The Fundamentals of Phlebology Ultrasound eCourse was created to provide a comprehensive resource for those interested in learning about or refining the use of ultrasound in their phlebology practice. The faculty is comprised of leaders in the phlebology community, many of whom helped establish the field of phlebology in the US and internationally. The goal of this eCourse is to provide a strong, comprehensive foundation for those who are new to the field and to serve as a reference guide to those with established venous practices. In addition to didactic lectures, the series also offers ScanLabs with synchronized scanning and practical demonstrations of the techniques and principles taught.
Module 1: The Clinical Evaluation of the Phlebology Patient

Beginning with an overview of the spectrum of venous disease, Helane Fronek, MD discusses the patient history, physical examination, and language of the venous clinical exam. In addition to demonstrating various clinical manifestations and venous reflux patterns, the lecture also encompasses differentiation of lymphedema, lipedema, and idiopathic venous edema.

Core Concepts: 68 min
Focus Session: 51 min

Module 2: Practical Application of the History and Physical Exam

In Module 2 of the Assessment of the Phlebology Patient module set, Dr. Helane Fronek shares her approach to obtaining a thorough patient history, including techniques to reveal the signs, symptoms and impact of the patient’s venous disease. Dr. Fronek provides a demonstration of the clinical exam of the venous patient, describing best practices for determining venous reflux patterns and the underlying venous pathophysiology.

Core Concepts: 47 min
Focus Session: 36 min

Module 3: Venous Physiology and Pathophysiology

This module begins with a review of histology, anatomy, and the relationship between the deep and superficial venous systems. Dr. Dentoni discusses the function of the calf muscle pump and abdominothoracic pump, emphasizing the respiratory effect of venous return, the impact of superficial vein pressure gradients, and the progression of chronic venous hypertension. The module concludes with Dr. Dentoni examining the etiology and pathogenesis of primary and secondary varicose venous disease.

Core Concepts: 21 min
Focus Session: 16 min

Module 4: Venous Anatomy

Joseph Zygmunt, RVT, RPhS begins Module 4 with an historical overview of the detection and diagnosis of venous disease, leading to a discussion of key nomenclature revisions, anatomic terminology clarifications, general hemodynamic concepts, and structure of the leg compartments. Joe covers the structure and distribution of venous valves, function of the various muscle pumps including the hamstring muscle pump and Lejar’s Pump. In the Deep Venous section, Joe discusses the anatomy of infrainguinal and suprainguinal vessels, including pelvic leak points. In the Superficial Venous section, Joe elaborates on the distribution of reflux patterns and superficial venous anatomy, with an emphasis on the saphenous arch and the five major tributaries of the saphenofemoral junction, GSV types, and patterns. The final section of this module covers the perforating system, saphenous and sural nerves, the SPJ fascial curve, and incidental findings.

Core Concepts: 29 min
Focus Session: 22 min
Module 1: Creating a Vein Map
Joseph Zygmunt, RVT, RPhS begins Module 1 with a review of current AVF/SVS Guidelines for venous duplex scanning, pathologic reflux values, anatomy of the superficial and perforating venous systems, and reflux patterns. Joe teaches a thorough four-step mapping technique with various vein map examples. From his years of experience, he shares practical tips on optimizing the vein mapping process, enabling the sonographer to provide valuable information to aid in the patient’s treatment plan.

Core Concepts: 61min
Focus Session: 46 min

Module 2: Ultrasound Techniques Pre, Peri, and Post-Procedure
Diana Neuhardt, RVT, RPhS begins this module with a discussion of pre-procedure planning and tips, followed by Nick Morrison, MD presenting technical considerations during the procedure, including tip placement and the technique for ultrasound-guided tumescent anesthesia. Videos are used to reinforce the concepts discussed. The module concludes with a discussion of post-op follow-up procedure and potential complications. Technical tips on how to optimize ultrasound images and procedure outcomes are integrated throughout the module.

Core Concepts: 60 min
Focus Session: 45 min

Module 3: Scan Lab – Varicose Veins
In this ScanLab which utilizes synchronous scanning, Diana Neuhardt, RVT, RPhS teaches the process by which a sonographer assesses a patient with venous insufficiency. Throughout the module Diana provides a review of sonographic anatomy and demonstrates technical tips in optimizing the ultrasound image as well as providing proper documentation.

Core Concepts: 48 min
Focus Session: 36 min

Module 4: Scan Lab: Post-Thermal Ablation with Recurrence
In this ScanLab, Diana Neuhardt, RVT, RPhS demonstrates the process by which to assess a patient with recurring disease. Building on the information presented in Module 3: Scan Lab – Varicose Veins, Diana emphasizes the investigative process to document the source of the patient's symptomology. Sonographic anatomy is reviewed throughout the ultrasound examination.

Core Concepts: 14 min
Focus Session: 11 min

Module 5: Scan Lab: Pelvic Reflux
Module 5, presented by Diana Neuhardt, RVT, RPhS, and Barbara Pohle-Schulze, RVT, RDMS, RDCS, RPhS, demonstrates the process of assessing a patient with suspected pelvic reflux. Diana begins the module with a scan of the lower extremity veins followed by Barbara performing a scan of the pelvic veins. Synchronous scanning is used to facilitate teaching of the ultrasound procedures.

Core Concepts: 61 min
Focus Session: 46 min
Module 1: Basic Principles
Hugo Partsch, MD begins this four-module series on Compression Therapy by providing a comprehensive description of the basic principles of compression therapy followed by a discussion of the indications and contraindications of compression bandages. Dr. Partsch discusses the practical application of the Law of Laplace and Pascal's Law, the clinical application of the Static Stiffness Index (SSI), and the correlation with standing and working pressures. Dr. Partsch concludes this module with a discussion of compression therapy in the treatment of patients with venous stasis disease, chronic edema, lymphedema, and mixed ulcers.

Core Concepts: 44 min
Focus Session: 33 min

Module 2: Compression Therapy for Chronic Edema and Leg Ulcers
In this module, Dr. Joseph Caprini discusses the theory and practical application of compression therapy in chronic edema and leg ulcers. Beginning with an overview of capillary and valve function, he teaches the underlying physiologic changes that occur with venous stasis disease. Dr. Caprini covers the principles of long and short-stretch compression therapy, including the Static-Stiffness Index (SSI), and gives practical examples of clinical implementation. Dr. Caprini concludes with discussion of therapeutic compression stockings, Velcro devices and compression pumps.

Core Concepts: 81 min
Focus Session: 61 min

Module 3: Post-Procedure Compression Therapy
In Module 3: Post-Procedure, Giovanni Mosti, MD discusses how to achieve therapeutic compression levels in patients after active therapy of varicose veins. MRI correlations provide unique insight into the effectiveness of proper compression bandaging. Dr. Mosti addresses possible minor and major adverse events as well as relative and absolute contraindications to compression therapy.

Core Concepts: 23 min
Focus Session: 18 min

Module 4: Bandaging Techniques
The last module in the Compression Therapy Series is presented by Drs. Partsch and Mosti. In this module, proper bandaging techniques and the effectiveness of proper compression bandaging are described through demonstrations with the PicoPress pressure measurement system in static and dynamic conditions.

Core Concepts: 19 min
Focus Session: 15 min
Module 1: Hematological Management
In Hematological Management, Stephanie Dentoni, MD provides insight into anti-coagulation and treatment options of venous thromboembolism, treatment of superficial thrombophlebitis and CHEST anti-thrombotic therapy and prevention of thrombosis guidelines. Dr. Dentoni concludes this module by reviewing complications of treatment.

*Core Concepts: 34 min*
*Focus Session: 26 min*

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Module 1: Fundamentals of Lymphedema
Dr. Andrea Brennan, certified lymphedema specialist, begins the Lymphedema Series with a presentation on the diagnosis and evidence-informed treatment of lymphedema. Dr. Brennan describes the pathophysiology and stages of lymphedema, mechanism of compression bandaging, and options for compression in the lymphedematous limb. Dr. Brennan reviews lymphatomes and the proper sequencing of manual lymphatic drainage. Differential diagnosis of phlebolymphedema, lipedema, and lipo-lymphedema is discussed. The module concludes with case examples comparing pre and post-treatment results.

*Core Concepts: 67 min*
*Focus Session: 51 min*

Module 2: Bandaging the Lymphedematous Limb
In this module, Dr. Andrea Brennan, certified lymphedema specialist, demonstrates the proper bandaging technique for the lymphedematous limb. She begins with a discussion of essential supplies and provides lower extremity bandaging tips throughout the demonstration. Dr. Brennan also provides a demonstration of toe bandaging and discusses methods by which to increase patient compliance.

*Core Concepts: 32 min*
*Focus Session: 24 min*

Module 3: Manual Lymphatic Drainage
Module 3 provides a live demonstration of the manual lymphatic drainage (MLD) technique. Anatomical lymphatic regions are reviewed with a discussion of the importance of hand position, movement technique, and sequencing in determining the effectiveness of MLD.

*Core Concepts: 17 min*
*Focus Session: 13 min*
Module 1: Ambulatory Phlebectomy vs Sclerotherapy
In Module 1: Ambulatory Phlebectomy vs Sclerotherapy, Dr. Morrison leads the viewer through the advantages and disadvantages of AP vs Sclero procedures, including possible complications. This module includes a ScanLab of a chemical ablation procedure in which Dr. Morrison and Diana Neuhardt, RVT, RPhS demonstrate the techniques and advantages of ultrasound-guidance during chemical ablation. Technical tips are incorporated throughout the ScanLab.

Core Concepts: 34 min
Focus Session: 26 min

Module 2: Sciatic Vein Nerve Sheath Malformation
In Module 2: Sciatic Vein Nerve Sheath Malformation, Mel Rosenblatt, MD demonstrates the procedure to ablate a congenital sciatic venous malformation. Utilizing fluoroscopy and ultrasound, Dr. Rosenblatt narrates the technique used to successfully treat the sciatic venous malformation.

Core Concepts: 42 min
Focus Session: 32 min

Module 1: Visual Sclerotherapy
The first module in the Sclerotherapy series begins with a review of the diagnostic assessment and modern principles of venous treatment using sclerosants. Various presentations of venous disease are discussed with a focus on determining the source of the reflux and how to obtain the best possible patient outcome. Following a review of contraindications, treatment options for telangiectasia, reticular veins, and varicose veins are considered. The mechanism of action for common sclerosants is presented followed by a discussion of post-procedure treatment, charting, and documentation of results.

Core Concepts: 29 min
Focus session: 22 min

Module 2: Complications in Sclerotherapy
In the second Sclerotherapy module, Steven Zimmet, MD presents common complications including hyperpigmentation, matting, ulceration, and thrombosis. Less common, but nonetheless important, he discusses anaphylaxis and neurological complications. Through the emphasis of technical points to prevent complications and to manage treatment when they do occur, Dr. Zimmet shares his technical expertise, developed over many years in his phlebology practice.

Core Concepts: 35 min
Focus session: 27 min
Module 3: Sclerotherapy ScanLab

Steven Zimmet, MD begins the ScanLab module with a review of the patient history and the clinical exam, demonstrating his technique for marking veins in preparation for visual sclerotherapy treatment, including tray set-up. During treatment, Dr. Zimmet explains the differences in technique for treating spider veins vs. reticular veins. The second patient in this ScanLab is receiving sclerotherapy post-endovenous ablation. Telangiectasia, venule telangiectasia, spider, and reticular veins are treated with Dr. Zimmet establishing the importance of matching the sclerosant to the vein being treated. Common errors and potential complications of over treating are discussed with an emphasis on using a low volume of sclerosants in the appropriate concentration. In conclusion, Dr. Zimmet discusses techniques to increase patient comfort during and after the procedure.

Core Concepts: 40 min
Focus session: 30 min

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Institute for Medical Studies and Pegasus Lectures, Inc. The Institute for Medical Studies is accredited by the ACCME to provide continuing medical education for physicians.

The Institute of Medical Studies designates this activity for a maximum of 24.25 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.
eCourse Features

- Flexible viewing
- Dual Video Streaming
- Scan Labs

- Interactive Questions
- Bookmarking Capability
- Modular Delivery

- Customized Review
- Integrated Note-Taking
- Printable PowerPoints

For More Information

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