Introduction

Ophthalmic healthcare providers are responsible for properly maintaining ophthalmic instruments. The care and handling of microsurgical instruments are basic and important functions. The ophthalmic specialist is responsible for instruments made from a variety of materials and must use different techniques in handling and caring for each type. While current technology supplies us with stronger and more reliable materials, the term “microsurgical” connotes delicacy and fragility. The healthcare provider is the patient’s advocate; therefore all measures are taken to prevent infections and inflammations, and promote optimal patient care.

Properly maintaining microsurgical instruments will increase instrument life and reduce costs by minimizing the need for repair and replacement. In addition, the instruments will function properly and safely. Instruments that function properly and are appropriately prepared are essential to safe patient care. Instrument care is a routine part of the responsibility of the ophthalmic health care provider. Attention to the details of care and handling of ophthalmic microsurgical instruments will affect your patient outcomes. The same standard of care must be given to all patients.

Educational Objectives

After reading this publication, the healthcare provider will be able to:

- Describe the care and handling process of ophthalmic microsurgical instruments.
- State the differences among steam, gas, and cold sterilization procedures.
- Describe how ophthalmic instruments are decontaminated for safe handling.
- Explain the role of ultrasonic cleaning.
- Discuss why lubrication is important to the care of ophthalmic instruments.
- Describe proper storage procedures for ophthalmic instruments.
- Identify instrument cleaning methods that can prevent Toxic Anterior Segment Syndrome (TASS) and Endophthalmitis.
Instrument Materials

Metal Composition
The metal alloys used in surgical instruments must be resistant to corrosion, which can result from exposure to blood, body fluids, cleaning solutions, sterilization and the atmosphere. Most instruments are made with stainless steel, titanium, a cobalt-based alloy (Vitallium) or other metals. It is important to know the metal composition of surgical instruments. Instruments containing dissimilar metals must be separated during cleaning to prevent electrolytic deposition of metals.

Stainless Steel
The most common material used in producing microsurgical instruments is stainless steel. Stainless steel is an effective metal for surgical instruments because of its tensile strength and resistance to corrosion. An alloy of iron, chromium, and carbon, stainless steel also contains nickel, manganese, silicon, molybdenum, sulfur, and other elements.

Stainless steel is an alloy extremely resistant to stains and corrosion. The term “stainless steel” is a slight misnomer. Stainless steel resists stains. Without proper care, stainless steel instruments can spot, pit, and corrode. Austenitic and Martensitic are two types of stainless steel.

Austenitic (Series 300) stainless steel is nonmagnetic and is not heat-treated. It has a very low carbon content that makes it the most stain-resistant of all steels. However, the low carbon content also precludes heat-treating this type of steel for hardening. Austenitic stainless steel is very common for instruments such as lid speculums, hooks, retractors, and calipers.

Martensitic (Series 400) stainless steel is magnetic and heat-treated. It contains a small amount of carbon that enables hardening. Some Martensitic metals have slightly higher carbon content than others. These differences in the amount of carbon allow differences in hardness for certain instruments. Steels with a lower percentage of carbon are used for making forceps, hemostats, and needle holders. Steels with a higher percentage of carbon are suitable for scissors, curettes and trephines. Martensitic steel is less stain-resistant than Austenitic steel due to its higher carbon content.

Titanium
Titanium has excellent metallurgical properties for use in microsurgical instruments. The most notable and useful properties of