

Summary

[0005] According to an aspect of the disclosure, a method for assisting a user of a drug delivery with an application executing on a mobile computing device is provided. The mobile computing device may include a processor and a memory. The method may involve: (a) receiving, at the processor of the mobile computing device, information from the drug delivery device; (b) causing the processor of the mobile computing device to analyze the information from the drug delivery device according to information stored in the memory of the mobile computing device to determine at least one of a condition of the drug delivery device, a condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or the patient, or an identity of a medicament contained in the drug delivery device; (c) causing the processor of the mobile computing device to select at least one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or patient, or the identity of the medicament contained in the drug delivery device; and (d) causing the processor of the mobile computing device to generate a display in the application including the at least one of the informational prompt or the instructional prompt.

[0006] According to another aspect of the disclosure, a mobile computing device for assisting a user of a drug delivery device with an application executing on the mobile computing device is provided. The drug delivery device may include a communication unit configured to receive information from the drug delivery device, a processor, and a memory coupled to the processor. The memory may be configured to store non-transitory computer-executable instructions that, when executed by the processor, cause the processor to: (a) in response to receiving the information from the drug delivery device, determine at least one of a condition of the drug delivery device, a condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or a patient, or an identity of a medicament contained in the drug delivery device; (b) select at least

one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or the patient, or the identity of the medicament contained in the drug delivery device; and (c) generate, in the application executing on the mobile computing device, a display including the at least one of the informational prompt or the instructional prompt.

[0007] According to yet another aspect of the disclosure, provided is a non-transitory, computer-readable storage medium having computer-executable instructions to be executed on a processor of a mobile computing device for providing an application operable to assist a user of a drug delivery device. The computer-executable instructions may include instructions for: (a) receiving at the mobile computing device information from the drug delivery device; (b) causing the processor to, in response to receiving the information from the drug delivery device, determine at least one of a condition of the drug delivery device, a condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or a patient, or an identity of a medicament contained in the drug delivery device; (c) causing the processor to select at least one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or the patient, or the identity of the medicament contained in the drug delivery device; and (d) causing the processor to generate a display in the application including the at least one of the informational prompt or the instructional prompt.

What is claimed is:

1. A method for assisting a user of a drug delivery device with an application executing on a mobile computing device, the mobile computing device including a processor and a memory, the method comprising:

receiving, at the processor of the mobile computing device, information from the drug delivery device;

causing the processor of the mobile computing device to analyze the information from the drug delivery device according to information stored in the memory of the mobile computing device to determine at least one of a condition of the drug delivery device, a condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or the patient, or an identity of a medicament contained in the drug delivery device;

causing the processor of the mobile computing device to select at least one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or patient, or the identity of the medicament contained in the drug delivery device; and

causing the processor of the mobile computing device to generate a display in the application including the at least one of the informational prompt or the instructional prompt.

2. The method of claim 1, comprising storing the at least one of the informational prompt or the instructional prompt in the memory of the mobile computing device prior to receiving, at the processor of the mobile computing device, the information from the drug delivery device.

3. The method of claim 1, comprising causing the processor of the mobile computing device to transmit, over a network, the information received from the drug delivery device to an external computing device.

4. The method of claim 3, wherein the selecting of the at least one of the informational prompt or the instructional prompt comprises causing the external computing device to select the at least one of the informational prompt or the instructional prompt based on the information from the drug delivery device.

5. The method of any one of the preceding claims, the mobile computing device comprising at least one of a smartphone, a smartwatch, a smart wearable device, a personal computer, a laptop computer, or a tablet computer.

6. The method of any one of the preceding claims, wherein causing the mobile computing device to generate the display in the application comprises displaying an instructional prompt instructing the user to dispose the drug delivery device on or against a skin of a patient.

7. The method of any one of the preceding claims, comprising:
determining if the drug delivery device has an acceptable temperature or an acceptable temperature history based on the information from the drug delivery device; and
wherein selecting the at least one of the informational prompt or the instructional prompt comprises selecting an instructional prompt instructing the user to at least dispose the drug delivery device on or against a skin of a patient in response to a determination that the drug delivery device has an acceptable temperature or an acceptable temperature history.

8. The method of any one of the preceding claims, wherein causing the mobile computing device to generate the display in the application comprises displaying

an instructional prompt instructing the user to correctly orient the drug delivery device relative to a skin of a patient.

9. The method of any one of the preceding claims, comprising:
determining if the drug delivery device is disposed on or against a skin of a patient based on the information from the drug delivery device;
wherein selecting the at least one of the informational prompt or the instructional prompt comprises selecting an instructional prompt instructing the user to correctly orient the drug delivery device relative to the skin of the patient in response to a determination that the drug delivery device is disposed on or against the skin of the patient.

10. The method of any one of the preceding claims, wherein causing the mobile computing device to generate the display in the application comprises displaying an instructional prompt instructing the user to actuate the drug delivery device.

11. The method of any one of the preceding claims, comprising:
determining if an orientation of the drug delivery device relative to a skin of a patient is acceptable based on the information from the drug delivery device; and
wherein selecting the at least one of the informational prompt or the instructional prompt comprises selecting an instructional prompt instructing the user to actuate the drug delivery device in response to a determination that the orientation of the drug delivery device is acceptable.

12. The method of any one of the preceding claims, wherein causing the mobile computing device to generate the display in the application comprises displaying an instructional prompt instructing the user to wait for completion of a delivery of a medicament from the drug delivery device to a patient.

13. The method of any one of the preceding claims, comprising:
determining if the drug delivery device has been actuated by the user based on the information from the drug delivery device; and

wherein selecting the at least one of the informational prompt or the instructional prompt comprises selecting an instructional prompt instructing the user to wait for completion of a delivery of a medicament from the drug delivery device to a patient in response to a determination that the drug delivery device has been actuated by the user.

14. The method of any one of the preceding claims, wherein causing the mobile computing device to generate the display in the application comprises displaying an instructional prompt instructing the user to discard the drug delivery device.

15. The method of any one of the preceding claims, comprising:
determining if a delivery of a medicament from the drug delivery device to a patient has been completed based on the information from the drug delivery device; and
wherein selecting the at least one of the informational prompt or the instructional prompt comprises selecting an instructional prompt instructing the user to discard the drug delivery device in response to a determination that delivery of the medicament from the drug delivery device to the patient has been completed.

16. The method of any one of the preceding claims, comprising, in response to the determination that delivery of the medicament from the drug delivery device to the patient has been completed, causing the processor of the mobile computing device to transmit, via a communication network to one or more remote computing devices, a report indicative of the completion of drug delivery.

17. A mobile computing device for assisting a user of a drug delivery device with an application executing on the mobile computing device, the mobile computing device comprising:

a communication unit configured to receive information from the drug delivery device;

a processor; and

a memory coupled to the processor and configured to store non-transitory, computer-executable instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine at least one of a condition of the drug delivery device, a condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or a patient, or an identity of a medicament contained in the drug delivery device;

select at least one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or the patient, or the identity of the medicament contained in the drug delivery device; and

generate, in the application executing on the mobile computing device, a display including the at least one of the informational prompt or the instructional prompt.

18. The mobile computing device of claim 17, the communication unit, the processor, and the memory being included in at least one of a smartphone, a smartwatch, a smart wearable device, a personal computer, a laptop computer, or a tablet computer.

19. The mobile computing device of claim 17 or 18, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine if the drug delivery device has an acceptable temperature or an acceptable temperature history based on the information from the drug delivery device, and

select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to at least dispose the drug delivery device on or against a skin of a patient in response to a determination

that the drug delivery device has an acceptable temperature or an acceptable temperature history.

20. The mobile computing device of any one of claims 17 to 19, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine if the drug delivery device is disposed on or against a skin of a patient based on the information from the drug delivery device, and

select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to correctly orient the drug delivery device relative to the skin of the patient in response to a determination that the drug delivery device is disposed on or against the skin of the patient.

21. The mobile computing device of any one of claims 17 to 20, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine if an orientation of the drug delivery device relative to a skin of a patient is acceptable based on the information from the drug delivery device, and

select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to actuate the drug delivery device in response to a determination that the orientation of the drug delivery device is acceptable.

22. The mobile computing device of any one of claims 17 to 21, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine if the drug delivery device has been actuated by the user based on the information from the drug delivery device, and

select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to wait for completion of a delivery of a medicament from the drug delivery device to a patient in response to a determination that the drug delivery device has been actuated by the user.

23. The mobile computing device of any one of claims 17 to 22, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to:

in response to receiving the information from the drug delivery device, determine if a delivery of a medicament from the drug delivery device to a patient has been completed based on the information from the drug delivery, and

select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to discard the drug delivery device in response to a determination that delivery of the medicament from the drug delivery device to a patient has been completed.

24. The mobile computing device of any one of claims 17 to 23, wherein the non-transitory, computer-executable instructions include instructions that, when executed by the processor, cause the processor to control the communication unit to transmit, via a communication network to one or more remote computing devices, a report indicative of completion of drug delivery to the patient in response to the determination that delivery of the medicament from the drug delivery device to the patient has been completed.

25. A non-transitory, computer-readable storage medium having computer-executable instructions to be executed on a processor of a mobile computing device for providing an application operable to assist a user of a drug delivery device, the computer-executable instructions comprising instructions for:

receiving, at the mobile computing device, information from the drug delivery device;

causing the processor to, in response to receiving the information from the drug delivery device, determine at least one of a condition of the drug delivery device, a

condition of a medicament contained in the drug delivery device, an operational state of the drug delivery device, an identity of the drug delivery device, an identity of the user or a patient, or an identity of a medicament contained in the drug delivery device;

causing the processor to select at least one of an informational prompt or an instructional prompt to be displayed to the user based on the determination of the at least one of the condition of the drug delivery device, the condition of the medicament contained in the drug delivery device, the operational state of the drug delivery device, the identity of the drug delivery device, the identity of the user or the patient, or the identity of the medicament contained in the drug delivery device; and

causing the processor to generate a display in the application including the at least one of the informational prompt or the instructional prompt.

26. The non-transitory, computer-readable storage medium of claim 25, the computer-executable instructions comprising instructions for:

causing the processor to, in response to receiving the information from the drug delivery device, determine if the drug delivery device has an acceptable temperature or an acceptable temperature history based on the information from the drug delivery device; and

causing the processor to select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to at least dispose the drug delivery device on or against a skin of a patient in response to a determination that the drug delivery device has an acceptable temperature or an acceptable temperature history.

27. The non-transitory, computer-readable storage medium of claim 25 or 26, the computer-executable instructions comprising instructions for:

causing the processor to, in response to receiving the information from the drug delivery device, determine if the drug delivery device is disposed on or against a skin of a patient based on the information from the drug delivery device; and

causing the processor to select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to correctly orient the drug delivery device relative to the skin of the patient in response to a

determination that the drug delivery device is disposed on or against the skin of the patient.

28. The non-transitory, computer-readable storage medium of any one of claims 25 to 27, the computer-executable instructions comprising instructions for:

causing the processor to, in response to receiving the information from the drug delivery device, determine if an orientation of the drug delivery device relative to a skin of a patient is acceptable based on the information from the drug delivery device; and

causing the processor to select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to actuate the drug delivery device in response to a determination that the orientation of the drug delivery device is acceptable.

29. The non-transitory, computer-readable storage medium of any one of claims 25 to 28, the computer-executable instructions comprising instructions for:

causing the processor to, in response to receiving the information from the drug delivery device, determine if the drug delivery device has been actuated by the user based on the information from the drug delivery device; and

causing the processor to select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to wait for completion of a delivery of a medicament from the drug delivery device to a patient in response to a determination that the drug delivery device has been actuated by the user.

30. The non-transitory, computer-readable storage medium of any one of claims 25 to 29, the computer-executable instructions comprising instructions for:

causing the processor to, in response to receiving the information from the drug delivery device, determine if a delivery of a medicament from the drug delivery device to a patient has been completed based on the information from the drug delivery; and

causing the processor to select an instructional prompt, corresponding to the at least one of the informational prompt or the instructional prompt, instructing the user to

discard the drug delivery device in response to a determination that delivery of the medicament from the drug delivery device to a patient has been completed.

31. The non-transitory, computer-readable storage medium of any one of claims 25 to 30, the computer-executable instructions comprising instructions for causing the processor to transmit, via a communication network to one or more remote computing devices, a report indicative of completion of drug delivery to the patient in response to the determination that delivery of the medicament from the drug delivery device to the patient has been completed.