CLAIMS

1. An applicator for delivery of radiotherapy seeds to a tumor of a patient through an elongate needle, wherein the elongate needle comprises a needle handle and a needle tube having a given length for insertion into the patient, comprising:

an elongate applicator tube designed to pass through the elongate needle, wherein the elongate applicator tube defines an internal channel which receives one or more radiotherapy seeds;

an applicator handle configured to be attached to the needle handle; and

a stylet within the elongate applicator tube,

wherein the elongate applicator tube is longer than the elongate needle.

2. The applicator of claim 1, wherein the elongate applicator tube has a flexibility which is not suitable for insertion into a patient, but can pass through an inner channel of the elongate needle, when the elongate needle is in the patient.

3. The applicator of claim 1, wherein the elongate applicator tube has a length such that when the applicator handle is attached to the needle handle, a distal end of the elongate applicator tube is in close proximity to a distal end of the elongate needle.

4. The applicator of claim 1, wherein the elongate applicator tube has a length of at least 20 centimeters.

5. The applicator of any of claims 1-4, further comprising a seed dispensing unit configured to grasp the applicator handle and a handle of the stylet, in a manner which allows movement of the applicator handle relative to the stylet handle, such that the stylet pushes a seed out of the distal end of the elongate applicator tube.

6. The applicator of claim 5, wherein the seed dispensing unit comprises:

a casing configured to grasp the stylet handle; and

a slidable holder configured to couple with the applicator handle and slide relative to the casing.

7. The applicator of claim 6, wherein the seed dispensing unit comprises a guide handle which when moved, by a user, along an axis of the elongate applicator tube, moves the applicator handle relative to the stylet handle.

8. The applicator of claim 7, wherein the seed dispensing unit is configured to limit movement of the guide handle along the axis of the elongate applicator tube in a single stroke, to the length of a single seed.

9. The applicator of claim 8, wherein the seed dispensing unit is configured to require sideways movement of the guide handle, to allow further movement of the guide handle along the axis of the elongate applicator tube, after movement of the length of a single seed.

10. The applicator of claim 5, wherein the seed dispensing unit is configured to retract the applicator handle while the handle of the stylet is held in place.

11. The applicator of claim 10, wherein the elongate applicator tube has a length of at least 50 centimeters.

12. A seed dispensing unit, comprising:

an applicator handle holder configured to grasp a handle of an elongate applicator including a plurality of radiotherapy seeds at its distal end;

a stylet handle grasper configured to grasp a handle of a stylet in the elongate applicator; and

a casing configured to allow motion of the applicator handle holder relative to the stylet handle grasper, such that the stylet pushes a seed out of the distal end of the elongate applicator, wherein the casing is configured to limit uninterrupted motion of the applicator handle holder relative to the stylet handle grasper to the length of a single seed, such that further motion is allowed only after an adjustment action by a human user.

13. The seed dispensing unit of claim 12, wherein the applicator handle holder comprises a guide handle used by the user to move the applicator handle holder relative to the stylet handle grasper in a first direction, and wherein the casing requires movement in a second direction, different from the first direction, in order to move in the first direction beyond the length of a single seed.

14. The seed dispensing unit of claim 13, wherein the second direction is perpendicular to the first direction.

15. The seed dispensing unit of claim 12, wherein the applicator handle holder comprises a ratchet which prevents backward movement of the applicator handle holder after it is moved the length of a seed, unless a ratchet release button is pressed.

16. The seed dispensing unit of any of claims 12-15, wherein the casing comprises one or more ball plungers, which limit uninterrupted motion of the applicator handle holder relative to the stylet handle grasper to the length of a single seed.

17. A system for delivery of radiotherapy seeds to a tumor, comprising:

an endoscope defining an elongate channel;

an elongate needle which passes through the elongate channel of the endoscope;

an elongate applicator which passes through the elongate needle, and defines an internal channel which receives one or more radiotherapy seeds; and

a stylet within the elongate applicator.

18. The system according to claim 17, and comprising a seed dispensing unit configured to receive a handle of the needle on one end and a handle of the stylet on an opposite end.

19. The system according to claim 18, wherein the seed dispensing unit includes a needle handle holder configured to hold the needle handle and a proximal compartment which receives the handle of the stylet.

20. The system according to claim 19, wherein the seed dispensing unit is configured to push the needle handle holder towards the proximal compartment by fixed lengths, sufficient to dispense a single seed from the applicator.