Claims

1. An injectable sclerosant drug foam comprising:
   (i) a matrix comprising denatured blood;
   (ii) at least one fluid;
   (iii) at least one sclerosant drug;
   (iv) a medical gas or medical gas mixture acceptable for intravenous use,
   (v) wherein the denatured blood has been denatured by chemical means, heat, radiation, microwave, radiofrequency, infrared or other kinds of electromagnetic radiation.

2. The sclerosant drug foam according to claim 1, wherein the denatured blood is dispersed in a pharmaceutically acceptable liquid.

3. The sclerosant drug foam according to claim 2, wherein the pharmaceutically acceptable liquid is the sclerosant drug or the sclerosant drug is dissolved or dispersed in the pharmaceutically acceptable liquid.

4. The sclerosant drug foam according to any one of the claims 1 to 3, wherein the denatured blood is autologous blood of the respective patient.

5. The sclerosant drug foam according to any one of the claims 1 to 4, wherein the at least one sclerosant drug is selected from the group comprising sodium tetradecyl sulfate, ethanol, or polidocanol.

6. The sclerosant drug foam according to any one of the claims 2 to 5, wherein the dispersed denatured blood has a maximum solid particle size of 5 – 300 µm.

7. The sclerosant drug foam according to claim 6, wherein the dispersed denatured blood has a maximum solid particle size of 5 – 120 µm.

8. The sclerosant drug foam according to claim 7, wherein the dispersed denatured blood has a maximum solid particle size of 5 – 50 µm.

9. The sclerosant drug foam according to any one of the claims 1 to 8, wherein the foam has a bubble size of 10 – 300 µm.

10. The sclerosant drug foam according to claim 9, wherein the foam has a bubble size of 20 – 200 µm.

11. The sclerosant drug foam according to claim 10, wherein the foam has a bubble size of 30 – 120 µm.

12. A method for producing a sclerosant drug foam according to any one of the claims 1 to 11, comprising the steps of:
    (a) providing a matrix comprising denatured blood;
    (b) providing at least one pharmaceutically acceptable liquid and at least one sclerosant drug;
    (c) dispersing the matrix at a temperature of between 10°C and 77°C in the pharmaceutically acceptable liquid; and
    (d) foaming the dispersion with medical a gas suitable for intravenous use.

13. The method of claim 12, wherein the at least one pharmaceutically acceptable liquid comprises the said at least one sclerosant drug.

14. The method of claim 12 or 13, wherein the medical gas is selected from the group consisting of O_2, CO_2 and mixtures thereof.

15. A device for producing the injectable sclerosant drug foam according to any of the claims 1 to 11 comprising:
    (a) a catheter for blood sampling and foam distribution (1), and/or
    (b) a first container (4) for blood collection and denaturation, and/or
    (c) an external element for denaturation by heat, radiation or chemicals (6) to be physically or thermically connected to the first container, and/or
    (d) a second container (10) for at least one fluid and/or at least one sclerosant agent, and/or
    (e) a unit (7a) to apply mechanical force to the contents of the first and/or second container for mixing/dispersing, and/or
    (f) a chopping element (7b), and/or
    (g) a filter element (13), and/or
    (h) a third container to hold the dispersion (14), and/or
    (i) a fourth container containing a medical gas (18), and/or

(j) a unit (16) to apply mechanical force to the contents of the third or fourth container for foaming, and/or

(k) two-way switches, one-way valves, single stop cocks or combinations thereof (2, 3, 9, 15, 17), and/or

(l) auxiliary access to the device, e.g. to apply negative or positive pressure, or to supply fluids or gases (4a, 8, 11a, 11b, 19), and/or

(m) connection elements connecting all modular parts.

16. A kit for the production of the injectable sclerosant drug foam according to any of the claims 1 to 11 comprising:

    (a) a unit for blood denaturing and dispersing;

    (b) optionally at least one fluid;

    (c) optionally at least one sclerosant drug;

    (d) at least one medical gas; and

    (e) optionally one or several catheters for venous access and foam deployment.

17. Use of a sclerosant drug foam according to any one of claims 1-11 in the manufacture of a medicament for the treatment of venous insufficiency, wherein the medicament is to be injected into one or several target veins via the use of canulas, microcatheters or catheters prior to the subsequent removal of the said canulas, microcatheters or catheters.

18. The use of claim 17, wherein the medicament is to be injected into the largest target vein.

19. The use of claim 17 or claim 18, wherein the sclerosant drug foam is to be injected into the one or several target veins using ultrasound monitoring.