**Syllabus Template for Ultrasound Enhancing Agent (UEA) Administration**

**Course Number and Name:**

**Credits:**

**Hours:**

**Instructor:**

**Course Description:** This workshop has been designed to help sonographers and sonography students gain didactic and "hands-on" experience with the theory and skills needed to administer ultrasound enhancement agents (UEA). Content includes a review of microbubble physics and ultrasound instrumentation, recognition of indications for the use of UEAs, and development of written policies for contrast agent infusion or injection. Information on legal aspects, malpractice insurance, and proper documentation will be included. Supplies will be provided for practicing administration of UEAs and individual competency validation will be provided by the instructor at the end of the program. However, a supplemental period of structured on-the-job training and competency evaluation for each individual is required in order to successfully apply this knowledge in a clinical setting.

**Learning Objectives:**

* Discuss basic information regarding contrast-enhanced ultrasound
* Identify legal and policy considerations in regard to UEA administration
* Define the proper technique and procedure for UEA administration
* Demonstrate the ability to properly administer various UEAs
* Recognize complications that can occur with UEA administration
* Demonstrate appropriate documentation of UEA administration

**Instructional methods:** Lectures, labs, simulated UEA administration

**Suggested Reference Materials:**

[American Society of Echocardiography Contrast Zone](http://www.contrastzone.com/)

* The Basics
* Guideline Documents
  + Mulvagh, et al. American Society of Echocardiography Consensus Statement on the Clinical Applications of Ultrasonic Contrast Agents in Echocardiography. J Am Soc Echocardiogr 2008;21:1179-1201.
  + Porter, et al. Guidelines for the Cardiac Sonographer in the Performance of Contrast Echocardiography: A Focused Update from the American Society of Echocardiography. J Am Soc Echocardiogr 2014;27:797-810.
  + Porter et al. Clinical Applications of Ultrasonic Enhancing Agents in Echocardiography: 2018 American Society of Echocardiography Guidelines Update. J Am Soc Echocardiogr 2018;31:241-274.
* Videos
  + How to Administer Contrast
  + Ultrasound Enhancing Agent Safety
  + How to Perform a Myocardial Perfusion Study
* Webinars
  + Guidelines for the Cardiac Sonographer in the Performance of Contrast Echocardiography
  + Clinical Applications of Ultrasonic Enhancing Agents in Echocardiography: 2018 ASE Update
* ICUS Sonography Programs
  + IAC & ICUS Present: Introduction to Contrast Enhanced Ultrasound for Echocardiography
  + IAC & ICUS Present: Safety and Efficacy of Ultrasound Enhancing Agents
* Poster and DVDs
* Coding for Contrast
* Helpful Information from Industry – includes videos, case studies, and agent-specific information
* Frequently Asked Questions

**Course Syllabus (Suggested Learning Modules)**

Contrast Imaging Basics

* How it works
* FDA-approved UEAs
* Clinical applications
* Advantages
* Disadvantages
* Adverse reactions

Legal/policy considerations

* Individual facility/state policies - requires hospital approval
* Individual facility practice
  + Procedures/protocols/standing orders
  + Indications
  + Contraindications
  + Patient education/consent

Administration according to facility procedures

* PIV insertion/removal by sonographer
* Utilization of existing PIV sites
* Avoiding usage of PICC or central lines
* Coordination with RN for medication infusions

General Documentation Guidelines

* Patient education/consent
* PIV insertion/removal if applicable
* UEA dose or saline volume and date/time of administration

Practice Lab

* Preparation and administration of available UEAs
  + Based on ASE/industry guidelines and/or individual facility protocols
  + Protocol examples are available in the appendix of Porter, et al. Guidelines for the Cardiac Sonographer in the Performance of Contrast Echocardiography: A Focused Update from the American Society of Echocardiography. J Am Soc Echocardiogr 2014;27:797-810.
* Preparation and administration of agitated saline
  + Based on ASE guidelines and/or individual facility protocols
* Documentation of lab-based competency testing

Plan for transition to clinical practice and competency testing according to facility policy

Plan for ongoing competency (if applicable)