CLAIMS

1. A system for connecting a first body cavity and a second body cavity within the body of a patient, the system comprising:

(a) a first source device suitable for location in a first body cavity, the first source device comprising at least one signal electrode for generating an asymmetric electric field;

(b) a second device suitable for location in a second body cavity adjacent to the first body cavity, the second device comprising at least one detector for detecting the asymmetric electric field; and

(c) connection apparatus for connecting the first body cavity and the second body cavity;

in which in use, the connection between the first body cavity and the second body cavity is directed by aligning the first source device with the second device via the asymmetric electric field generated by the at least one signal electrode being detected by the second device, and delivering the connection apparatus along the direction indicated by the alignment.

2. A system according to Claim 1, in which the connection apparatus comprises the first source device.

3. A system according to Claim 2, in which the at least one signal electrode is located on the connection apparatus.

4. A system according to Claim 1, in which either the first source device or the second device comprise the connection apparatus.

5. A system according to Claim 1 or 4, in which the first source device and/or the second device comprise catheters.

6. A system according to Claim 1, 4 or 5 in which the first source device and/or the second device comprise guide wires.

7. A system according to Claim 1 or 4 to 6, in which the first source device comprises the connection apparatus.

8. A system according to any preceding claim, in which the first source device further comprises:

(i) an elongate outer sheath with a distal end and a proximal end, the outer sheath defining and enclosing an interior lumen;

(ii) the at least one signal electrode located at the distal end of the outer sheath; and

(iii) the connection apparatus being movable between a retracted position within the lumen at the distal end of the outer sheath of the first source device, and a deployed position extending outside of the outer sheath of the first source device;

and in which the second device further comprises:

(i) an elongate outer sheath with a distal end and a proximal end, the outer sheath defining and enclosing an interior lumen; and

(ii) the detector located at the distal end of the outer sheath.

9. A system according to any preceding claim, in which the system further comprises an electronic alignment monitor unit that is in communication with the first source device and the second device that is capable of generating the asymmetric electric field in the first source device, and receive the detected signal in the second device, and provide a visual or audible display to indicate alignment to the user.

10. A system according to Claim 9 in which, the electronic alignment monitor unit is comprised within a handle that connects to the first source device via rotational connectors (commutators).

11. A system according to any preceding claim, in which the system is for the formation of an arterio-venous fistula to provide vascular access for dialysis.

12. A system according to Claim 11 in which, the arterio-venous fistula is a radial cephalic fistula, a brachial cephalic fistula, a brachial basilic fistula or a basilic basilic fistula.

13. A system according to any of Claims 1 to 7, in which the first source device comprises an elongate body having distal and proximal ends, the body comprising a hollow sheath, which sheath defines a lumen that extends along at least a substantial portion of the body, in which the at least one signal electrode is located within the distal end of the elongate body,

and in which the connection apparatus comprises a penetrating member that is housed slideably within the lumen and is capable of extension out of the distal end of the elongate body; in which the direction of extension of the penetrating member is aligned with the asymmetrical electric field.

14. A system according to Claim 13, in which the elongate body comprises an aperture in the side wall in or near to the distal end, thereby allowing extension of the penetrating member in a direction that is substantially radial relative to the longitudinal axis of the elongate body.

15. A system according to Claim 13 or 14, in which the at least one signal electrode comprises at least two signal electrodes and is capable of generating an electric field.

16. A system according to Claim 13 or 14, in which the at least one signal electrode comprises at least four signal electrodes.

17. A system according to any of Claims 13 to 16, in which the at least one signal electrode is positioned distally on the elongate body relative to position of the aperture.

18. A system according to any of Claims 13 to 17, in which the at least one signal electrode is switchable to produce fields of varying angular dependence.

19. A system according to Claim 18 in which, the at least one signal electrode is switchable to produce dipole and quadrupole fields.

20. A system according to Claim 18 or 19 in which, signals from transmitted fields of varying angular dependence are combined using an algorithm to produce a composite signal with enhanced angular dependence.

21. A system according to any of Claims 13 to 20, in which the penetrating member has a proximal end and a distal end, in which at least one further signal electrode is located at or near the distal end of the penetrating member.

22. A system according to any of Claims 13 to 21, further comprising one or more ring electrodes positioned proximal and/or distal to the at least one signal electrode to permit longitudinal alignment of the system.

23. A system according to any of Claims 13 to 22, in which the penetrating member comprises a hollow needle.

24. A system according to Claim 23, in which the hollow needle is formed of shape memory alloy.

25. A system according to Claim 24 in which, the hollow needle is heated so that it bends as part of its deployment.

26 A system according to Claim 23 in which the hollow needle is formed of one or more sections arranged concentrically within the inner lumen in a telescopic manner.

27. A system according to any of Claims 1 to 7, in which the connection apparatus comprises a penetrating member, the penetrating member having a proximal and a distal end, in which at or near the distal end of the penetrating member is located the at least one signal electrode; in which the direction of extension of the penetrating member is aligned with the asymmetrical electric field.

28. A system according to any of Claims 13, 14 or 27, in which the at least one signal electrode comprises at least two signal electrodes.

29. A system according to any of Claims 13, 14 or 27, in which the at least one signal electrode comprises at least four signal electrodes.

30. A system according to any of Claims 13, 14 or 27, in which the penetrating member comprises a hollow needle.

31. A system according to Claim 30, in which the hollow needle is formed of shape memory alloy.