WE CLAIM:

1. A steerable catheter device, comprising:

a shaft comprising a proximal portion, a distal portion, and a pull-wire lumen that extends at least partially through the proximal and distal portions;

a pull wire extending through the pull-wire lumen and having a proximal end portion and a distal end portion, wherein the distal end portion of pull wire is fixed to the distal portion of the shaft;

an adjustment mechanism operatively connected to the proximal end portion of the pull wire and configured to increase and decrease tension in the pull wire to adjust the curvature of the distal portion of the shaft; and

an axially non-compressible pull-wire sleeve extending co-axially through the pull-wire lumen and over the pull wire;

wherein the pull-wire sleeve comprises a distal terminal end that is fixed relative to the shaft inside of the pull-wire lumen and a proximal terminal end that is fixed relative to the shaft, and the pull-wire sleeve is unattached to the pull-wire lumen between the distal terminal end and the proximal terminal end.

2. The catheter device of claim 1, wherein the pull-wire sleeve comprises a closed-pitch coil.

3. The catheter device of any preceding claim, wherein the pull-wire sleeve is free-floating within the pull-wire lumen.

4. The catheter device of any preceding claim, wherein the pull-wire sleeve comprises a proximal end portion that extends outside of and alongside the shaft and the pull wire extends proximally past the proximal end portion of the pull-wire sleeve.

5. A steerable catheter device, comprising:

a shaft comprising a proximal portion, a distal portion, and a pull-wire lumen that extends at least partially through the proximal and distal portions;

a pull wire extending through the pull-wire lumen and having a proximal end portion and a distal end portion, wherein the distal end portion of pull wire is fixed to the distal portion of the shaft;

an adjustment mechanism operatively connected to the proximal end portion of the pull wire and configured to increase and decrease tension in the pull wire to adjust the curvature of the distal portion of the shaft; and

an axially non-compressible pull-wire sleeve extending co-axially through the pull-wire lumen and over the pull wire;

wherein the pull-wire sleeve comprises a proximal end portion that extends outside of and alongside the shaft and the pull wire extends proximally past the proximal end portion of the pull-wire sleeve; and

a handle and a stop member fixed relative to the shaft at a location distal to the handle, and wherein the pull-wire sleeve has a proximal terminal end fixed to the stop member, and the pull wire extends proximally through the stop member and into the handle.

6. The catheter device of claim 4, wherein the proximal end portion of the pull-wire sleeve extending outside of the shaft is longer than a section of the shaft measured from a first location where the pull-wire sleeve first extends outside of the shaft to a second location at a proximal terminal end of the pull-wire sleeve.

7. The catheter device of claim 1, wherein the pull wire extends distally past the pull-wire sleeve into a distal section of the pull-wire lumen not occupied by the pull-wire sleeve.

8. The catheter device of any preceding claim, wherein the shaft comprises a first shaft and the catheter device further comprises a second shaft and another adjustment mechanism configured to adjust the curvature of a distal portion of the second shaft, the first shaft extending co-axially through and distally past the second shaft such that the curvature of the distal portion of the first shaft can be adjusted relative to the second shaft.

9. The catheter device of any preceding claim comprising only one pull wire.