

described in Example 1 except that Hydromer™ polyvinylpyrrolidone hydrophilic coating is used as the top coat instead of the Polyslip™ T-503M described above. Half of the balloons were then coated in a 4% solution of Carbowax® Polyethylene Glycol 8000 in an aqueous solution of a mixture of phosphate salts of an alkali metal and then subjected to a 1 hour baking step as described above. To reduce the profile of the product prior to sterilization and use in a medical procedure, the balloons were folded as in FIG. 1 for insertion into a protective cover.

After sterilization, the balloons were inflated. All of the samples which received the subsequent treatment in the 4% solution of Carbowax® Polyethylene Glycol 8000 opened without the hydrophilic coating sticking to itself. The balloons had a normal plastic feel when dry, and subsequently would become instantly lubricious upon exposure to water or body fluids. Of the samples which did not receive the subsequent treatment in the 4% solution of Carbowax® Polyethylene Glycol 8000, 15% showed signs of the coating adhering to itself.

It is apparent that modifications and changes can be made within the spirit and scope of the present invention but it is our intention, however, only to be limited by the scope of the appended claims.

As our invention we claim.

1. A medical device for insertion into the body of a mammal, comprising a first polymeric surface which is at least periodically subjected to contacting with a second polymeric surface; said first polymeric surface comprising:

(A) a first hydrophilic coating disposed on said first polymeric surface; and

(B) a lubricious, blood-compatible second coating comprising a polyalkylene glycol or alkoxy polyalkylene glycol having a molecular weight of from about 100 to 30,000 grams per gram mole, said blood-compatible coating disposed at least partially upon and adhering to said first coating,

wherein said second coating is present to inhibit said first surface and said second surface from adhering to each other.

2. The medical device according to claim 1 wherein said first coating is a lubricious, biocompatible, hydrophilic polymer.

3. The medical device according to claim 2 wherein the blood-compatible coating comprises polyethylene glycols, methoxy polyethylene glycols or mixtures thereof having a molecular weight between about 100 and 20,000 grams per gram mole.

4. The medical device according to claim 1 wherein the blood-compatible coating has a thickness greater than about 1 μ m.

5. The medical device according to claim 2 wherein the lubricious, biocompatible, hydrophilic polymer comprises at least one polycarboxylic acid.

6. The medical device according to claim 1 further comprising a primer coating beneath said first coating, said primer coating comprising a polyisocyanate.

7. The medical device according to claim 2 wherein the lubricious, biocompatible, hydrophilic coating is formed of an admixture of polymers of polycarboxylic acid and polyisocyanate.

8. The medical device according to claim 1 wherein the second coating comprises polyethylene glycols, methoxy polyethylene glycols or mixtures thereof having a molecular weight between about 100 and 20,000 grams per gram mole.

9. The medical device according to claim 8 wherein the second coating further comprises a polycarboxylic acid.

10. The medical device according to claim 1 wherein said balloon is folded upon itself for storage and insertion into the body, said first polymeric surface and said second polymeric surface comprising abutting portions of an outer surface of said balloon.

11. The medical device according to claim 1 which is a balloon.

12. The medical device according to claim 11 wherein said balloon is folded upon itself for storage and insertion into the body, said first polymeric surface and said second polymeric surface comprising abutting portions of an outer surface of said balloon.

13. The medical device according to claim 12 wherein said balloon has a distal and a proximal end, and further including a shaft having at least one internal lumen disposed therein, said lumen being in fluid flow communication with the proximal end of said balloon whereby to provide for the introduction of inflation fluids.

14. The medical device according to claim 1 which is a catheter.

15. The medical device according to claim 14 wherein said first polymeric surface comprises a portion of an outer surface of said catheter.

16. The medical device according to claim 15 wherein said second polymeric surface comprises a different portion of said outer surface of said catheter.

17. The medical device according to claim 15 wherein said second polymeric surface comprises a portion of an outer surface of a different catheter in contact with said catheter.

18. A medical balloon folded upon itself for storage and insertion into the body, said balloon being substantially free of bridging and adhesion between abutting surfaces, said balloon comprising:

a continuous polymeric surface expandable from a folded, wrapped configuration with outer surfaces touching each other into a balloon when inflated;

a lubricious, biocompatible, hydrophilic coating disposed on the outer surfaces of said polymeric surface;

a thin, lubricious coating of a polyalkylene glycol or alkoxy polyalkylene glycol disposed upon and adhering to said hydrophilic coating to prevent abutting surfaces of said polymeric surface from adhering to each other and delaminating said hydrophilic coating from said polymeric surface during inflation.

19. The balloon according to claim 18 further comprising a catheter shaft having a lumen therein in open communication with said balloon.

20. A medical balloon used for catheters where the balloon is folded for insertion into the body, said balloon being free of bridging and adhesion between abutting surfaces when expanded, said balloon comprising:

a continuous polymeric surface including polyethylene terephthalate that is expandable from the folded configuration with surfaces touching each other into a generally cylindrically-shaped balloon when inflated;

a lubricious, biocompatible, hydrophilic coating disposed on outer surfaces of said polymeric surface said coating comprising at least one polymer selected from the group consisting of:

(A) water soluble polymers of generally chain-structured, non-crosslinked polymers having a hydrophilic group such as —OH, —CONH₂, —COOH, —NH₂, —COO—, —SO₃, and —NR₃⁺, where R is alkyl or hydrogen,

(B) natural polymers of cellulose, carboxymethyl cellulose, methyl cellulose, hydroxyethyl cellulose and hydroxypropyl cellulose,