

CLAIMS

1. A smart obturator assembly, comprising:
an obturator positionable within a lumen of a catheter, the obturator comprising:
a distal end having a tip portion at least partially positionable within the lumen, wherein the tip portion comprises a recessed area, wherein a proximal end surface of the recessed area is formed by a wall of the obturator that comprises a plurality of electrical contacts configured to selectively couple to a sensor assembly, wherein the recessed area extends from a distal end surface of the obturator forming a distal opening to the proximal end surface such that the sensor assembly is configured to be inserted proximally into the recessed area; and
a proximal end opposite the distal end; the sensor assembly at the tip portion, wherein the sensor assembly is disposed within the recessed area and contacts the proximal end surface of the recessed area formed by the wall of the obturator, wherein a proximal end surface of the sensor assembly comprises a plurality of other electrical contacts aligned with the plurality of electrical contacts, the sensor assembly configured to sense one or more environmental characteristics within a patient's blood vessel and to generate one or more signals representative of the one or more environmental characteristics;
electronic circuitry operatively coupled in signal communication with the sensor assembly, the electronic circuitry configured to receive the one or more signals and to at least one of transmit the one or more signals to remote reception circuitry or display a datum representative of the one or more environmental characteristics on a display of the smart obturator assembly, wherein the electronic circuitry comprises a plurality of lead wires extending from the plurality of contacts of the proximal end surface.
2. The smart obturator assembly of claim 1, further comprising a hub operatively coupled to the obturator, wherein the electronic circuitry is located in the hub.
3. The smart obturator assembly of claim 1, further comprising communication circuitry coupled in signal communication with the electronic circuitry for wireless communication with the remote reception circuitry.

4. The smart obturator assembly of claim 3, wherein the communication circuitry comprises a wired or wireless connection to a network.

5. The smart obturator assembly of claim 1, further comprising a connection port for connecting the electronic circuitry with the remote reception circuitry.

6. The smart obturator assembly of claim 1, further comprising a power source electrically coupled to the electronic circuitry to provide power to at least one of the electronic circuitry or the sensor assembly.

7. The smart obturator assembly of claim 6, wherein the power source is one of integral to a hub coupled to the obturator or externally coupled to the hub.

8. The smart obturator assembly of claim 1, wherein the device comprises a catheter forming the lumen and having a distal end, wherein the sensor assembly is flush with the distal end of the catheter, proud of the distal end of the catheter or recessed in the lumen.

9. The smart obturator assembly of claim 1, wherein the sensor assembly comprises a sensor positioned on a distal end surface of the sensor assembly.

10. The smart obturator assembly of claim 1, wherein the sensor assembly comprises one or more sensors configured to measure at least one of the following environmental characteristics: a temperature within a body lumen, a blood glucose level, a sodium level, a potassium level, a drug concentration level, a white blood cell count, a blood pressure within the body lumen, or a combination thereof.

11. The smart obturator assembly of claim 1, wherein the sensor assembly comprises one or more of the following sensors: a temperature sensor, a sensor that senses a chemical within a patient's blood, a sensor that senses a marker in the patient's blood, a sensor that senses a protein in the patient's blood, or a combination thereof.

12. An obturator positionable within a lumen of a catheter, the obturator comprising:

a distal end having a tip portion at least partially positionable within the lumen, wherein the tip portion comprises a recessed area, wherein a proximal end surface of the recessed area is formed by a wall of the obturator that comprises a plurality of electrical contacts configured to selectively couple to a sensor assembly, wherein the recessed area extends from a distal ~~an outer~~ end surface of the obturator forming a distal opening to the proximal end surface such that a sensor assembly is configured to be inserted proximally into the recessed area;

a proximal end opposing the distal end;

a sensor assembly at the tip portion, wherein the sensor assembly is disposed within the recessed area and contacts the proximal end surface of the recessed area, wherein a proximal end surface of the sensor assembly comprises a plurality of other electrical contacts aligned with the electrical contacts, the sensor assembly configured to sense one or more environmental characteristics, generate one or more signals representative of the one or more environmental characteristics, and transmit the one or more signals to electronic circuitry coupled in signal communication with the sensor assembly, the electronic circuitry configured to receive the one or more signals and transmit the one or more signals to remote reception circuitry.

13. The obturator of claim 12, further comprising a hub at the proximal end, the hub including a power source electrically coupled to the electronic circuitry to provide power to the electronic circuitry.

14. The smart obturator assembly of claim 1, wherein an inner surface forming the recessed area is cylindrical between the distal end surface and the proximal end surface, wherein the inner surface abuts the proximal end surface.

15. The smart obturator assembly of claim 1, wherein a distal end surface of the sensor assembly is flush with a distal end surface of the obturator at the distal end.

16. The smart obturator assembly of claim 14, wherein the proximal end surface is generally transverse to a longitudinal axis of the obturator.

17. The obturator of claim 12, wherein an inner surface forming the recessed area is cylindrical between the outer end surface and the proximal end surface, wherein the inner surface

abuts the proximal end surface, wherein the proximal end surface is generally transverse to a longitudinal axis of the obturator.