

temperature, if necessary, using the environmental control unit 14; removing unwanted fluids, if necessary, using the suction unit 13; defibrillating the patient, if necessary, using the defibrillator unit 15; continuously monitoring hemoglobin oxygen saturation level, using the pulse oximetry sensor 24; continuously monitoring the patient's heart rate, using the electrocardiogram sensor 26; continuously monitoring inspired/expired oxygen content using the inspired/expired oxygen sensor 27, which together with a tidal volume measurement is used to calculate oxygen delivery and oxygen consumption; continuously monitoring placement and patency of an endotracheal tube positioned in the patient's airway and monitoring the adequacy of ventilation and carbon dioxide production using the carbon dioxide sensor 28; continuously monitoring the pressure limits on the ventilator 11 (hypo and/or hyperinflation) and monitoring pulmonary compliance using the air way pressure sensor 29; continuously monitoring air flow to validate air volume delivery, allow calculation of the tidal volume and pulmonary compliance, and to provide alarms for inadequate flow rates; periodically measuring the patient's blood pressure, using the oscillometric blood pressure sensor 25, or continuously calculating a person's blood pressure using the pulse wave transmission technique, which is an estimate of blood pressure based on the time difference between the R-wave of the monitored electrocardiogram and the peak of the peripheral arterial wave form detected by the pulse oximeter; calibrating estimated blood pressure based upon oscillometric blood pressure measurements from the previous step, and administering a resuscitation fluid to the patient in a closed loop fashion using calibrated continuous blood pressure measurements as feedback to drive the fluid and drug infusion pumps 23a and 23b.

The transportable life support system including the equipment described hereinabove, may be controlled automatically by the on-board computer 16, controlled manually by an attending medic or physician, or controlled manually by a remote medic or physician. To aid the manual control of the IV infusion pump 23a, drug infusion pump 23b, the ventilator 11 and the environmental control unit 14, these parameters are displayed locally to the attending medic or physician or are transmitted to the remote medic or physician.

The present invention, allows the medic or physician to provide life supporting techniques and consult with remote medical staff. With the canopy 4, the system 1 provides a stable, preoperative or postoperative recovery platform that simulates an intensive care environment. With the canopy off, the system 1 serves as a self-contained platform during surgical procedures.

What is claimed is:

1. A transportable life support system comprising:

a) a base including:

- i) a ventilator having a means for supplying and maintaining delivery of air, said means constructed so as to direct air down a patient's trachea and lungs, said ventilator may or may not have a carbon dioxide scrubber constructed so as to remove carbon dioxide from expired air when rebreathing of carbon dioxide may be a hazard, a means for filtering intake and exhaust air of contaminants, said ventilator constructed so as to ventilate said patient;
- ii) an oxygen source connected to said ventilator, said oxygen source constructed so as to provide oxygen to said patient;
- iii) an environmental control unit having a means for providing contaminant-free air to the unit, said unit constructed so as to control said patient's temperature;

- iv) a suction unit constructed so as to remove unwanted fluids from the patient;
- v) a defibrillator constructed so as to provide cardioversion for correcting life threatening arrhythmias;
- vi) a monitor comprising a touch screen constructed so as to display vital signs of the patient;
- vii) a receiver/transmitter connected to said monitor, said receiver/transmitter constructed so as to transmit information to, and receive information from, a remote location;
- viii) an on-board computer connected to said ventilator, said oxygen source, and said environmental control unit, said monitor and said receiver/transmitter so as to control care administered to the patient; and
- ix) a power source constructed to operate said ventilator, said oxygen source, said environmental control unit, said suction unit, said defibrillator, said on-board computer, said monitor and said receiver transmitter;

- b) a stretcher removably attached to the base; and
- c) a canopy connected to the base, said canopy and base constructed so as to form a fluid impermeable seal.

2. The device of claim 1, wherein said means for supplying and maintaining delivery of air is selected from a group consisting of a laryngeal mask airway and an endotracheal tube.

3. The device of claim 2, wherein said means for filtering intake and exhaust air of contaminants in said ventilator and said means for providing contaminant-free air to the environmental control unit comprise at least one NBC type filter.

4. The device of claim 3, wherein said oxygen source is an oxygen generator.

5. The device of claim 4, where said environmental control unit further comprises a body temperature sensor.

6. The device of claim 5, where said body temperature sensor is selected from a group consisting of an axillary probe, a rectal probe, and a tympanic sensor.

7. The device of claim 6, wherein said power source further comprises at least one rechargeable battery and a connector constructed so as to receive external power and where said connector is connected to said at least one battery.

8. The device of claim 7, wherein said canopy comprises a hard shell.

9. The device of claim 8, where said environmental control unit comprises a heating/cooling pad.

10. The device of claim 9, where said heating/cooling pad further comprises a temperature sensor, said temperature sensor constructed so as to provide said on-board computer with a temperature reading of said heating/cooling pad.

11. The device of claim 10, where said heating/cooling pad further includes a thermally-controlled fluid constructed so as to circulate through said pad.

12. The device of claim 8, where said environmental control unit further comprises a temperature probe, said temperature probe constructed so as to measure the temperature of air circulating within said transportable life support system.

13. The device of claim 12, where said temperature probe is selected from a group consisting of a thermocouple and a thermistor.

14. A transportable life support system comprising:

a) a base including:

- i) a ventilator having a means for supplying and maintaining delivery of air, said means constructed so as to direct air down a patient's trachea and lungs, said ventilator may or may not have a carbon dioxide