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Re: Docket No. FDA-2011-N-0294; (Also, re: “*Draft Guidance: Processing/Reprocessing Medical Devices in Health Care Settings: Validation Methods and Labeling.*”)

Dear FDA,

Background: With the goal to improve both patient safety and the quality of the reprocessing of contaminated reusable medical equipment, the FDA invited the public in the Federal Register (July 28, 2011;76[145]:45268-9; Docket No. FDA-2011-N-0294) to comment on a number of instrument-reprocessing issues, including “factors affecting the reprocessing of reusable medical devices.” These factors include and focus on reusable device designs; reprocessing and validation methodologies; and best practices.

In response to this invitation by the FDA, I provide a number of comments herein. (Note: Some of my comments are also applicable to content provided in the FDA’s draft document entitled: “*Draft Guidance: Processing/Reprocessing Medical Devices in Health Care Settings: Validation Methods and Labeling,*” which I refer to herein as the “draft guidance document.”)

Comments:

Topic #1 – ENT endoscopes: In January of 2005 I wrote a letter to the FDA recommending that the Agency review for clarity and consistency its document entitled “*Guidance for Manufacturers Seeking Marketing Clearance of Ear, Nose, and Throat Endoscope Sheaths Used as Protective Barriers (Guidance for Industry)*” (issue date: March 12, 2000). Under its heading "H. Sterility Information," this guidance document states that:

- "Endoscopes, as used in ENT practice, are considered to be semi-critical devices as they come in contact with mucous membranes, which may or may not be intact. The Center for Disease Control (CDC) and Association of Practitioners in Infection Control (APIC) recommend high-level disinfection as the minimum acceptable level of reprocessing for semi-critical medical devices such as endoscopes ...”;
- "Reprocessing of the endoscope after removal of the used sheath and before application of a new sheath must be recommended and described in the user's

information manual. If the applicant sufficiently demonstrates protective barrier properties of the finished device, a cleaning procedure followed by an intermediate disinfection step will be required”;

- "The applicant should direct the user to follow the cleaning procedure recommended by the endoscope manufacturer. This should include instructions to clean the entire endoscope, including the eyepiece and any hand attachments. This process serves two purposes: to clean the endoscope in case of a break in aseptic technique by the user and to mechanically remove any material that may have contacted the insertion tube of the endoscope during application or removal of the sheath”; and,
- “In addition to cleaning, an intermediate disinfection step such as wiping with a 70% isopropyl alcohol soaked gauze pad should be recommended. This step is added to reduce the likelihood that any viable organisms remain on the endoscope prior to application of a new sheath. If the applicant wishes to propose a different cleaning regimen a full description and justification will be expected."

As I wrote to the FDA in my letter in 2005, some of these statements (note that, to date, this guidance document vis-à-vis ENT endoscope sheaths has not been revised) are not consistent with the FDA’s current recommendations; with comments the FDA presented at its 2-day public workshop in Maryland on the reprocessing of reusable medical devices (June 8-9, 2011); and with the FDA’s aforementioned draft guidance document (on the processing/reprocessing of medical devices).

As the FDA acknowledges, the ENT endoscope, like other flexible endoscopes, is a *semi-critical* device for which the CDC and APIC recommend high-level disinfection (at a minimum). Further, on page 10 of its draft guidance document, the FDA states (in the context of the cleaning of reusable devices and the use of protective covers) that “the cleaning and disinfection instructions for your device should assume that the device is used uncovered, because of the potential for loss of cover integrity during use.”

Well said, but this statement is not consistent with the FDA’s guidance document vis-à-vis ENT endoscope sheaths, which recommends the *intermediate-level disinfection* of ENT (semi-critical) endoscopes after removal of the used sheath or protective cover (i.e., “wiping with a 70% isopropyl alcohol soaked gauze pad”). Therefore, the FDA is respectfully requested, first, to consider revising its “*Guidance for Manufacturers Seeking Marketing Clearance of Ear, Nose, and Throat Endoscope Sheaths Used as Protective Barriers*” (and all other relevant documents) so as to be consistent with the draft guidance document (discussing the reprocessing of medical devices); and, second, to clarify that ENT endoscopes are not *non-critical* devices and, whether or not covered with a protective sheath during the procedure, would require high-level disinfection (at a minimum) – not intermediate-level disinfection as the FDA’s guidance document vis-à-vis ENT endoscope sheaths currently recommends.^{1,2}

As the FDA can appreciate, the mitigation, if not elimination, of confusing and inconsistent reprocessing instructions and device classifications is important to prevent confusion, improve the quality of instrument reprocessing, and minimize the likelihood of both instrument reprocessing lapses and disease transmission. Please refer to my articles on this topic; see *references #1* and *#2*, below.^{1,2}

Topic #2: Laryngoscope handles: Please clarify whether rigid laryngoscope handles (which attach to the laryngoscope's blade) are *semi-devices* that, whether or not covered with a protective cover, require high-level disinfection (at a minimum); or, alternatively, whether the FDA considers the laryngoscope handle to be a *non-critical* device for which intermediate- or low-level disinfection would be suitable. Please refer to *reference #3*, below.³

While the FDA's classification of laryngoscope handles, like AORN's and others, as *semi-critical* or *non-critical* devices is unclear, confusing, and (at times) inconsistent, my publications and review of the literature conclude that the laryngoscope's handle (like its blade) is *semi-critical*, thereby requiring high-level disinfection at a minimum. Refer to *reference #3*, below, and to the California Department of Health Services' "Recommendations for Reprocessing Rigid Laryngoscopes" (April 30, 2007; AFL 07-09), which is available at:

<http://www.cdph.ca.gov/pubsforms/Guidelines/Documents/InadequateReprocessingofRigidLaryngoscopes.pdf>

In conclusion, the FDA is respectfully asked to consider classifying laryngoscope handles as *semi-critical* devices, based on the device classification (i.e. Spaulding's) adopted by the FDA.

Topic #3: Skin electrodes: The FDA's draft guidance document lists skin electrodes as *non-critical* devices. Because during routine use these reusable devices can contact non-intact or abraded skin (e.g., scalp electrodes used during EEG), the FDA is respectfully asked to consider classifying these devices as *semi-critical* devices, based on the device classification (i.e. Spaulding's) adopted by the FDA.

Topic #4: Liquid chemical sterilization: As the FDA acknowledged in the Federal Register, "the adequate reprocessing of reusable medical devices is a critically important factor in protecting patient safety." Indeed, manufacturer instructions for reprocessing a reusable instrument that are unclear, incomplete, or impractical can adversely affect patient safety and the reusable device's safe and effective reprocessing, resulting in an increased risk of disease transmission and healthcare-associated infections (HAIs). Clear, succinct, and validated reprocessing instructions are important to the FDA's current efforts to improve public health and the quality of instrument reprocessing.

Therefore, the FDA is respectfully asked to clarify its definition of *liquid chemical sterilization*. Several FDA documents provide arguably confusing definitions and interpretations of this process, its effectiveness, and whether it is appropriate for use to reprocess *critical* devices used during invasive procedures. Whether such confusion may

pose an increased risk of HAIs and a reduction in the quality instrument reprocessing is unclear.

Adding to this confusion, the FDA's draft guidance document (on the processing/reprocessing of medical devices) appears to equate the term "liquid chemical sterilization" with high-level disinfection, as if the two were indistinguishable. For example, under this draft guidance document's heading "criterion 6," subheading "drying," the FDA uses these two terms together in the same context, writing that: "active device drying is another post-processing procedure which may reduce or eliminate recontamination of unwrapped devices after high level disinfection/liquid chemical sterilization reprocessing of devices because they will be wet at the end of reprocessing."

As if processes labeled to achieve "liquid chemical sterilization" might be more like (or the same as) high-level disinfection than true sterilization (I define herein "true" sterilization as a process that is associated with a sterility assurance level (SAL), can be monitored in the healthcare setting using resistant biological indicators (BIs), is not rinsed with potentially unsterile water, and renders the processed instrument wrapped, dry, and, of course, sterile), the FDA this past year published that: (a) BIs "are not appropriate (or required) for monitoring liquid chemical sterilization process";⁴ (b) the terminal water rinse produced by these processes "is not sterile";⁵ and (c) not being monitored using a validated BI, liquid chemical sterilization is without a published SAL.⁴⁻¹⁴

Also according to the FDA, first, "the final processed devices (associated with a liquid chemical sterilization process) are not sterile" and, second, liquid chemical sterilization "should *not* be used on instruments that must be sterile,"⁵ such as critical devices.

All of this said, under the heading "criterion 4," however, the FDA's draft guidance document nevertheless includes a discussion of liquid chemical sterilization in its description of steam, ethylene oxide gas, gas/plasma, dry heat, and chemical vapor sterilizers – as if the effectiveness of liquid chemical sterilization process is distinct from high-level disinfection and is like these other sterilization process; can be monitored using a validated BI (its conclusions to the contrary notwithstanding); and is associated with a SAL of, for example, 10^{-6} .

Which raises an interesting question: How a process cleared by the FDA and labeled to achieve *liquid chemical sterilization* can render processed instruments that, according to the FDA, are not sterile?

This question begets the conclusion that reusable devices processed by liquid chemical sterilization might instead be disinfected. Whether the FDA recommends drying the wet, reusable instruments after completion of a liquid chemical sterilization cycle, not only before storage, but also between patient procedures is unclear, although necessary to address and resolve (see p. 19 of the "draft guidance document). The FDA is respectfully asked to address these questions and to clarify the confusion I express herein about liquid chemical sterilization.

Topic #5: Definition of “sterile”: The FDA defines “sterile” (e.g., see p. 32 of the FDA’s draft guidance document) as a “state of being free from viable microorganisms.” This definition would seem incomplete, however, because it permits a “sterile” critical surgical instrument to be heavily contaminated and soiled with *non-infection* debris – for example, endotoxins or other non-infectious materials including soils, contaminants, and organic and non-organic compounds.

Note: Whereas others have published that steam-sterilized surgical instruments coated with hydraulic fluid (used inadvertently as a detergent to clean these instruments prior to terminal sterilization) are “sterile,” I disagree, having concluded that such coated instruments, even if the hydraulic fluid is non-infectious, cannot be sterile, as “sterility” connotes, in addition to the surgical instrument’s inability to transmit *infectious* organisms and viruses (and prions), its *cleanliness* and safety. Moreover, though not consistent with the FDA’s draft guidance document, the true definition of sterility most certainly also implies that the surgical instrument is unable to transmit *non-infectious* materials, too. Because surgical instruments coated with hydraulic fluid – like cases that have associated ophthalmic instruments contaminated after sterilization with sterile copper and zinc deposits with *TASS* (or, toxic anterior segment syndrome)¹⁵ – are unclean and capable of transmitting *non-infectious* materials that might cause a pyrogenic reaction, tissue inflammation, or another type of non-infectious syndrome or patient disorder, they cannot reasonably be deemed sterile, the FDA’s (and AMMI’s) definition of instrument “sterility” notwithstanding.

The FDA is respectfully requested to clarify whether its definition of “sterile” might be revised and re-defined as a “state of being free of viable microorganisms *and* of non-infectious materials.”

Topic #6: Data validation: The FDA is respectfully requested to clarify whether a reusable device manufacturer that lists in its labeling and reprocessing instructions as compatible and suitable another manufacturer’s automated reprocessing device (e.g., a washer-disinfector for flexible endoscopes) is required per the FDA’s Quality System Regulation to have validated itself the claims of this other manufacturer’s reprocessing device, or whether the reusable device’s labeling can simply refer to the other manufacturer as having the necessary validation data on file without having to validate itself the claims of this other manufacturer’s reprocessing device.

Respectfully,

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