Tandem t:slim Insulin Pump Use Cases

MAIN USE CASE: INSULIN PUMP FOR GLUCOSE MANAGEMENT

Actors: Diabetic patient, Insulin Pump, CGM (Continuous Glucose Monitor)

Preconditions:

- Insulin pump is sufficiently charged for proper use.
- 300-unit cartridge is filled with insulin
- CGM is connected and correctly transmitting real-time glucose readings to the insulin pump
- Diabetic patient's information is configured for their user profile

Postcondition:
Insulin is pumped into the patient accordingly (different based on glucose levels) and/or the CGM provides alerts as to how to manage glucose levels.

Main Success Scenario:

1. User powers on the insulin pump
2. Insulin starts the power on pin pad
3. User must insert the correct PIN to access the hub after turning on the pump
4. Insulin pump home screen displays battery level, IOB (Insulin on board), and CGM data
5. User manually delivers insulin based on current CGM readings and suggested dosage
    - If glucose level is above 10 mmol/L, bolus delivery is manually requested, and the amount is automatically calculated based on configured correction factors
    - If glucose level is below 3.9mmol/L, basal delivery is suspended

6. User is alerted via the insulin pump speaker and screen about high/low glucose levels, bolus amounts delivered, and errors

7. Pump continues monitoring unless manually powered off or an error occurs

Extensions:
2a. Insulin pump fails the Power on button

- 2a1. Pump alerts the user via home screen and speaker that the power on button failed

- 2a2. Pump alerts users to recharge, reconnect CGM, or contact support
  5a. User manually selects bolus option from insulin pump menu

- 5a1. User inputs or confirms calculated bolus dose (includes extended bolus if selected)

- 5a2. Insulin pump checks if amount is available and delivers bolus. Logs events are displayed depending on success or not

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SUB-USE CASE 1: POWER ON BUTTON

Actors: Diabetic patient, Insulin pump
Preconditions:

- User is present to turn on insulin pump

- State of insulin pump is turned off to begin with

Postcondition: Pump is ready for use.

Main Success Scenario:

1. User presses and holds the power button to turn on the pump

2. Pump performs diagnostic checks including battery, amount of insulin, CGM connectivity, and correct deployment of software

3. Home screen loads successfully displaying battery level, insulin reservoir status, and CGM connectivity

Extensions:
3a. Insulin pump fails power on button

- 3a1. Pump alerts users to recharge, reconnect CGM, or contact support

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SUB-USE CASE 2: INSULIN DELIVERY ADJUSTMENT

Actors: Diabetic patient, Insulin Pump, CGM
Preconditions:

- Pump is operating as expected
- CGM is transmitting real-time glucose data

Postcondition:
Insulin is delivered manually by the user based on glucose level

Main Success Scenario:

1. Pump receives glucose data from CGM
2. Pump displays current glucose trend and provides recommended bolus amount
3. User delivers insulin manually based on provided information

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SUB-USE CASE 3: MANUAL BOLUS DELIVERY (GLUCOSE > 10 mmol/L)

Actors: Diabetic patient, Insulin Pump
Preconditions:

- CGM data shows glucose is ≥ 10 mmol/L
- Correction factors are configured in user profile

Postcondition:
Manual correction bolus is delivered

Main Success Scenario:

1. Glucose reading reaches ≥ 10 mmol/L
2. Pump suggests a correction bolus based on profile settings
3. User manually confirms bolus delivery
4. Extended bolus option may be selected if needed

SUB-USE CASE 4: USER VIEWS INSULIN DELIVERY HISTORY

Actors: Diabetic patient, Insulin pump
Preconditions:

- Previous insulin injections have been correctly logged and stored in backend system

Postcondition:
User is able to clearly view the insulin history of their previous alerts/events

Main Success Scenario:

1. User navigates to History tab on insulin pump home screen
2. Screen displays past bolus and basal insulin injection delivery with relevant information
3. User can review past CGM-triggered alerts and/or readings

SUB-USE CASE 5: CONFIGURING USER PROFILE FOR DIABETIC PATIENT

Actors: Diabetic patient, Insulin pump
Preconditions:

- Pump passes the Power On Button

Postcondition:
User profile is successfully created, modified and/or deleted

Main Success Scenario:

1. User accesses the User Profile tab via the Insulin pump home screen

2. User creates a new profile by clicking Add and edits a profile by clicking on the profile

3. If user decides to edit a profile, they can modify insulin delivery settings (basal rate, carb ratios, correction factors, glucose targets)

4. If user decides to delete the profile, they click on the Delete button when editing a profile

5. User saves and activates the profile, or deletes if no longer needed

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SUB-USE CASE 6: INSULIN PUMP MALFUNCTION & ERROR HANDLING

Actors: Diabetic patient, Insulin Pump
Preconditions:

- Pump receives a malfunction and an error occurs with functionality

Postcondition:
Pump provides alerts and instructions to resolve the error

Main Success Scenario:

1. Insulin pump detects an error due to a hardware/software error (low battery, insulin occlusion, CGM disconnected)

2. Insulin pump alerts the user via home screen and insulin pump speaker that a malfunction has occurred

3. Pump provides explicit instructions to resolve malfunction. This includes recharging the battery, reconnecting the CGM, checking insulin cartridge and infusion set for proper insulin amount and/or contacting support

4. Malfunction of insulin pump will result in suspension in functionality until precautions have been taken