[0012A] The present disclosure provides a medical simulation system, comprising:

a patient module representing a human body, the patient module comprising:

a fluid circuit coupleable to an extracorporeal membrane oxygenator (ECMO) machine for interactively communicating a fluid therebetween;

a patient display/delivery device; and

a computing device coupled to the patient module and the patient display/delivery device, wherein the computing device includes a processor and a memory coupled to each other; and wherein:

the computing device interacts with the patient module to simulate vital signs of the patient module as the patient module interacts with the ECMO machine; and

the computing device receives physical data from the patient module and provides instructions to the patient module to implement a clinical scenario.

[0012B] The present disclosure further provides a medical simulation system, comprising:

a patient module representing a human body, the patient module comprising:

a fluid circuit coupleable to at least one of a plurality of different types of therapeutic machines for interactively communicating fluid therebetween; and

a computing device coupled to the patient module, wherein the computing device comprises a processor coupled with a memory; and wherein:

the computing device interacts with the patient module to simulate the patient undergoing therapy with the at least one of the plurality of types of therapeutic machines;

the plurality of different types of therapeutic machines is one of an extracorporeal membrane oxygenation (ECMO) machine, and a heart lung machine (HLM);

the at least one clinical scenario is selected based on an identified therapeutic machine chosen from the plurality of different types of therapeutic machines; and

no hardware changes are required to the patient module for any of the plurality of different types of therapeutic machines.

[0012C] The present disclosure also provides a method of programmably implementing one of a plurality of clinical scenario in a simulation system having a patient module coupled to a computing device and to one of a plurality of therapeutic devices, the method comprising:

receiving an input identifying one of the plurality of therapeutic devices as an identified therapeutic device to which the patient module is coupled for the clinical scenario;

receiving an input identifying one of the plurality of clinical scenarios as an identified clinical scenario to be evaluated on the identified therapeutic device;

receiving a sequential step of data from the identified clinical scenario;

reading a data value, contained in the sequential step of data, for at least one control device in the patient module;

reading a data value, contained in the sequential step of data, for at least one physiological condition for the patient module; and

reading a data value, contained in the sequential step of data, for at least one virtual control in the identified therapeutic device for the patient module;

receiving an optional input from an operator, via a patient display/delivery device, of a setting of a virtual variable of the identified therapeutic machine;

sampling a physical data value from the at least one fluid sensor in the patient module;

calculating, via the computing device, a virtual data for the patient module, including at least one of an immediate vital sign and a long-term clinical course of the patient module, in at least one of a cardiovascular system, a respiratory system, a hematological system, and a renal system, by implementing at least one algorithm that evaluates the identified clinical scenario, the physical data from at least one sensor, and the optional input from the operator setting the virtual variable; and wherein:

the plurality of therapeutic machines includes an extracorporeal membrane oxygenation (ECMO) machine, and a heart lung machine (HLM); and

no hardware changes to the patient module are required for running any one of the plurality of therapeutic machines.