Regulatory Status of Disinfectants Used to Process Dialysate Delivery Systems and Water Purification Systems for Hemodialysis; Guidance for Industry and FDA

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Office of Device Evaluation

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Preface

Public Comment

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Regulatory Status of Disinfectants Used to Process Dialysate Delivery Systems and Water Purification Systems for Hemodialysis; Guidance for Industry and FDA

This document is intended to provide guidance. It represents the Agency's current thinking on this topic. It does not create or confer any rights for or on any person and does not operate to bind the Food and Drug Administration (FDA) or the public. An alternative approach may be used if such approach satisfies the requirements of the applicable statute and regulations.

Purpose

FDA believes it is necessary to regulate disinfectants used to disinfect dialysate delivery systems and water purification systems used in hemodialysis as accessories to the devices that they are intended to disinfect to ensure the appropriate level of regulation necessary to protect public health. This guidance explains the risks that patients are exposed to and clarifies the regulatory status of disinfectants as accessories to dialysate delivery systems and water purification systems used in hemodialysis.

Introduction

Dialysate delivery systems are components of hemodialysis systems and high permeability hemodialysis systems, which are class II devices[1] (21 CFR 876.5820 and 876.5860, respectively). Water purification systems for hemodialysis are also class II devices (21 CFR 876.5665). FDA considers an accessory, which is not classified elsewhere, to be in the same classification as the device. Therefore, we consider the disinfectants used to disinfect dialysate delivery systems and water purification systems used in hemodialysis to be class II devices. These disinfectants, the component devices they are intended to disinfect, and their classifications and product codes are shown in Table 1.

1 The Federal Food, Drug, and Cosmetic Act (the act) (21 U.S.C. 301 *et seq*.), as amended by the Medical Devices Amendments of 1976 (the amendments) (Public Law 94-295), the Safe Medical Devices Act of 1990 (the SMDA) (Public Law 101-629), and the Food and Drug Administration Modernization Act of 1997 (the FDAMA) (Public Law 105-115), established a comprehensive system for the regulation of medical devices intended for human use. Section 513 of the act (21 U.S.C. 360c) established three categories (classes) of devices, depending on the regulatory controls needed to provide reasonable assurance of their safety and effectiveness. The three categories of devices are class I (general controls), class II (special controls), and class III (premarket approval).

Table 1 Disinfectants, dialysate delivery systems, and water purification systems used in hemodialysis

Disinfectant Product Code	Component Device Product Code	Classification
NIH: disinfectant, subsystem, water purification	**FIP**: subsystem, water purification	21 CFR 876.5665 Water purification system for hemodialysis
NII: disinfectant, dialysate delivery system	**FKP**: system, dialysate delivery, single patient	21 CFR 876.5820 Hemodialysis system and accessories
NII: disinfectant, dialysate delivery system	**FKQ**: system, dialysate delivery, central multiple patient **KDI**:- dialyzer, high permeability with or without sealed dialysate system	21 CFR 876.5860 High permeability hemodialysis system

The Least Burdensome Approach

The issues identified in this guidance document represent those that we believe need to be addressed before your device can be marketed. In developing the guidance, we carefully considered the relevant statutory criteria for Agency decision-making. We also considered the burden that may be incurred in your attempt to comply with the guidance and address the issues we have identified. We believe that we have considered the least burdensome approach to resolving the issues presented in the guidance document. If, however, you believe that there is a less burdensome way to address the issues, you should follow the procedures outlined in the "A Suggested Approach to Resolving Least Burdensome Issues" document. It is available on our Center web page at: http://www.fda.gov/cdrh/modact/leastburdensome.html.

Background

On June 8, 2000, FDA classified two categories of germicides, liquid chemical sterilants/high level disinfectants (21 CFR 880.6885) and general purpose disinfectants (21 CFR 880.6890). In each of these regulations, the germicide is defined as the regulated device and not as an accessory to any device with which it is intended to be used. After germicides were classified, we received several inquiries about the classification of disinfectants intended for use in processing dialysate delivery systems and water treatment systems for hemodialysis. This guidance explains why FDA does not consider the disinfectants shown in Table 1 within either of these classifications.

Liquid Chemical Sterilants and High Level Disinfectants

Germicides that are intended for use as liquid chemical sterilants/high level disinfectants are class II devices and subject to premarket notification requirements. A liquid chemical sterilant/high level disinfectant is described as:

> a germicide that is intended for use as the terminal step in processing critical and semicritical medical devices prior to patient use. Critical devices make contact with normally sterile tissue or body spaces during use. Semicritical devices make contact during use with mucous membranes or nonintact skin (21 CFR 880.6885).

General Purpose Disinfectants

Germicides that are intended for use as general purpose disinfectants are class I devices and exempt from premarket notification procedures.[2] A general purpose disinfectant is described as

> a germicide intended to process noncritical medical devices and equipment surfaces. A general purpose disinfectant can be used to preclean or decontaminate critical or semicritical medical devices prior to terminal sterilization or high level disinfection. Noncritical medical devices make only topical contact with intact skin (21 CFR 880.6890).

Hemodialysis Systems

There are two classifications for hemodialysis systems and their accessories (21 CFR 876.5820 and 876.5860). Both of these classifications describe a hemodialysis system and accessories as a device that is used as an artificial kidney system for the treatment of patients with renal failure or toxemic conditions. It consists of an extracorporeal blood system, a conventional dialyzer, a dialysate delivery system, and accessories. Blood from a patient flows through the tubing of the extracorporeal blood system and accessories to the blood compartment of the dialyzer, is filtered through the membrane of the dialyzer, and then returns through further tubing of the extracorporeal blood system to the patient. At the same time, dialysate flows through the dialyzer in a direction counter-current to that of the flow of blood. The dialyzer consists of two compartments (dialysate and blood) separated by a semipermeable membrane. While the blood components (e.g., red blood cells, platelets) will generally remain in the blood compartment, undesirable substances present in blood (e.g., urea, creatinine) will pass through the semipermeable membrane into the dialysate in the dialysate compartment.

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2 The FDAMA added new section 510(l) to the act (21 U.S.C. 360(l)). Section 510(l) of the act provides that a class I device is exempt from the premarket notification requirements under section 510(k) of the act, unless the device is intended for a use which is of substantial importance in preventing impairment of human health or it presents a potential unreasonable risk of illness or injury.

Dialysate Delivery System

Dialysate delivery systems are part of the hemodialysis system and are specifically described in 21 CFR 876.5820(a)(3) and 876.5860(a)(2). The dialysate delivery system controls and monitors the dialysate circulating through the dialysate compartment of the dialyzer. The conventional dialyzer allows a transfer of water and solutes between the blood and the dialysate through the semipermeable membrane. The dialysate delivery system consists of mechanisms that monitor and control the temperature, conductivity, flow rate, and pressure of the dialysate and circulates dialysate through the dialysate compartment of the dialyzer.

Water Purification System for Hemodialysis

A water purification system for hemodialysis (21 CFR 876.5665) is a device that is intended for use with a hemodialysis system. It is intended to remove organic and inorganic substances and microbial contaminants from water used to dilute dialysate concentrate to form dialysate.

Disinfectants shown in Table 1 are not liquid chemical sterilants/high level disinfectants

Liquid chemical sterilants/high level disinfectants are used in the terminal step in processing critical and semicritical devices. Critical or semicritical devices are those that contact normally sterile tissue or body spaces, mucous membranes, or non-intact skin. Dialysate delivery systems and water purification systems for hemodialysis are not critical or semicritical devices because they do not contact normally sterile tissue or body spaces, mucous membranes, or non-intact skin, and thus, they do not require sterilization or high level disinfection.

The disinfectants shown in Table 1 are not are not intended to sterilize or high level disinfect critical and semicritical devices, therefore these disinfectants are not liquid chemical sterilants/high level disinfectants identified in 21 CFR 880.6885. Section 880.6885 applies only to liquid chemical sterilants/high level disinfectants intended for use in the terminal step in processing critical and semicritical devices.

Disinfectants shown in Table 1 are not general purpose disinfectants

General purpose disinfectants are intended to:

- process noncritical devices
- process equipment surfaces
- preclean or decontaminate critical or semicritical devices prior to terminal sterilization or high level disinfection.

Noncritical devices are those that make only topical contact with intact skin. Dialysate delivery systems and water purification systems for hemodialysis systems are not noncritical devices because they do not contact skin. Further, these devices do not constitute equipment surfaces, nor are they

critical or semicritical devices, for the reasons discussed above. Therefore, disinfectants used with dialysate delivery systems and water purification systems for hemodialysis are not general purpose disinfectants (21 CFR 880.6890).

FDA reviews disinfectants shown in Table 1 as accessories to the devices they disinfect

Although the disinfectants shown in Table 1 do not meet the definition of sterilant or high level disinfectant, because the component devices they disinfect are not critical or semicritical devices, they can have an impact on the exposure of dialysis patients to bacterial toxins and other contaminants. The dialysate produced by the dialysate delivery system with water purified by the water purification system may pick up bacterial toxins or other contaminates from either of these systems. These contaminates potentially can cross the semipermeable membrane to the blood during dialysis. Therefore, we believe that premarket review of disinfectants as accessories to the dialysate delivery systems and water treatment systems for hemodialysis is necessary to help provide reasonable assurance of safety and effectiveness.

Accordingly, FDA continues to regulate these disinfectants as accessories to the devices that they are intended to disinfect. As accessories to the component devices shown in Table 1, these disinfectants are subject to premarket notification requirements. Therefore, manufacturers of the disinfectants shown in Table 1 must submit premarket notification submissions to FDA and receive clearance before marketing their products.