Use Case #1: Familiarize with Pump Interface

Primary Actors: Pump User

Stakeholders: Healthcare provider, Technical support

Preconditions:

• Pump is powered on, charged, and passed startup diagnostics.

Success Guarantee:

• Users successfully view essential status information clearly and accurately.

Main Success Scenario:

1. User views the home screen displaying battery level, insulin cartridge level, insulin-on-board (IOB), current glucose reading, and insulin delivery status.
2. User taps navigation buttons (“Bolus,” “Options”) to access additional pump functions.
3. User returns to the home screen quickly by tapping the Tandem logo from any other screen.

Extensions:

• 1a. Screen or Touch Interface Malfunction

• 1a1. System displays an error message and suggests troubleshooting or contacting technical support.

Use Case #2: Charging and Power Management

Primary Actors: Pump User

Stakeholders: Technical support

Preconditions:

• User has access to a USB power source.

Success Guarantee:

• Pump battery is effectively managed and fully operational.

Main Success Scenario:

1. User connects the pump to a power source using the USB cable.
2. Pump displays real-time battery charging progress.
3. User powers pump on/off by pressing and holding the power button or sets the screen to sleep through the options menu.

Extensions:

• 1a. Charging Failure

• 1a1. System alerts user via audio and on-screen message to check cable connection or power source.

• 3a. Pump fails to power on

• 3a1. Users are prompted to verify battery charge level or contact technical support.

Use Case #3: Manage Personal Insulin Delivery Profiles (CRUD)

Primary Actors: Pump User

Stakeholders: Healthcare provider

Preconditions:

• Pump is operational, user has appropriate permissions to modify profiles.

Success Guarantee:

• User creates, reads, updates, or deletes insulin delivery profiles accurately.

Main Success Scenario:

1. User navigates to the personal profiles section.
2. User creates a new insulin delivery profile by entering basal rates, carbohydrate ratios, correction factors, and glucose targets.
3. User activates the newly created profile.

Extensions:

• 2a. User edits existing profile

• 2a1. User selects the profile, modifies parameters, and saves changes.

• 2b. User deletes existing profile

• 2b1. User selects profile, confirms deletion, and system removes profile from available selections.

Use Case #4: Manual Bolus Administration

Primary Actors: Pump User

Stakeholders: Healthcare provider

Preconditions:

• Pump has an active insulin cartridge, bolus settings are configured.

Success Guarantee:

• Bolus insulin is delivered accurately per user's input or pump recommendations.

Main Success Scenario:

1. User accesses the bolus calculator from the home screen or "Bolus" button.
2. User inputs current blood glucose level and carbohydrate intake (manual or via CGM).
3. Pump calculates and displays recommended insulin dosage.
4. User confirms dosage or manually adjusts the amount.
5. Pump administers bolus insulin accordingly.

Extensions:

• 4a. User requests extended bolus

• 4a1. User selects the extended bolus option and configures duration and insulin distribution.

• 5a. User cancels bolus delivery mid-process

• 5a1. User presses cancel; pump immediately halts insulin delivery and confirms on-screen.

Use Case #5: Automatic Insulin Adjustment via Control-IQ Technology

Primary Actors: System (Control-IQ), Pump User

Stakeholders: Healthcare provider

Preconditions:

• Control-IQ technology is active, CGM is paired and operational.

Success Guarantee:

• System dynamically manages basal insulin based on glucose levels.

Main Success Scenario:

1. Control-IQ technology continuously monitors real-time glucose data.
2. System automatically adjusts basal insulin delivery to keep glucose within target range.

3. System alerts the user if glucose falls below threshold (3.9 mmol/L) and suspends insulin if needed.

Extensions:

• 3a. CGM disconnected

• 3a1. User receives audio and visual alerts to reconnect the CGM device immediately.

Use Case #6: Start, Stop, and Resume Insulin Delivery

Primary Actors: Pump User, System

Stakeholders: Healthcare provider

Preconditions:

• Pump has sufficient insulin; basal rate settings are configured.

Success Guarantee:

• User safely manages the basal insulin delivery process.

Main Success Scenario:

1. User selects basal insulin rate from active profile or configured manually.
2. System initiates continuous insulin delivery.
3. User or system stops insulin delivery manually or automatically (low glucose event).
4. User resumes insulin delivery after stable glucose level is detected.

Extensions:

• 3a. User unable to resume insulin delivery

• 3a1. System alerts users via audio and text messages to take action or contact support.

Use Case #7: Insulin Delivery History Tracking

Primary Actors: Pump User

Stakeholders: Healthcare provider

Preconditions:

• System logs insulin delivery and events automatically.

Success Guarantee:

• Users accurately review historical insulin delivery records and events.

Main Success Scenario:

1. User navigates to the pump's "Current Status" or "History" screen.
2. User selects specific events (basal rates, boluses, CGM alerts) to view detailed information.
3. System displays event details clearly.

Extensions:

• 2a. Data retrieval error

• 2a1. Users are prompted to retry or contact support for troubleshooting.

Use Case #8: Error and Malfunction Handling

Primary Actors: System, Pump User

Stakeholders: Technical support, Healthcare provider

Preconditions:

• Pump is active and continuously monitoring internal states.

Success Guarantee:

• Pump detects errors/malfunctions and guides users to appropriate actions.

Main Success Scenario:

1. System detects malfunction (low battery, occlusion, cartridge error).
2. System suspends insulin delivery immediately.
3. User receives clear audio and text alerts instructing corrective actions.

Extensions:

• 3a. Critical failure persists

• 3a1. Users instructed via pump messages to contact technical support immediately.

Use Case #9: Data Visualization (Metrics and Insights)

Primary Actors: Pump User

Stakeholders: Healthcare provider

Preconditions:

• Pump records weekly insulin usage and glucose data.

Success Guarantee:

• User clearly visualizes and understands data insights for glucose management.

Main Success Scenario:

1. User accesses data visualization features from the pump interface.
2. Pump generates graphical views (trend lines, insulin usage graphs, glucose trends).
3. User reviews graphs for patterns and insights.

Extensions:

• 2a. Visualization feature error

• 2a1. Users are prompted to refresh views or report issues to support.

Use Case #10: Security Management (Pump Access Control)

Primary Actors: Pump User

Stakeholders: Healthcare provider

Preconditions:

• Pump screen-lock settings are accessible.

Success Guarantee:

• User secures pump settings effectively from unauthorized access.

Main Success Scenario:

1. User navigates to security settings.
2. User enables a PIN-based lock screen.
3. Pump confirms security settings applied.

Extensions:

• 2a. User forgets security PIN

• 2a1. Users are prompted to contact technical support for PIN recovery.