CLAIMS

1. Apparatus for brachytherapy, comprising:

a casing defining a hollow tube configured to carry one or more brachytherapy seeds in a manner allowing delivery of the seeds to a tumor, by pushing the brachytherapy seeds out of a distal end of the casing;

one or more brachytherapy seeds within the casing, for implanting in a patient, wherein the seeds are carrying atoms of a radioactive alpha emitting element for radiotherapy treatment; and

a viscous liquid within the casing, surrounding the one or more seeds, in a manner preventing daughter nuclei from the atoms on the one or more brachytherapy seeds from exiting the casing.

2. The apparatus of claim 1, wherein the casing comprises a needle.

3. The apparatus of claim 1, wherein the viscous liquid comprises glycerine.

4. The apparatus of claim 1, wherein the casing comprises a seed applicator including an elongate tube adapted for insertion into a patient and a stylet within the tube.

5. The apparatus of claim 4, wherein the casing comprises a hub at a proximal end of the elongate tube, wherein the hub has an empty chamber configured to collect excess viscous liquid from the elongate tube when the viscous liquid expands due to heat sterilization.

6. The apparatus of claim 5, wherein a distal end of the hub connecting to the elongate tube has a funnel shape configured to allow viscous liquid from the elongate tube entering the hub to return back to the elongate tube.

7. The apparatus of claim 1, wherein the casing comprises a seed capsule including a needle port on a first end and a piston carrying the one or more brachytherapy seeds on a second end, and wherein movement of the piston urges the one or more brachytherapy seeds into a needle in the needle port.

8. The apparatus of claim 7, wherein the needle port is configured to receive the needle in an orientation such that the one or more brachytherapy seeds enter the needle along with a portion of the viscous liquid.

9. The apparatus of any of claims 1-8, wherein each of the one or more brachytherapy seeds has a length of at least 0.2 centimeters.

10. The apparatus of any of claims 1-9, wherein each of the one or more brachytherapy seeds has a length of at least 0.5 centimeters.

11. The apparatus of any of claims 1-10, wherein each of the one or more brachytherapy seeds comprises a cylindrical tube having an outer diameter of at least 0.3 millimeters.

12. The apparatus of any of claims 1-11, wherein the one or more brachytherapy seeds comprise seeds formed of a conducting material.

13. The apparatus of claim 12, wherein the one or more brachytherapy seeds comprise stainless steel seeds.

14. The apparatus of any of claims 1-13, wherein the one or more brachytherapy seeds are configured to be removed from the patient after a treatment duration.

15. The apparatus of any of claims 1-8, wherein the viscous liquid can withstand sterilization at about 160 degrees Celsius.

16. A method of loading a needle with brachytherapy seeds, comprising:

grasping a needle, having a sharp tip for entering tissue, in a manner preventing movement of the needle;

bringing a brachytherapy seed of a length of at least 0.2 centimeters to a point adjacent the tip of the needle;

pushing the brachytherapy seed forward into the needle, through the sharp tip; and

loading a viscous liquid into the needle, through the sharp tip.

17. The method of claim 16, wherein pushing the brachytherapy seed forward comprises pushing a stylet, which pushes the seed forward into the needle.

18. A brachytherapy seed loading device, comprising:

a central chamber storing a brachytherapy seed carrying atoms of a radioactive alpha emitting element, wherein the seed has a length of at least 0.2 centimeters;

a needle port, configured to lock a needle in an orientation such that a sharp tip of the needle is aligned with the brachytherapy seed in the central chamber; and

a piston configured to push the brachytherapy seed into the needle locked in the needle port,

wherein the central chamber additionally stores a viscous liquid, which prevents Radon released by the brachytherapy seed from leaving the loading device.

19. The device of claim 18, wherein the needle port includes a screw which when fastened locks the needle in the needle port.

20. The device of claim 18, further comprising a piston screw which when rotated pushes the piston toward the central chamber.

21. A brachytherapy seed applicator, comprising:

a non-metallic elongated tube configured for insertion into tissue;

a hub at a proximal end of the tube;

one or more brachytherapy seeds carrying radioactive particles, within the tube; and

a stylet configured to be inserted into the tube and to push the one or more brachytherapy seeds to a distal end of the elongated tube.

22. The brachytherapy seed applicator of claim 21, wherein the one or more brachytherapy seeds carry alpha-emitting particles.

23. The brachytherapy seed applicator of claim 21, wherein one or more brachytherapy seeds carry Radium radionuclides.

24. The brachytherapy seed applicator of claim 21, wherein the non-metallic elongated tube allows viewing of the one or more brachytherapy seeds in an ultrasound image of the applicator.

25. The brachytherapy seed applicator of claim 21, wherein the non-metallic elongated tube prevents daughter nuclei of the radioactive particles from exiting the non-metallic elongated tube.

26. The brachytherapy seed applicator of claim 21, wherein the one or more brachytherapy seeds are distanced from a distal tip of the non-metallic elongated tube by at least one centimeter.

27. The brachytherapy seed applicator of claim 21, wherein the non-metallic elongated tube comprises Kapton.

28. The brachytherapy seed applicator of any of claims 21-27, wherein the one or more brachytherapy seeds have a length of at least 0.2 centimeters.