Review of Patient Chart/Record** - Involves abstraction of information from patient records, such as tests ordered, and comparison of findings against accepted patient care standards
19. **Review of Patient Outcomes** - Aggregation of outcomes of patients cared for by a resident and compared against a standard

20. **Review of Drug Prescribing** - Systematic review of drug prescribing for selected conditions to determine adherence to protocol
21. **Resident Project Report (Portfolio)** - Evaluation of resident work products, such as reports of research studies, practice improvement, or systems-based improvement
22. **Resident Experience Narrative (Portfolio)** - Evaluation of performance based on residents' narratives of critical incidences or other experiences, usually accompanied by reflection on the event, e.g., what happened, why, what could have been done differently
23. **Other Portfolio** - Evaluation of resident performance based on other work/performance products not included above, e.g., audiotapes, slide presentations