SUMMARY ~~OF THE INVENTION~~

In a first~~one~~ aspect, the present disclosure~~invention~~ provides a coaxial infusion catheter system comprising:

a) an occlusion catheter component; and

b) an infusion catheter component, wherein at least a portion of the occlusion catheter is coaxially positioned within the infusion catheter, wherein the occlusion catheter provides for occlusion of a vessel or graft distal to an occlusion, wherein a composition comprising a thrombolytic agent can be infused into an annular fluid passageway between the outer wall of the occlusion catheter and the inner wall of the infusion catheter thereby providing the agent to a treatment zone.

In a second aspect, the present disclosure provides a sheath for use with the system as defined herein, wherein the sheath has an occlusion chamber disposed about a distal region of its shaft, wherein the sheath provides for occlusion of a vessel or graft proximal to an occlusion.

In a third~~another~~ aspect, the present disclosure~~invention~~ provides an infusion catheter for delivering a thrombolytic agent to an occlusion in a vessel or graft, wherein the catheter comprises:

(a) an infusion zone; and

(b) an occlusion chamber disposed about an outer surface of its shaft about a region proximal to the infusion zone.

In a fourth aspect, the present disclosure provides an infusion system comprising the catheter as defined herein, wherein the system further comprises an occluding wire configured to substantially or completely seal a distal end of the infusion catheter.

In a fifth~~some~~ aspects, the present disclosure~~invention~~ provides an infusion catheter for delivering a thrombolytic agent to an occlusion in a vessel or graft, wherein the catheter comprises:

(a) an infusion zone; and

(b) an occlusion chamber disposed about an outer surface of its shaft about a region distal to the infusion zone.

In a six~~thother~~ aspects, the present disclosure~~invention~~ provides a coaxial infusion catheter system comprising:

(a) an infusion catheter component having a infusion zone for infusing a thrombolytic agent to an occlusion in a vessel or a graft; and

(b) an occluding catheter component having an elongate body, wherein an expandable occluding element is coupled to a distal end of the elongate body, wherein the element when expanded and in an open configuration is capable of occluding a vessel or graft distal to a treatment zone, wherein the element when expanded and in a closed position is capable of allowing blood flow through the treatment zone.

We claim:

1. A coaxial infusion catheter system comprising:

a) an occlusion catheter component; and

b) an infusion catheter component, wherein at least a portion of the occlusion catheter is coaxially positioned within the infusion catheter, wherein the occlusion catheter provides for occlusion of a vessel or graft distal to an occlusion, wherein a composition comprising a thrombolytic agent can be infused into an annular fluid passageway between the outer wall of the occlusion catheter and the inner wall of the infusion catheter thereby providing the agent to a treatment zone.

2. The coaxial infusion catheter system of claim 1 further comprising a sheath having an occlusion chamber disposed about a distal region of its shaft, wherein the sheath provides for occlusion of a vessel or graft proximal to the occlusion.

3. The system of claim 2, wherein the occlusion chamber is an inflatable balloon.

4. The system of claim 1, wherein the thrombolytic agent is a plasmin.

5. The system of claim 1, wherein the occlusion is an acute peripheral arterial occlusion (aPAO).

6. A sheath for use with the system of claim 1, wherein the sheath has an occlusion chamber disposed about a distal region of its shaft, wherein the sheath provides for occlusion of a vessel or graft proximal to an occlusion.

7. The sheath of claim 6, wherein the occlusion chamber is an inflatable balloon.

8. An infusion catheter for delivering a thrombolytic agent to an occlusion in a vessel or graft, wherein the catheter comprises (a) an infusion zone; and (b) an occlusion chamber disposed about an outer surface of its shaft about a region proximal to the infusion zone.

9. The catheter of claim 8, wherein the occlusion chamber is an inflatable balloon.

10. An infusion system comprising the catheter of claim 8, wherein the system further comprises an occluding wire configured to substantially or completely seal a distal end of the infusion catheter.

11. An infusion catheter for delivering a thrombolytic agent to an occlusion in a vessel or graft, wherein the catheter comprises (a) an infusion zone; and (b) an occlusion chamber disposed about an outer surface of its shaft about a region distal to the infusion zone.

12. The catheter of claim 11, wherein the occlusion chamber is an inflatable balloon.

13. A coaxial infusion catheter system comprising:

a) an infusion catheter component having a infusion zone for infusing a thrombolytic agent to an occlusion in a vessel or a graft; and

b) an occluding catheter component having an elongate body, wherein an expandable occluding element is coupled to a distal end of the elongate body, wherein the element when expanded and in an open configuration is capable of occluding a vessel or graft distal to a treatment zone, wherein the element when expanded and in a closed position is capable of allowing blood flow through the treatment zone.

14. The system of claim 13, wherein the expandable occluding element is capable of trapping an emboli.

15. The system of claim 14, wherein the emboli is at least 50 micrometers.

16. The system of claim 13, wherein the occlusion is an acute peripheral arterial occlusion (aPAO).

17. The system of claim 13, wherein the expandable occluding element is a dischargeable umbrella.