We claim:

1. A disposable infusion circuit subassembly ~~(390)~~ for a system ~~(10)~~ that generates and infuses radiopharmaceuticals, the subassembly comprising:

an eluate line~~,~~ ~~(305),~~

a patient line~~,~~ ~~(305p),~~

a waste line~~,~~ ~~(305w) and~~

a valve member ~~(35WP) that~~ coupling~~es~~ the patient line and the waste line to the eluate line; and ~~the subassembly being characterized in that:~~

~~the subassembly further comprises~~ a support frame ~~(39) that~~ including~~es~~ a perimeter edge, the support frame~~and~~ holding~~s~~ together the valve member and a portion of the eluate line, a portion of the patient line and a portion of the waste line in approximately fixed relation with respect to the perimeter edge;

wherein the perimeter edge of the support frame is sized to fit within a compartment of a shielding assembly of the infusion system~~,~~ such that, when fitted within the compartment, the portion of the eluate line, held by the support frame, is positioned such that said portion of the eluate line passes over an eluate activity detector opening ~~(325) for an activity detector (25)~~ of the system, the opening being formed in a sidewall ~~(205)~~ that forms the compartment; and

an end of each of the eluate line ~~(405)~~, the patient line ~~(406)~~ and the waste line ~~(407)~~ extends out from the perimeter edge of the support frame.

2. The subassembly of claim 1, wherein:

the perimeter edge of the support frame includes a first side and a second side, the second side being opposite the first side;

the end of the eluate line extends out from the first side of the perimeter edge of the support frame; and

the ends of both the patient line and the waste line extend out from a second side of the perimeter edge.

32. The subassembly of claim 1, further comprising:

an eluant line ~~(304)~~; and ~~further characterized in that:~~

wherein the support frame further holds a portion of the eluant line in approximately fixed relation with respect to the perimeter edge of the support frame;

opposing ends of the eluant line ~~(404A, 404B)~~ extend out from the perimeter edge; and

the portion of the eluant line, held by the support frame, extends between the opposing ends of the eluant line.

43. The subassembly of claim 32, wherein:

the perimeter~~parameter~~ edge of the support frame includes a first side ~~(391)~~, a second side ~~(392)~~, opposite the first side, and a third side ~~(393)~~ extending between the first side and the second side; ~~and further characterized in that:~~

the end of the eluate line extends out from the first side of the perimeter edge of the support frame, and the ends of both the patient line and the waste line extend out from the second side of the perimeter edge;

a first of the opposing ends of the eluant line extends out from the third side of the perimeter edge; and

a second of the opposing ends of the eluant line extends out from the first side of the perimeter edge.

54. The subassembly of ~~any of~~ claims 1-~~3~~, further comprising:

a bypass line ~~(303)~~ coupled to the patient line; and ~~further characterized in that:~~

wherein the support frame further holds a portion of the bypass line, together with the valve member and the portions of the eluate line, the patient line and the waste line, in approximately fixed relation with respect to the perimeter edge of the support frame; and

an end of the bypass line ~~(403)~~ extends out from the perimeter edge.

6~~5~~. The subassembly of claim 5~~4~~, wherein:

the perimeter edge of the support frame includes a first side ~~(391)~~, a second side ~~(392)~~, opposite the first side, and a third side ~~(393)~~ extending between the first side and the second side; ~~and further characterized in that:~~

the end of the eluate line extends out from the first side of the perimeter edge of the support frame, and the ends of both the patient line and the waste line extend out from the second side of the perimeter edge; and

the end of the bypass line extends out from the third side of the perimeter edge.

7~~6~~. The subassembly of ~~any of~~ claim~~s~~ 1-~~3~~, wherein~~further characterized in that~~ the support frame exposes and orients the valve member for interlocking with a valve actuator receptacle ~~(253)~~ within the compartment of the shielding assembly.

8~~7~~. The subassembly of ~~any of~~ claim~~s~~ 1-~~3~~, wherein the support frame is formed from at least one thermoformed plastic sheet ~~(39A, 39B)~~.

~~8. The subassembly of any of claim 1-3, wherein the perimeter edge of the support frame includes a first side (391) and a second side (392), opposite the first side, and further characterized in that the end of the eluate line extends out from the first side of the perimeter edge of the support frame, and the ends of both the patient line and the waste line extend out from the second side of the perimeter edge.~~

~~9. A shielding assembly (200) for a system that generates and infuses radiopharmaceuticals, the shielding assembly comprising:~~

~~a sidewall (201, 203, 205) that defines a plurality of compartments and provides a radioactive radiation barrier for the compartments;~~

~~a first compartment of the plurality of compartments, the first compartment being defined by a first portion of the sidewall and being sized to contain a radioisotope generator (21) of the system;~~

~~a first passageway (215o) formed in an upper surface of the first portion of the sidewall and being sized to accommodate routing of an eluate line (305) from the generator;~~

~~a second compartment of the plurality of compartments, the second compartment being defined by a second portion (205) of the sidewall;~~

~~and a third compartment of the plurality of compartments, the third compartment being defined by a third portion (203) of the sidewall; and the shielding assembly being characterized in that:~~

~~the second compartment is sized to hold a portion of an infusion circuit (300) of the system and extends immediately adjacent to the first passageway, the portion of the infusion circuit being an extension of the eluate line from the generator and including a waste line (305w) and a patient line (305p);~~

~~the shielding assembly further comprises a second passageway (207) formed along the third portion of the sidewall;~~

~~the third portion of the sidewall extends upward relative to the second portion of the sidewall;~~

~~the third compartment is sized to accommodate a waste bottle (23) of the system and is located immediately adjacent to the second compartment, opposite the first passageway; and~~

~~the second passageway is sized to accommodate routing of at least one of the waste line and the patient line out from the second compartment.~~

~~10. The shielding assembly of claim 9, further characterized that the assembly further comprises:~~

~~a third passageway (251g) formed in an edge of the second compartment, the third passageway being sized to accommodate routing of an eluant line from an eluant source of the system into the second compartment; and~~

~~a fourth passageway (215i) formed in the upper surface of the first portion of the sidewall and extending alongside the first passageway, the fourth passageway being sized to accommodate routing of the eluant line out from the second compartment and into the first compartment, to the generator.~~

~~11. The shielding assembly of claim 9, further characterized in that the second passageway extends to an upper surface of the third portion of the sidewall, the upper surface of the third portion extending about a perimeter of an opening (233) into the third compartment.~~

~~12. The shielding assembly of claim 9, further characterized in that the assembly further comprises a retaining member (237) mounted within the second passageway to hold the at least one of the waste line and the patient line in place within the second passageway.~~