CLAIMS

1. A stopcock medical connector device, comprising:

a housing having a proximal opening, a distal end, and an inner lumen extending therebetween, wherein the housing further comprises:

an upstream port having a hollow interior in fluid communication with the inner lumen;

a downstream port having a hollow interior in fluid communication with the inner lumen, wherein the downstream port is parallel to the upstream port; and

a middle port having a hollow interior in fluid communication with the inner lumen; and

a tap rotatably seated in the inner lumen of the housing and comprising a shaft having an outer surface comprising;

a fluid channel formed on the outer surface of the shaft, the fluid channel having a length greater than half a circumference of the shaft, the fluid channel providing a fluid pathway substantially free of flow restrictions between the hollow interior of the middle port and the hollow interior of the downstream port when the tap is rotated to a first position, the outer surface of tap preventing fluid communication between the downstream and upstream ports when the tap is rotated to the first position, and wherein when the tap is rotated to a second position, the fluid channel is in fluid communication with only one of the upstream port, the downstream port, and the middle port; and

an antimicrobial groove formed in the outer surface of the shaft and positioned such that the antimicrobial groove is in fluid communication with the upstream port when the tap is in the first position, the antimicrobial groove comprising an antimicrobial material in contact with a fluid within the upstream port when the tap is in the first position, wherein a length of the antimicrobial groove is less than a length of the fluid channel.

2. The device of claim 1, further comprising the antimicrobial material applied to the fluid channel, wherein a fluid passing through the fluid channel contacts the antimicrobial material.

3. The device of claim 1, wherein the antimicrobial material comprises at least one of a cured coating, a lubricant, a soluble coating, and an insoluble coating.

4. The device of claim 1, wherein at each point of rotation for the shaft within the inner lumen, the upstream, downstream, and middle ports are in contact with the antimicrobial material in at least one of the fluid channel and the antimicrobial groove.

5. The device of claim 1, wherein the fluid pathway extends between the shaft and an inner surface of the housing, and wherein the inner surface of the

housing is interposed between at least two ports.

6. A method for manufacturing a stopcock medical connector, the method comprising steps for:

providing a housing having a proximal opening, a distal end, and an inner lumen

extending therebetween, the housing further comprising:

an upstream port having a hollow interior in fluid communication with the inner

lumen;

a downstream port parallel to the upstream port, the downstream port having a

hollow interior in fluid communication with the inner lumen; and

a middle port having a hollow interior in fluid communication with the inner

lumen;

rotatably seating a tap in the inner lumen of the housing, the tap comprising a shaft

having an outer surface; and

forming a fluid channel in the outer surface of the tap, the fluid channel providing a fluid pathway substantially free of flow restrictions between the hollow interior of the middle port and the hollow interior of the downstream port when the tap is rotated to a first position, the fluid channel having a length greater than half a circumference of the shaft, the outer surface of the tap preventing fluid communication between the downstream and upstream ports when the tap is rotated to the first position, and wherein when the tap is rotated to a second position, the fluid channel is in fluid communication with only one of the upstream port, the downstream port, and the middle port;

forming an antimicrobial groove formed in the outer surface of the shaft, wherein the antimicrobial groove is in fluid communication with the upstream port when the tap is in the first position, the antimicrobial groove comprising an antimicrobial material in contact with a fluid within the upstream port when the tap is in the first position, wherein a length of the antimicrobial groove is less than a length of the fluid channel.

7. The method of claim 6, further comprising a step for applying the antimicrobial material to the fluid channel, wherein a fluid passing through the fluid channel contacts the antimicrobial material.

8. The method of claim 6, wherein the antimicrobial material comprises at least one of a cured coating, a lubricant, a soluble coating, and an insoluble coating.

9. The method of claim 6, wherein at each point of rotation for the shaft within the inner lumen, the upstream, downstream and middle ports are in contact with the antimicrobial material in at least one of the fluid channels and the antimicrobial groove.

10 The device of claim 6, wherein the fluid channel defines a fluid pathway between the shaft and the inner surface of the housing, and wherein the inner surface of the housing is interposed between at least two ports.

11. A stopcock medical connector device, comprising:

a housing having proximal opening, a distal end, and an inner lumen extending therebetween, the housing further comprising:

an upstream port having a hollow interior in fluid communication with the inner lumen;

a downstream port and having a hollow interior in fluid communication with the inner lumen;

a middle port having a hollow interior in fluid communication with the inner lumen;

a tap rotatably seated in the inner lumen of the housing and comprising a shaft having an outer surface comprising:

a fluid channel formed on the outer surface of the shaft, the fluid channel providing a fluid pathway between the downstream and middle ports and not the upstream port when the tap is rotated to a first position; and

an antimicrobial groove formed in the outer surface of the shaft and positioned such that the antimicrobial groove is in fluid communication with the upstream port the tap is in the first position, the antimicrobial groove comprising an antimicrobial material in contact with a fluid within the upstream port when the tap is in the first position;

wherein the outer surface of tap prevents fluid communication between the downstream and upstream ports when the tap is rotated to the first position;

wherein when the tap is rotated to a second position, the fluid channel is in fluid communication with only one of the upstream port, the middle port, and the downstream port,

wherein when the tap is rotated to a third position, fluid travels between the upstream port and the middle port via the fluid channel and between the upstream port and the downstream port via the fluid channel, wherein when the tap is rotated to the third position, the antimicrobial groove is not in fluid communication with the upstream port, the middle port, or the downstream port.

12. The device of claim 11, further comprising an additional antimicrobial material applied to the fluid channel, wherein a fluid passing through the fluid channel contacts the antimicrobial material.

13. The device of claim 11, wherein the antimicrobial material comprises at least one of a cured coating, a lubricant, a soluble coating, and an insoluble coating.

14. The device of claim 11, wherein at each point of rotation for the shaft within the inner lumen, the upstream, downstream and middle ports are in contact with the antimicrobial material in at least one of the fluid channel and the antimicrobial groove.

15. The device of claim 11, wherein the fluid channel defines a fluid pathway between the shaft and an inner surface of the housing, and wherein the inner surface of the housing is interposed between at least two ports.