[0005] A need therefore exists to provide a needle guide that can address at least one of the above problems.

SUMMARY

[0006] An aspect of the present invention provides a needle guide assembly comprising a needle guide body comprising at least two separable portions; and a controller communicatively coupled to the needle guide body; wherein the needle guide body is operable by the controller to actuate between a closed configuration and an open configuration, wherein in the closed configuration, the at least two portions combine to define a channel therethrough for receiving a needle, and wherein in the open configuration, the at least two portions separate to release the received needle from the channel; wherein the channel comprises a proximal end and a distal end, and wherein the needle is configured to be received at the proximal end and inserted through the channel toward the distal end; wherein an axis of the channel is aligned in use with a needle insertion site adjacent the distal end, and wherein the needle guide body is pivotable about the distal end; and wherein the needle guide body is movable laterally to a next needle insertion site.

[0007]

[0008]

[0009] The needle guide body may be movable to a next needle insertion site based on at least one parameter determined by the controller. The at least one parameter may comprise at least one of relative positions between consecutive needle insertion sites and needle diameter.

[0010] The assembly may further comprise an articulated arm mechanically connected to the needle guide body and communicatively coupled to the controller, for displacing the needle guide body based on instructions from the controller.

[0011] The at least two portions may be configured to move angularly relative to each other between the open and closed configurations. Alternatively or in addition, the at least two portions may be configured to move translationally relative to each other between the open and closed configurations.

[0012] Another aspect of the present invention provides an automated method of operating a needle guide assembly, the method comprising identifying a needle insertion site; moving a needle guide body of the needle guide assembly to the needle insertion site, the needle guide body comprising at least two separable portions operable between an open configuration and closed configuration; actuating the at least two portions to the closed configuration, the at least two portions defining a channel therethrough in the closed configuration; aligning an axis of the channel with the needle insertion site such that the axis has a predetermined angular orientation by pivoting the needle guide body about a distal end of the channel; upon completion of needle insertion, actuating the at least two portions to the open configuration; and moving the needle guide body laterally to a next needle insertion site.

[0013]

[0014] Moving the needle guide body to the next needle insertion site may comprise controlling the needle guide body based on at least one parameter of relative positions between consecutive needle insertion sites and needle diameter.

[0015] Actuating the at least two portions may comprise moving the at least two portions angularly relative to each other. Alternatively or in addition, actuating the at least two portions may comprise moving the at least two portions translationally relative to each other.

[0016] Displacement of the needle guide body may be effected using an articulated arm.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[0018] Figure 1 shows a schematic diagram illustrating a needle guide body of a needle guide assembly according to an example embodiment.

CLAIMS

1. A needle guide assembly comprising:

a needle guide body comprising at least two separable portions; and

a controller communicatively coupled to the needle guide body;

wherein the needle guide body is operable by the controller to actuate between a closed configuration and an open configuration, wherein in the closed configuration, the at least two portions combine to define a channel therethrough for receiving a needle, and wherein in the open configuration, the at least two portions separate to release the received needle from the channel;

wherein the channel comprises a proximal end and a distal end, and wherein the needle is configured to be received at the proximal end and inserted through the channel toward the distal end;

wherein an axis of the channel is aligned in use with a needle insertion site adjacent the distal end, and wherein the needle guide body is pivotable about the distal end; and

wherein the needle guide body is movable laterally to a next needle insertion site.

2. The assembly as claimed in claim 1, wherein the needle guide body is movable to the next needle insertion site based on at least one parameter determined by the controller.

3. The assembly as claimed in claim 2, wherein the at least one parameter comprises at least one of relative positions between consecutive needle insertion sites and needle diameter.

4. The assembly as claimed in any one of the preceding claims, wherein the controller is configured to move the needle guide body between the needle insertion sites based on a sequence that minimises movement.

5. The assembly as claimed in any one of claims 1 to 3, wherein the controller is configured to move the needle guide body between the needle insertion sites based on a sequence that avoids collision.

6. The assembly as claimed in any one of the preceding claims, further comprising an articulated arm mechanically connected to the needle guide body and communicatively coupled to the controller, for moving the needle guide body based on instructions from the controller.

7. The assembly as claimed in any one of the preceding claims, wherein the at least two portions are configured to move angularly relative to each other between the open and closed configurations.

8. The assembly as claimed in any one of the preceding claims, wherein the at least two portions are configured to move translationally relative to each other between the open and closed configurations.

9. An automated method of operating a needle guide assembly, the method comprising:

identifying a needle insertion site;

moving a needle guide body of the needle guide assembly to the needle insertion site, the needle guide body comprising at least two separable portions operable between an open configuration and closed configuration;

actuating the at least two portions to the closed configuration, the at least two portions defining a channel therethrough in the closed configuration;

aligning an axis of the channel with the needle insertion site such that the axis has a predetermined angular orientation by pivoting the needle guide body about a distal end of the channel;

upon completion of needle insertion, actuating the at least two portions to the open configuration; and

moving the needle guide body laterally to a next needle insertion site.

10. The method as claimed in claim 9, wherein moving the needle guide body laterally to the next needle insertion site comprises controlling the needle guide body based on at least one parameter of relative positions between consecutive needle insertion sites and needle diameter.

11. The method as claimed in claim 9 or 10, wherein moving the needle guide body laterally to the next needle insertion site comprises moving based on a sequence that minimises movement.

12. The method as claimed in claim 9 or 10, wherein moving the needle guide body laterally to the next needle insertion site comprises moving based on a sequence that avoids collision.

13. The method as claimed in any one of claims 9 to 12, wherein actuating the at least two portions comprises moving the at least two portions angularly relative to each other.

14. The method as claimed in any one of claims 9 to 13, wherein actuating the at least two portions comprises moving the at least two portions translationally relative to each other.

15. The method as claimed in any one of claims 9 to 14, wherein moving the needle guide body to the next needle insertion site comprises actuating an articulated arm.