

WHAT IS CLAIMED IS:

1. A cap comprising:
a housing comprising:
a top wall;
5 an essentially cylindrical sidewall forming a first cavity; and
an open bottom formed by the cylindrical sidewall with an opening to the first cavity
within the housing for receiving a hub of a medical connector; and
a protrusion extending from the housing and positioned within the first cavity, the
protrusion having an inner surface and an outer surface, the inner surface of the
10 protrusion defining a second cavity,
an inner thread on the inner surface of the protrusion, the inner thread being
sufficient to interlock with a threaded fitting of a female medical connector,
and
an outer thread on the outer surface of the protrusion, the outer thread being
15 sufficient to interlock with a threaded fitting of a male medical connector;
a disinfection sponge configured within the second cavity; and
a pressure seal attached to the housing and disposed adjacent to a surface of the
disinfection sponge.
2. The cap of claim 1, wherein upon engagement of the cap with the medical connector,
20 the disinfection sponge contacts a lumen edge of the medical connector and the pressure seal
blocks a lumen of the medical connector thereby inhibiting disinfectant ingress into the lumen.
3. The cap of claim 2, wherein when the lumen of the medical connector is open to the
cap, the pressure seal enters the lumen to inhibit disinfectant ingress into the lumen.
4. The cap of claim 2, wherein when the medical connector comprises a septum in the
25 lumen, the pressure seal is positioned to avoid creating a fluid path through the septum.
5. The cap of claim 1, wherein the disinfection sponge comprises a slotted end; an
essentially cylindrical sponge sidewall defining a hollow and an open end; and a sponge end
wall.

6. The cap of claim 5, wherein the slotted end of the disinfection sponge comprises a slot that extends into opposing portions of the sponge sidewall.
7. The cap of claim 6, wherein the slot extends along opposing portions of the sponge sidewall to the open end.
- 5 8. The cap of claim 5, wherein the pressure seal is disposed in the hollow of the disinfection sponge.
9. The cap of claim 8, wherein in an uncompressed state, the pressure seal is disposed entirely in the hollow.
- 10 10. The cap of claim 5, wherein the sponge end wall is in direct contact with an interior surface of the top wall.
11. The cap of claim 1, wherein the pressure seal comprises an elongate member and an insert, wherein:
the elongate member extends from an interior surface of the top wall of the housing;
and
15 the insert comprises: a bottom wall, and an essentially cylindrical insert sidewall, the insert sidewall forming a chamber and a top edge of the insert sidewall defining an aperture; the insert slidably engaging with the elongate member.
12. The cap of claim 11, wherein an inside surface of the top edge slidably engages with the elongate member.
- 20 13. The cap of claim 11, wherein the elongate member comprises a shoulder section, a slanted section, and one or more sliding sections.
14. The cap of claim 11, wherein the insert comprises a plurality of prongs defined by portions of the insert sidewall and the top edge separated by slits.
15. The cap of claim 14, wherein faces of the prongs slidably engage with the elongate
25 member.
16. The cap of claim 11, wherein an outside geometry of the insert sidewall comprises a tapered surface effective to complement an inner surface of a lumen of the medical connector.

17. The cap of claim 11, wherein the insert comprises a polymeric material selected from the group consisting of polyethylene, polypropylene, thermoplastic elastomer (TPE), or combinations thereof.
18. The cap of claim 1, wherein the pressure seal comprises a flexible insert attached to an
5 interior surface of the top wall of the housing.
19. The cap of claim 18, wherein the flexible insert comprises an elastomeric polymeric material.
20. The cap of claim 18, wherein the flexible insert comprises a top wall, a bottom wall,
10 and an essentially cylindrical and porous insert sidewall extending between the top wall and the bottom wall.
21. The cap of the preceding claim, wherein the top wall of the flexible insert further comprises an extension that engages with an upper lip the protrusion.
22. The cap of one of claims 18 to 21, wherein the flexible insert is breathable.
23. A cap comprising:
15 a housing comprising:
a top wall;
an essentially cylindrical sidewall forming a first cavity; and
an open bottom formed by the cylindrical sidewall with an opening to the first cavity
within the housing for receiving a hub of a medical connector; and
20 a protrusion extending from the housing and positioned within the first cavity, the protrusion having an inner surface and an outer surface, the inner surface of the protrusion defining a second cavity,
an inner thread on the inner surface of the protrusion, the inner thread being
sufficient to interlock with a mating feature of the medical connector
25 comprising a female medical connector, and
an outer thread on the outer surface of the protrusion, the outer thread being
sufficient to interlock with a mating feature of the medical connector
comprising a male medical connector;

- a disinfection sponge configured within the second cavity, the disinfection sponge comprising a slotted end; an essentially cylindrical sponge sidewall defining a hollow and an open end; and a sponge end wall; and
- a pressure seal disposed in the hollow of the disinfection sponge, the pressure seal comprising:
- an elongate member extending from an interior surface of the top wall of the housing; and
- an insert comprising a bottom wall, and an essentially cylindrical insert sidewall, the insert sidewall forming a chamber and a top edge of the insert sidewall defining an aperture; the insert slidably engaging with the elongate member;
- wherein upon engagement of the cap with the medical connector, the disinfection sponge contacts a lumen edge of the medical connector and the insert of the pressure seal blocks a lumen of the medical connector thereby inhibiting disinfectant ingress into the lumen.
24. The cap of claim 23, wherein an inside surface of the top edge slidably engages with the elongate member.
25. The cap of claim 23, wherein the elongate member comprises a shoulder section, a slanted section, and one or more sliding sections.
26. The cap of claim 23, wherein the insert sidewall comprises a plurality of prongs defined by portions of the insert sidewall and the top edge separated by slits.
27. The cap of claim 26, wherein faces of the prongs slidably engage with the elongate member.
28. The cap of claim 23, wherein an outside geometry of the insert sidewall comprises a tapered surface effective to compliment an inner surface of a lumen of the medical connector.
29. The cap of claim 23, wherein the insert comprises a polymeric material selected from the group consisting of polyethylene, polypropylene, thermoplastic elastomer (TPE), or combinations thereof.
30. A cap comprising:
- a housing comprising:

- a top wall;
an essentially cylindrical sidewall forming a first cavity; and
an open bottom formed by the cylindrical sidewall with an opening to the first cavity
within the housing for receiving a hub of a medical connector; and
- 5 a protrusion extending from the housing and positioned within the first cavity, the
protrusion having an inner surface and an outer surface, the inner surface of the
protrusion defining a second cavity,
an inner thread on the inner surface of the protrusion, the inner thread being
sufficient to interlock with a mating feature of the medical connector
10 comprising a female medical connector, and
an outer thread on the outer surface of the protrusion, the outer thread being
sufficient to interlock with a mating feature of the medical connector
comprising a male medical connector;
- a disinfection sponge configured within the second cavity, the disinfection sponge
15 comprising a slotted end; an essentially cylindrical sponge sidewall defining a
hollow and an open end; and a sponge end wall; and
a pressure seal disposed in the hollow of the disinfection sponge, the pressure seal
comprising: a flexible insert attached to an interior surface of the top wall of the
housing;
- 20 wherein upon engagement of the cap with the medical connector, the disinfection
sponge contacts a lumen edge of the medical connector and the pressure seal blocks
a lumen of the medical connector thereby inhibiting disinfectant ingress into the
lumen.
31. The cap of claim 30, wherein the flexible insert comprises an elastomeric polymeric
25 material.
32. The cap of claim 30, wherein the flexible insert comprises a top wall, a bottom wall,
and an essentially cylindrical and porous insert sidewall extending between the top wall and the
bottom wall.
33. The cap of the preceding claim, wherein the top wall of the flexible insert further
30 comprises an extension that engages with an upper lip the protrusion.

34. The cap of one of claims 30 to 33, wherein the flexible insert is breathable.
35. The cap of any preceding claim, wherein the medical connector is selected from a male Luer connector, a female Luer connector, and a needleless connector.
36. The cap of any preceding claim, wherein the disinfection sponge comprises a
5 disinfectant, an antimicrobial agent, or combinations thereof.
37. The cap of claim 36, wherein the disinfectant or the antimicrobial agent is selected from the group consisting essentially of: isopropyl alcohol, ethanol, 2-propanol, butanol, methylparaben, ethylparaben, propylparaben, propyl gallate, butylated hydroxyanisole (BHA), butylated hydroxytoluene, t-butyl-hydroquinone, chloroxylonol, chlorohexidine, chlorhexidine
10 diacetate, chlorohexidine gluconate, povidone iodine, alcohol, dichlorobenzyl alcohol, dehydroacetic acid, hexetidine, triclosan, hydrogen peroxide, colloidal silver, benzethonium chloride, benzalkonium chloride, octenidine, antibiotic, and mixtures thereof.
38. The cap of claim 37, wherein the disinfectant or antimicrobial agent comprises at least one of chlorhexidine gluconate and chlorhexidine diacetate.
- 15 39. The cap of any of claims 1 to 38, wherein the protrusion is integrally-formed with the housing.
40. The cap of any of claims 1 to 38, wherein the protrusion is attached to an interior surface of the top wall of the housing.
41. The cap of the preceding claim, wherein the protrusion is snap-fix or adhered to the
20 interior surface of the top wall of the housing.
42. The cap of the preceding claim, wherein the protrusion comprises an upper lip that engages with an elongate ring extending from an inner surface of the top wall of the housing.
43. A method of disinfecting a medical connector comprising:
connecting the cap of any preceding claim to a medical connector by engaging threads
25 of the medical connector onto the inner thread or the outer thread of the protrusion
such that an edge of the medical connector contacts the disinfection sponge and the
pressure seal inhibits disinfectant ingress into a lumen of the medical connector.

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44. A medical assembly comprising the cap of any of claims 1 to 42 connected to a medical connector.

45. The medical assembly of claim 44, wherein the medical connector is a female medical connector with a male threaded fitting selected from the group consisting of: a needleless
5 connector, a stopcock, a female Luer connector, and a catheter connector.

46. The medical assembly of claim 44, wherein the medical connector is a male medical connector with a female threaded fitting selected from the group consisting of: an intravenous tubing end and a male Luer connector.