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# Infection Control During Sclerotherapy

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## Abstract

With the recent increase in viral blood borne pathogens such as HIV and Hepatitis, appropriate precautions need to be taken to prevent infection to the patient or health care worker during sclerotherapy. To appropriately apply precautions, all patients should be presumed to be potentially infected with blood borne pathogens and the practitioner must practice appropriate disinfection and sterilization techniques dependent on the equipment used. A recent publication has linked the spread of Hepatitis C in a number of patients through sclerotherapy. Since sclerotherapy is practiced by an ever-increasing diversity of practitioners, with varying levels of instruction regarding infection control in a procedural environment, it is evident that an increased awareness of current guidelines is needed. We believe awareness would help avoid transmission of presently incurable infections. In this paper, we summarize some of the areas of risk for infection during Sclerotherapy. Based on the latest guidelines from Centers for Disease Control (CDC) we recommend some simple techniques to help reduce the risk of infection during this procedure.

## Introduction

Blood borne pathogens such as HIV, Hepatitis B and C, have become a major area of focus in the healthcare community where there is potential for contact with bodily fluids. Hepatitis C, in particular, can remain infectious on surfaces and requires only a small inoculation to infect. To reduce the hazard of accidental exposure of these pathogens to the clinician, and to minimize the possibility of inter-patient infection, the CDC has recently updated their guidelines for disinfection and sterilization in healthcare facilities (1). These guidelines are evidence based methods to help prevent infection from blood borne pathogens and represent the standard of care in the United States. We have used these upgraded guidelines to evaluate the current methods applied in sclerotherapy for infection control.

*Very little is known of the incidence of infections arising from sclerotherapy since there are no strict guidelines on this procedure or for reporting infections arising from this procedure.*

Sclerotherapy is a procedure that involves multiple injections of a sclerosant into diseased veins to destroy them (Figure 1, page 54). During this procedure a small amount of blood oozes out of each injection site. The clinician performing this procedure is in close association with the patient's blood and there is risk for accidental exposure from the patient to the clinician. In addition, surfaces in the treatment area can become contaminated with blood products. Gloves worn by the practitioner come in contact with the patient's blood and can become a vector for transmitting bodily fluids to nearby non-disposable equipment used in the procedure. If the surrounding equipment and surfaces are improperly handled, they

can become a vector to transmit an infection to another patient. The patient becomes at risk for exposure from errors in procedural technique or improper disinfection/sterilization.

Very little is known of the incidence of infections arising from sclerotherapy since there are no strict guidelines on this procedure or for reporting infections arising from this procedure. Moreover, a majority of sclerotherapy procedures are performed in the physician's office, where there is no oversight group to monitor infections or require continuing education in infection control as is done in hospitals.

A recent publication by de Ledinghen et al traced the source of Hepatitis C infection in 62 patients to the treatment of these patients by sclerotherapy (2). They used an elaborate method of identifying the gene involved in HCV transmission to identify the source of the infection. After an extensive review of the sclerotherapy practices, the use of single-use sclerosant vials for multiple patients was deemed to be the vector for patient-to-patient transmission of the HCV. This publication, combined with the recently upgraded guidelines from the CDC, speak to the need to raise awareness in our phlebologic community regarding infection control and the current evidence based system for deciding on appropriate methods for disinfection and sterilization.

## What Are the Areas of Risks for Infection?

There are three areas where the risks of infection need to be addressed during sclerotherapy. They are:

1. The risk to the clinician from accidental exposure to blood borne pathogens
2. The risk to the patient during the procedure from multiple accesses
3. The risk to the patient from patient-to-patient contamination and infection

### 1. Risks to the Clinician

The greatest risk to the clinician during Sclerotherapy is through an accidental needle stick injury or splash injury to the eye or mucous membranes. Inadvertent eye splash injury can occur especially during very superficial telangiectatic injections or when producing foam sclerosant by agitation between syringes. The Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) have an extensive list of techniques that a physician or a nurse should follow to help prevent accidental needle stick injuries. Manipulation of the needle in the patient and failure to properly dispose of sharps after use are the two highest risk activities and deserve constant vigilance. Use of hepatitis B vaccination, engineered needles and wearing of personal protective equipment (gloves, face or eye protection, gowns) are recommended. If an injury occurs, a list of how to report the accident and the procedures to follow following the accident are described at the OSHA and NIOSH web sites (3,4). We believe it is important to have these policies readily available in an easily accessible location.

From personal experience we can recommend use of luer lock syringes rather than taper tip during foam agitation. Taper tip syringes can become accidentally dislodged by pressure during foam agitation and spray nearby personnel.

## 2. Risks to the Patient During the Procedure (Multiple Percutaneous Access)

Since sclerotherapy involves multiple venous injections in a small area, the use of the same needle increases the risk of bacterial contamination. Controlling the area around the patient and skin disinfection area will reduce the risk of infection. We suggest skin disinfection with 70% isopropyl alcohol in the region to be injected, with repeated application to treatment areas or if the patient is repositioned.

## 3. Risk to the Patient from Inter-Patient Contamination

The risk to the patient from inter-patient contamination has been greatly reduced by the use of single patient 2cc vials of sclerosant as well as disposable sterile syringes and supplies. Proper disposal of these pieces of equipment will eliminate them from becoming potential sources of cross-contamination.

The area we currently fear has the greatest potential for inter-

*Unless appropriately cared for, there is risk of transfer of blood borne pathogens from the equipment to a subsequent patient.*

patient contamination is the non-disposable accessory equipment we see used for sclerotherapy. Examples are the Veinlite (5), the ultrasound probe, any optical assistance device that requires repositioning during the procedure (i.e., VeinViewer (6), headlamp, goose-neck lamp, etc) and even the treatment bed. These devices can get contaminated by direct contact with blood products or by being touched with contaminated gloves during the procedure. Unless appropriately cared for, there is risk of transfer of blood borne pathogens from the equipment to a subsequent patient.



Regarding devices such as the Veinlite and ultrasound probes, the CDC has a three level classification system whereby devices are classified as critical, semi-critical and non-critical depending on their contact with blood and mucous membranes. Instruments that come in contact with sterile tissue are classified as “critical” and require sterilization by steam, heat or chemical means. Instruments that come in direct contact with mucous membranes or non-intact skin such as the Veinlite and ultrasound probe, when used for sclerotherapy, are classified as “semi-critical” and require immediate post procedural mechanical cleaning and sterilization, or at least high-level disinfection. Instruments that contact intact skin are classified as “non-critical”. The use of probe covers for

ultrasound probes and disposable covers for Veinlite reduces the contamination of the equipment. The CDC supports the use of probe covers but presumes that even if a cover is used it can fail, and there is significant data to support this. Recognizing this fact the CDC disinfection recommendation remains the same as if the cover was never used.

The technique of sterilization or disinfection is based on the resilience of the equipment. Some choices include steam sterilization, Ethylene Oxide “gas” sterilization, Peracetic Acid Sterilization, and others (1). A popular method of high-level disinfection is to immerse in 2% Gluteraldehyde solution for 20 minutes at room temperature. Correct contact time is important to achieve appropriate disinfection and the disinfectant manufacturer’s instructions should be followed. Since there is variability in the metals, plastics and adhesives used in the manufacture of these devices, it is important to refer to the manufacturers approved list of methods or chemical agents for their particular equipment.

For other equipment that does not come into direct contact with the patient, but can potentially be contaminated by touch with gloves soiled by blood products, the CDC defines these items as “clinical contact items” and recommends barrier protective coverings (e.g., clear plastic wraps) for the portions of the equipment that will be handled. The covers should be changed between patients. Protected surfaces should be disinfected at the end of the day or if contamination is evident. If not barrier protected these surfaces should be disinfected between patients with an intermediate disinfectant. An intermediate level disinfectant is defined as an agent that destroys all vegetative bacteria, including tubercle bacilli, lipid and some non-lipid viruses, and fungi, but not bacterial spores. The intermediate disinfectant we currently use for surfaces are the PDI Super Sani Cloths, which utilize alcohol and a quaternary ammonium compound for disinfection and require only a two minute contact time.

Another possible vector is the bed the patient lies on during the procedure. Our practice is to cover the bed with a new disposable impervious drape prior to the procedure to avoid contamination of the bed. When the procedure is complete we dispose of the impervious sheet and disinfect the bed as a “clinical contact surface” by using disinfecting wipes such as PDI Super Sani Cloths or Optim 33 TB wipes. Both of these products would be considered intermediate level surface disinfectants having tuberculocidal and virucidal claims.

## Discussion and Recommendations

The risk of infection during sclerotherapy is low. However, the consequences of accidental infection from HIV or HCV blood borne pathogens are severe. Professional practice policies and procedures for sclerotherapy, consistent with the latest CDC guidelines, as well as the OSHA and NIOSH recommendations, will help minimize risk of infection to patient and healthcare workers. Since clinical signs of HIV and HCV are not always present, all patients should be seen as potentially infected with a blood borne pathogen and appropriate precautions taken. When possible, disposable covers should be used on equipment that comes in contact with the patient’s non-intact skin to prevent gross contamination. Since disposable covers are known to fail with significant frequency, the disinfectant category for the probes does not change even with their use. Reducing the risk of contamination and infection should be of paramount concern for the clinician since some pathogens such as HIV and Hepatitis C are not curable. A thorough understanding of the latest CDC guidelines for disinfection and sterilization as well as OSHA and NIOSH standards is recommended. Additional recommendations for equipment and surfaces used in sclerotherapy following 2008 CDC guidelines are as follows:

- **Ultrasound and Veinlite probes:** When probe covers are available, use a probe cover or condom to reduce the level of microbial contamination. Even if probe covers have been used, clean and high-level disinfect or sterilize the probe immediately after the procedure. Equipment differs in materials construction so always use a process that has been tested and approved by the equipment manufacturer.
- **For accessory equipment and surfaces that may become contaminated by blood products during the procedure:** The CDC defines these surfaces as clinical contact surfaces. Barrier protective coverings (e.g., clear plastic wraps) can be used for these surfaces, particularly those that are difficult to clean. The coverings should be changed when visibly soiled or damaged and routinely (e.g., between patients). Protected surfaces should be disinfected at the end of each day or if contamination is evident. If not barrier-protected, these surfaces should be disinfected between patients with an intermediate-disinfectant (i.e., EPA-registered hospital disinfectant with tuberculocidal claim) or low-level disinfectant (i.e., EPA-registered hospital disinfectant with an HBV and HIV label claim).
- **Although we protect the treatment bed surface with an impervious cover we recognize the cover can move and the bed can become inadvertently and unnoticeably contaminated. We therefore perform an intermediate level disinfection to the bed surface between all patients. ▼**

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**About the Authors and Disclosures**

Dr. Nerney is a Fellow of the American College of Surgeons and has been in practice as a general and vascular surgeon since completing his residency at the University of Florida in 1986. He has an intense interest in phlebology and encompasses sclerotherapy as well as surgical and endovenous treatments in his practice. Dr. Nerney received no financial compensation for this article.

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Mr. Mullani is a retired associate professor of University of Texas Medical School, Houston, Texas. He is one of the inventors of Positron Emission Tomography (PET), the inventor of DermLite device used for skin cancer screening and the inventor of the Veinlite device. He currently has royalty arrangements with Positron Corporation and is owner of TransLite LLC and partner in 3GEN LLC.

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