WHAT IS CLAIMED IS:

1. A balloon catheter system for insertion into a patient comprising:

a balloon catheter comprised of **a tube** having **a first end**, **a second end** opposite of the first end, **a central bore** fluidically coupling **an inlet** at the first end of the tube with **an outlet** at the second end of the tube and **a lumen** fluidically coupling **a connector** disposed adjacent the first end of the tube with **a balloon** disposed adjacent to the second end of the tube, the balloon being formed by **a tubular film** sealed at **opposite ends** of the tubular film to **an external surface** of the tube, the lumen having **a lumen outlet** such that fluid injected into the connector and through the lumen exits through the external surface of the tube at the outlet and into **an expandable cavity** between the balloon, which is made of **a flexible, resilient material**, and the external surface of the tube, whereby the balloon is capable of being expanded by injecting fluid into the expandable cavity through the lumen;

a detachable dilator coupled to the outlet of the tube, such that the dilator is held in place during insertion of the tube, and after the tube is inserted, the dilator is detached from the tube, the dilator comprises **a sheath portion** and **a nose**, the nose having **an external surface** that transitions from **a first external diameter** at **a nose tip** to **a second external diameter** at **a portion of the nose** adjacent to the outlet of tube, when the dilator is coupled to the outlet of the tube, and **an internal surface** providing **a channel** through the nose, the sheath portion extending from the nose and over the outlet of the tube and over at least a portion of the balloon; and

an annular shaft inserted through the central bore of the tube and through at least a portion of the channel of the nose, when the dilator is coupled to the outlet of the tube, and the annular shaft is capable of being removed from the central bore of the tube, after the tube is inserted into the patient, by pulling on **an extraction portion** of the annular shaft extending from the inlet of the tube.

2. The balloon catheter system of claim 1, wherein the annular shaft is of a stainless steel.

3. The balloon catheter system of claim 2, wherein the annular shaft has a pointed tip extending from the nose of the dilator, when the dilator is coupled to the outlet of the tube.

4. The balloon catheter system of claim 1, wherein the dilator is detachable from the tube using only the annular shaft.

5. The balloon catheter system of claim 1, further comprising **a detachment mechanism,** the detachment mechanism comprising **a tubular annulus** having **an inner bore diameter** fitting over the annular shaft and **a distal end** capable of contacting the dilator, whereby the detachment mechanism is capable of detaching the dilator from the tube.

6. The balloon catheter system of claim 5, wherein the detachment mechanism includes **a control mechanism** at **a proximal end** of the tubular annulus of the detachment mechanism.

7. The balloon catheter system of claim 6, wherein the control mechanism includes a locking mechanism.

8. The balloon catheter system of claim 7, wherein the control mechanism prevents the distal end from pushing the dilator, whereby the dilator is detached from the tube, until the tubular annulus is rotated about a longitudinal axis of the tubular annulus.

9. The balloon catheter system of claim 1, wherein the sheath portion of the dilator is formed of a flexible, resilient material, and the sheath portion closes in on itself, when the dilator is detached from the tube.

10. The balloon catheter system of claim 9, wherein the dilator is made of a digestible material.

11. A method of assembling the balloon catheter system of claim 1, comprising:

inserting the annular shaft through the central bore of the tube and through at least a portion of the channel of the nose; and

coupling the dilator to the outlet of the tube such that the sheath portion of the dilator extends over the outlet of the tube and over at least a portion of the balloon.

12. The method of claim 11, wherein the sheath portion of the dilator is formed of a flexible, resilient material, and the sheath portion closes in on itself, prior to coupling the dilator to the

outlet of the tube; and the step of coupling includes unfolding and spreading the sheath portion and inserting the outlet of the tube into the sheath portion of the dilator.

13. A method of using the balloon catheter system of claim 1, comprising:

selecting a pre-assembled balloon catheter system;

threading a guide wire through the annular shaft;

inserting the dilator, the tube and the annular shaft along the guide wire and into a cavity within the patient, until the balloon is within the cavity;

detaching the dilator from the tube;

extracting the annular shaft from the tube; and

expanding the balloon by injecting fluid into the expandable cavity between the balloon and the external surface of the tube.

14. The method of claim 13, further comprising:

inserting a retractable net into the cavity of the patient;

capturing the dilator in the retractable net; and

removing the retractable net and the dilator in the retractable net.

15. The method of claim 13, wherein the step of detaching uses a control mechanism of the balloon catheter system, and the step of detaching is comprised of:

unlocking the control mechanism;

withdrawing the control mechanism beyond a detent in the control mechanism;

rotating the control mechanism about an axis of the control mechanism; and

pushing the dilator away from the outlet of the tube.

CLAIMS

1. A balloon catheter system for insertion into a patient comprising:

a balloon catheter (30) comprised of a tube having a first end, a second end opposite of the first end, a central bore fluidically coupling an inlet at the first end of the tube with an outlet at the second end of the tube and a lumen fluidically coupling a connector disposed adjacent the first end of the tube with a balloon (38) disposed adjacent to the second end of the tube, the balloon (38) being formed by a tubular film sealed at opposite ends of the tubular film to an external surface of the tube, the lumen having a lumen outlet such that fluid injected into the connector and through the lumen exits through the external surface of the tube at the outlet and into an expandable cavity between the balloon (38), which is made of a flexible, resilient material, and the external surface of the tube, whereby the balloon (38) is capable of being expanded by injecting fluid into the expandable cavity through the lumen;

a detachable dilator (10) adapted for being coupled to the outlet of the tube, such that the dilator (10) is held in place during insertion of the tube, and adapted for being detached from the tube after the tube is inserted, wherein the dilator (10) comprises a sheath portion (12) and a nose (14), die nose (14) having an external surface that transitions from a first external diameter at a nose tip to a second external diameter at a portion of the nose adjacent to the outlet of tube, when the dilator (10) is coupled to the outlet of the tube, and an internal surface providing a channel through the nose (14), the sheath portion (12) extending from the nose (14) and over the outlet of the tube and over at least a portion of the balloon (38)

an annular shaft (20, 61) adapted for being inserted through the central bore of the tube and through at least a portion of the channel of the nose (14), when the dilator (10) is coupled to the outlet of the tube, and the annular shaft (20) is capable of being removed from the central bore of the tube, after the tube is inserted into the patient, by pulling on an extraction portion (24) of the annular shaft (20,61) extending from the inlet of the tube; and

a detachment mechanism (60,70), the detachment mechanism comprising a tubular annulus (61) having an inner bore diameter fitting over the annular shaft (20) and a distal end capable of contacting the dilator (10), whereby the detachment mechanism (60,70) is capable of detaching the dilator (10) from the tube.

2. The balloon catheter system of claim 1, wherein the annular shaft (20) is of a stainless steel.

3. The balloon catheter system of claim 2, wherein the annular shaft (20) has a pointed tip (22) extending from the nose (14) of the dilator (10), when the dilator (10) is coupled to the outlet of the tube.

4. The balloon catheter system of claim 1, wherein the dilator (10) is detachable from the tube by using only the annular shaft (20).

5. The balloon catheter system of claim 1, wherein the detachment mechanism (60,70) includes a control mechanism at a proximal end of the tubular annulus (61) of the detachment mechanism.

6. The balloon catheter system of claim 5, wherein the control mechanism includes a locking mechanism.

7. The balloon catheter system of claim 6, wherein the control mechanism prevents the distal end from pushing the dilator (10), whereby the dilator (10) is detached from the tube, until the tubular annulus (61) is rotated about a longitudinal axis of the tubular annulus (61).

8. The balloon catheter system of claim 1, wherein the sheath portion (12) of the dilator (10) is formed of a flexible, resilient material, and the sheath portion (12) closes in on itself, when the dilator (10) is detached from the tube.

9. A method of assembling the balloon catheter system of claim 1, comprising:

inserting the annular shaft (20,61) through the central bore of the tube and through at least a portion of the channel of the nose (14) of the dilator (10); and

coupling the dilator (10) to the outlet of the tube such that the sheath portion (12) of the dilator extends over the outlet of the tube and over at least a portion of the balloon (38).

10. The method of claim 9, wherein the sheath portion (12) of the dilator (10) is formed of a flexible, resilient material, and the sheath portion (12) closes in on itself, prior to coupling the dilator (10) to the outlet of the tube; and the step of coupling includes unfolding and spreading the sheath portion (12) and inserting the outlet of the tube into the sheath portion (12) of the dilator (10).