MODULAR ASSEMBLY FOR A PORTABLE HEMODIALYSIS SYSTEM

RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 12/199,068, filed Aug. 27, 2008 which is a continuation-in-part of prior U.S. application Ser. No. 12/072,908, filed Feb. 27, 2008 and issued as U.S. Pat. No. 8,246,826 on Aug. 21, 2012, which claims the benefit of U.S. Provisional Application Ser. No. 60/903,582, filed Feb. 27, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 12/038,474, filed Feb. 27, 2008 and issued as U.S. Pat. No. 8,491,184 on Jul. 23, 2013, which is a continuation-in-part of prior U.S. application Ser. No. 11/871,821, filed Oct. 12, 2007, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 12/038,648, filed Feb. 27, 2008 and issued as U.S. Pat. No. 8,042,563 on Oct. 25, 2011, which is a continuation-in-part of prior U.S. application Ser. No. 11/871,803, filed Oct. 12, 2007 and issued as U.S. Pat. No. 7,967,022 on Jun. 28, 2011, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 11/871,793, filed Oct. 12, 2007 and published as U.S. Patent Application Publication No. 2008/0253912 on Oct. 16, 2008, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 11/871,787, filed Oct. 12, 2007 and published as U.S. Patent Application Publication No. 2008/0253911 on Oct. 16, 2008, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 11/871,712, filed Oct. 12, 2007 and issued as U.S. Pat. No. 8,317,492 on Nov. 27, 2012, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007. U.S. patent application Ser. No. 12/199,068 is also a continuation-in-part of prior U.S. application Ser. No. 11/871,680, filed Oct. 12, 2007 and issued as U.S. Pat. No. 8,273,049 on Sep. 25, 2012, which claims the benefit of U.S. Provisional Application Ser. No. 60/921,314, filed Apr. 2, 2007 and U.S. Provisional Application Ser. No. 60/904,024, filed Feb. 27, 2007.

FIELD OF INVENTION

[0002] The present invention generally relates to hemodialysis and similar dialysis systems, e.g., systems able to treat blood or other bodily fluids extracorporeally.

BACKGROUND

[0003] Many factors make hemodialysis inefficient, difficult, and expensive. These factors include the complexity of hemodialysis, the safety concerns related to hemodialysis, and the very large amount of dialysate needed for hemodialysis. Moreover, hemodialysis is typically performed in a dialysis center requiring skilled technicians. Therefore any increase in the ease and efficiency of the dialysis process could have an impact on treatment cost or patient outcome.

SUMMARY OF INVENTION

[0004] Aspects of the invention generally relate to hemodialysis and similar dialysis systems. Illustrative embodiments described herein involve, in some cases, interrelated products, alternative solutions to a particular problem, and/or a plurality of different uses of one or more systems and/or articles. Although the various systems and methods described herein are described in relation to hemodialysis, it should be understood that the various systems and method described herein are applicable to other dialysis systems and/or in any extracorporeal system able to treat blood or other bodily fluids, such as hemofiltration, hemodiafiltration, etc.

[0005] In one aspect of the invention, an enclosure for containing a portable hemodialysis unit is provided, where the hemodialysis unit includes suitable components for performing hemodialysis including a dialyzer, one or more pumps to circulate blood through the dialyzer, a source of dialysate, and one or more pumps to circulate the dialysate through the dialyzer. The enclosure may include a housing that supports the components of the hemodialysis unit and has a front panel at which blood circuit connections and dialysate fluidic connections are located. For example, the front panel may support blood line connections for patient blood access, connections for a reagent supply, dialyzer connections for both blood flow and dialysate, etc. Thus, in one embodiment, an operator may complete all necessary fluid circuit connections for the blood circuit and reagent supply at the housing front panel. The enclosure may also include a pair of vertical, side-by-side doors hingedly mounted to the housing at opposite sides of the front panel so that the doors are movable between open and closed positions. With the doors in an open position, an operator may have access to the blood circuit connections and dialysate fluidic connections. Also, with the doors in the closed position, access to the patient access and dialysate fluidic connections may be blocked, and the doors may allow for the retention of heat in the housing suitable for disinfection during a disinfection cycle. For example, at least one of the doors may include a seal to resist air exchange between an interior and an exterior of housing when the doors are in the closed position to help retain heat and/or help resist entry of dust, dirt or other contaminants.

[0006] In one embodiment, each of the vertical, side-by-side doors is mounted to the housing via a hinge plate that is pivotally mounted to the door at a first end, and is pivotally mounted to the housing at a second end opposite the first end. Thus, the doors may be positionable at two open positions, e.g., a first open position in which blood circuit connections and dialysate fluidic connections are exposed and the hinge plate is adjacent the housing, and a second open position in which the hinge plate is positioned away from the housing. One or more retainer members may be included to maintain the doors in an open position relative to a corresponding hinge plate. For example, the retainer member may include at least one magnet attached to the door or the hinge plate that tends to keep the door in an open