of the medicament inside the drug delivery device may need to be raised prior to injection. While passive warming of the medication is possible, it may be desirable to hasten this process so that the user to not have to wait a significant period of time to deliver the drug. Also, onboard electronics of the drug delivery device may need to be awakened from a low-energy state to a high-energy state prior to drug delivery.

[0006] As set forth in more detail below, the present disclosure sets forth an drug delivery system embodying advantageous alternatives to existing drug delivery devices and that may address one or more of the challenges or needs mentioned above.

Summary

[0006a] According to an aspect of the present invention, there is provided a drug delivery device comprising:

a reservoir;

a delivery member having a proximal end connected or configured to be connected in fluid communication with the reservoir and a distal end configured for insertion into a patient;

a housing having an opening, the distal end of the delivery member being configured to extend through the opening in an operative state;

an adhesive for removably coupling the housing to skin of the patient;

a removable cover covering at least a portion of the adhesive;

a controllable element; and

a patient contact sensor,

wherein the drug delivery device is programmed or configured to:

(a) determine if the at least a portion of the adhesive has been exposed, and

(b) determine if the drug delivery device is in contact with the patient, then, if the drug delivery device is in contact with the patient, output a control signal to the controllable element.

[0007] There is disclosed a drug delivery system includes a drug delivery device comprising a reservoir, a delivery cannula having a proximal end in fluid communication with the reservoir and a distal end to be received within a patient, and a controllable element. The drug delivery system also includes a sensor coupled to the drug delivery device and a controller coupled to the sensor as well as the controllable element. The

controller may be configured to: use the sensor to determine a condition or an operational state of the drug delivery device, and control the controllable element based on the condition or operational state of the drug delivery device.

[0008] There is disclosed a drug delivery system includes a drug delivery device comprising a reservoir, a delivery cannula having a proximal end in fluid communication with the reservoir and a distal end to be received within a patient, and a controllable element. The drug delivery system also includes a memory configured to store identity information representative of at least one of an identity of the patient, an identity of the drug delivery device, or an identity of a medicament to be stored within the reservoir. Additionally, the drug delivery system includes a controller coupled to the memory and the controllable element. The controller may be configured to control the controllable element based on the identity information.

[0009] There is disclosed a method is provided of using a drug delivery device comprising a reservoir, a delivery cannula having a proximal end in fluid communication with the reservoir and a distal end to be received within a patient, a removable sterile barrier disposed about the second end of the delivery cannula, and a controllable element.

What is claimed is:

[Claim 1]

A drug delivery device comprising:

a reservoir;

a delivery member having a proximal end connected or configured to be connected in fluid communication with the reservoir and a distal end configured for insertion into a patient;

a housing having an opening, the distal end of the delivery member being configured to extend through the opening in an operative state;

an adhesive for removably coupling the housing to skin of the patient;

a removable cover covering at least a portion of the adhesive;

a controllable element; and

a patient contact sensor,

wherein the drug delivery device is programmed or configured to:

(a) determine if the at least a portion of the adhesive has been exposed, and

(b) determine if the drug delivery device is in contact with the patient, then, if the drug delivery device is in contact with the patient, output a control signal to the controllable element.

[Claim 2]

The drug delivery device of claim 1, wherein the opening is formed in an exterior surface of the housing and the adhesive is disposed at the exterior surface of the housing.

[Claim 3]

The drug delivery device of claim 1, wherein the removable cover comprises a sheet covering the adhesive and configured for removal by the patient or a user to expose the adhesive.

[Claim 4]

The drug delivery device of claim 1, wherein the drug delivery device comprises a controller, the controller being programmed to output the control signal to the controllable element if (b) does not occur within a predefined time period after (a).

[Claim 5]
The drug delivery device of claim 1, wherein the drug delivery device comprises a controller, the controller being programmed to repetitively determine at predefined time intervals if the drug delivery device is in contact with the patient.

[Claim 6]
The drug delivery device of claim 1, wherein the controllable element comprises a communication unit.

[Claim 7]
The drug delivery device of claim 6, wherein the communication unit, in response to the control signal, wirelessly transmits a report to an external computing device.

[Claim 8]
The drug delivery device of claim 6, wherein the drug delivery device comprises a controller, the controller being programmed to determine (a) if drug delivery is complete, and (b) if the drug delivery device has been removed from contact with the patient, then, if (a) and (b) are determined to exist, control the communication unit to transmit a report.

[Claim 9]
The drug delivery device of claim 1, wherein the controllable element comprises a lock.

[Claim 10]
The drug delivery device of claim 9, wherein the control signal changes the lock from a locked state to an unlocked state.

[Claim 11]
The drug delivery device of claim 10, comprising a plunger configured to expel a drug from the reservoir, wherein the lock, in the locked state, prevents movement of the plunger.

[Claim 12]
The drug delivery device of claim 10, comprising a trigger button operable by the patient, wherein the lock, in the locked state, prevents operation of the trigger button by the patient.

[Claim 13]
The drug delivery device of claim 1, wherein the controllable element comprises a circuit having a low-energy state and a high-energy state, and wherein the control signal switches the circuit from the low-energy state to the high-energy state.

[Claim 14]
The drug delivery device of claim 1, wherein the controllable element comprises a heating element configured to heat a drug in the reservoir or the delivery member in response to the control signal.

[Claim 15]
The drug delivery device of claim 1, wherein the patient contact sensor comprises at least one of a capacitance sensor, a resistance sensor, and an inductance sensor.