



Society of Gastroenterology Nurses and Associates, Inc.

## Gas Sterilization of Endoscopes FAQs

The purpose of this FAQ is to provide general information specific to gas sterilization of gastrointestinal endoscopes. Users are encouraged to refer to the *CDC Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008* for additional information on this topic.

### 1. Why consider gas sterilization of endoscopes?

After a cluster of carbapenem-resistant Enterobacteriaceae [CRE] outbreaks occurred at a single northeastern Illinois hospital between March and July 2013, the Centers for Disease Control [CDC] launched an investigation to determine the source of the infection. They traced it back to a duodenoscope used for ERCP.

As a result of the investigation, the facility chose to move from high level disinfection to gas sterilization using ethylene oxide [EtO] when the endoscope was used on a patient with a known CRE infection (Frias et al., 2014). Additional CRE outbreaks followed in 2015 and were traced to duodenoscopes that were not adequately reprocessed.

### 2. Is it possible to use the autoclave to steam sterilize an endoscope?

It is NOT possible to use the autoclave to achieve sterilization because endoscopes contain heat-sensitive components which could be damaged by the high temperatures used in an autoclave. Endoscope manufacturers do not endorse steam sterilization for their products.

### 3. What are the advantages of EtO gas sterilization?

Since it does not rely on heat, EtO gas sterilization is an effective method for rendering heat-sensitive instruments, such as endoscopes, sterile.

### 4. How does it work?

After manual cleaning, the endoscope is placed in a sealed chamber where temperature, relative humidity, and air flow are controlled. A vacuum is created within the chamber which draws the incoming EtO gas into every portion of the endoscope so that no micro-organisms can survive. This technique effectively sterilizes instruments with channels, empty spaces, and intricate mechanical parts that make cleaning and high level disinfection difficult.

When the process is completed, air flow is controlled to repeatedly flush the chamber with air to remove all of the EtO gas. The entire process takes 14 hours or more (CDC, 2008).

### 5. What are its disadvantages?

Ethylene Oxide is toxic and carcinogenic to the personnel using the system. Vapor levels and individual exposure must be carefully monitored and spills must be handled appropriately to protect the health of anyone in the vicinity. Because the process takes at least 14 hours to complete, most facilities would need to increase their endoscope inventory to compensate for the extensive reprocessing time.

EtO gas sterilization is more expensive than chemical disinfection, may not be readily available, and has been deemed ineffective as a long-term solution.

**References**

Centers for Disease Control and Prevention [CDC], (2008). Retrieved from the *Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008* at [http://www.cdc.gov/hicpac/Disinfection\\_Sterilization/3\\_0disinfectEquipment.html](http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_0disinfectEquipment.html)

Frias, M., Tsai, V., Moulton-Meissner, H., Avillan, J., Epstein, L., Hunter, J., & Arwady, A. (2014). Notes from the Field: New Delhi Metallo- $\beta$ -Lactamase-producing *Escherichia coli* associated with endoscopic retrograde cholangiopancreatography. *Morbidity and Mortality Weekly Report [MMWR]*, 62(51), 1051.

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