CLAIMS

What is claimed is:

1. Integrated tubing, comprising:

a tubing wall of the integrated tubing;

one or more lumens of the integrated tubing, each lumen of the one or more lumens defined at least in part by the tubing wall; ~~and~~

a plurality of bumps in diameter, each bump of the plurality of bumps occurring within a predetermined length of the integrated tubing; and

a longitudinal bead of the integrated tubing between opposing sides of the tubing wall, the longitudinal bead including one or more optical fibers disposed therein.

~~2. The integrated tubing of claim 1, wherein the integrated tubing has one lumen.~~

~~3. The integrated tubing of claim 2, wherein the longitudinal bead is incorporated into the tubing wall.~~

~~4. The integrated tubing of claim 1, wherein the integrated tubing has two or more lumens.~~

~~5. The integrated tubing of claim 4, wherein each lumen of the two or more lumens has approximately a same volume as another lumen of the two or more lumens in an arbitrary length of the integrated tubing.~~

~~6. The integrated tubing of claim 4, wherein at least one lumen of the two or more lumens has a different volume than another lumen of the two or more lumens in an arbitrary length of the integrated tubing.~~

~~7. The integrated tubing of any claim of claims 4-6, further comprising one or more septa of the integrated tubing, each lumen of the two or more lumens further defined at least in part by the one or more septa.~~

~~8. The integrated tubing of claim 7, wherein the longitudinal bead is incorporated into the tubing wall.~~

~~9. The integrated tubing of claim 7, wherein the longitudinal bead is incorporated into at least one septum of the one or more septa.~~

~~10. The integrated tubing of claim 7, wherein the longitudinal bead is incorporated into each septum of the one or more septa.~~

~~11. The integrated tubing of any claim of claims 1-10, wherein the longitudinal bead has one optical fiber disposed therein.~~

~~12. The integrated tubing of any claim of claims 1-10, wherein the longitudinal bead has a bundle of optical fibers disposed therein.~~

~~13~~2. The integrated tubing of ~~any claim of claims 1-12~~claim 1, wherein the integrated tubing is ~~bump tubing~~cut into a plurality of catheter tubes, each catheter tube including a bump in diameter between a distal-end portion of the catheter tube and a proximal-end portion of the catheter tube.

~~14~~3. A medical device, comprising:

a catheter tube including:

a catheter-tube wall of the catheter tube; ~~and~~

one or more lumens of the catheter tube, each lumen of the one or more lumens defined at least in part by the catheter-tube wall; and

a bump in diameter between a distal-end portion of the catheter tube and a proximal-end portion of the catheter tube; and

an integrated stylet of one or more optical fibers, the catheter tube including a longitudinal bead between opposing sides of the catheter tube having the one or more optical fibers disposed therein.

~~15~~4. The medical device of claim ~~14~~3, wherein the catheter tube has one lumen.

~~16~~5. The medical device of claim ~~15~~4, wherein the longitudinal bead is incorporated into the catheter-tube wall.

~~17~~6. The medical device of claim ~~15~~3, wherein the catheter tube has two or more lumens.

~~18~~7. The medical device of claim ~~17~~6, wherein each lumen of the two or more lumens has approximately a same volume as another lumen of the two or more lumens in an arbitrary length of the catheter tube.

~~19~~8. The medical device of claim ~~17~~6, wherein at least one lumen of the two or more lumens has a different volume than another lumen of the two or more lumens in an arbitrary length of the catheter tube.

~~20~~9. The medical device of ~~any claim of claims~~ claim 6~~17-19~~, further comprising one or more septa of the catheter tube, each lumen of the two or more lumens further defined at least in part by the one or more septa.

~~21~~10. The medical device of claim ~~20~~9, wherein the longitudinal bead is incorporated into the catheter-tube wall.

~~22~~11. The medical device of claim ~~20~~9, wherein the longitudinal bead is incorporated into at least one septum of the one or more septa.

~~23~~12. The medical device of claim ~~20~~9, wherein the longitudinal bead is incorporated into each septum of the one or more septa.

~~24~~13. The medical device of any claim of claims ~~14-23~~3-12, wherein the longitudinal bead has one optical fiber disposed therein.

~~25~~14. The medical device of any claim of claims ~~14-23~~3-12, wherein the longitudinal bead has a bundle of optical fibers disposed therein.

~~26~~15. The medical device of any claim of claims ~~14-25~~3-14, wherein ~~a~~ the distal-end portion of the catheter tube has a smaller diameter than ~~a~~ the proximal-end portion of the catheter tube, the distal-end portion of the catheter tube configured to interface with a patient's anatomy and the proximal-end portion of the catheter tube configured to interface with procedural equipment or instrumentation.

~~27~~16. The medical device of any claim of claims ~~14-26~~3-15, wherein the medical device is a peripherally inserted central catheter or a central venous catheter.

~~28~~17. A method for manufacturing integrated tubing, comprising:

threading at least one optical fiber through a die of an extruder;

forcing a molten polymeric material through the die around the optical fiber to form the integrated tubing with the optical fiber disposed within a longitudinal bead of the integrated tubing; and

cooling the integrated tubing in a cooling bath by pulling the integrated tubing through the cooling bath with a puller, wherein the rate of pulling the integrated tubing with the puller is varied to create a plurality of bumps in diameter of the integrated tubing, each bump of the plurality of bumps occurring within a predetermined length of the integrated tubing.

~~29. The method of claim 28, further comprising coiling the integrated tubing onto a spool of the integrated tubing with a coiler.~~

~~30~~18. The method of claim ~~28~~17, wherein ~~a~~the rate of pulling the integrated tubing with the puller is increased to create portions of the integrated tubing with a smaller diameter or decreased to create portions of the integrated tubing with a larger diameter.

~~31. The method of claim 30, further comprising cutting the integrated tubing into predetermined lengths of the integrated tubing with a cutter.~~

~~32. The method of claim 31, wherein the cutter is synchronized with the puller such that each predetermined length of the integrated tubing includes a first end portion of the predetermined length having a smaller diameter than a second end portion of the predetermined length.~~

33. The method of claim 32, wherein each predetermined length of the integrated tubing is a catheter tube, the first end portion of the predetermined length of the integrated tubing being a distal end portion of the catheter tube configured to interface with a patient's anatomy and the second end portion of the predetermined length of the integrated tubing being a proximal end portion of the catheter tube configured to interface with procedural equipment or instrumentation.