Comprehensive Product Requirements Document (PRD)

Project Name: PT-genie (Physical Therapy Digital Assistant)
Design Link: [PT-genie Final Design](#)
Version: 1.1 (Detailed for QA/Testing)

1. Executive Summary

PT-genie is a Physical Therapy assistant app designed to improve patient adherence to Home Exercise Programs (HEP). It utilizes visual guidance, real-time timers, and pain-tracking feedback loops to provide a data-driven recovery path. This document provides the granular detail required for both development and the creation of automated/manual test cases.

2. User Roles & Permissions

- **Patient:** Can view assigned plans, log sessions, track personal metrics, and message the therapist.
- **Therapist (System Actor):** Assigns plans, reviews logged data, and provides feedback (Interactions represented via the App's messaging/notification system).

3. Functional Requirements (Granular)

3.1 Authentication & Onboarding

- **FR-01: Multi-factor Login:** Support for Email/Password and Biometric (FaceID/Fingerprint) login.
- **FR-02: Profile Setup:** Collection of baseline data (Injury type, Surgery date, Weight, Height).
- **Test Cases Focus:** Invalid email formats, incorrect passwords, biometric failure fallback.

3.2 Patient Dashboard (Home)

- **FR-03: Daily Task Logic:** * If current date matches scheduled exercise date: Show "Start Session" and list of exercises.
    - If exercises are complete: Show "All Caught Up" checkmark.
    - If no exercises scheduled: Show "Rest Day" view.

- **FR-04: Progress Ring:** Must dynamically calculate `(Completed Exercises / Total Assigned) * 100`.
- **Test Cases Focus:** Date-rollover logic (timezone testing), 0% vs 100% calculation accuracy.

3.3 Guided Exercise Player

- **FR-05: Media Handling:** * Auto-play video demonstration on loop.
    - High-fidelity audio cues for "Start," "Switch Sides," and "Rest."
- **FR-06: Timer/Rep Logic:** * **Timed Exercises:** Countdown timer with pause/resume functionality.
    - **Rep-based Exercises:** Manual increment or "Genie" auto-count (if applicable).
- **FR-07: Pain Feedback Loop:** * Mandatory pain scale slider (0-10) presented after *each* exercise or at the end of a session.
    - **Logic:** If Pain > 7, display a "Stop/Warning" modal with a direct link to message the therapist.
- **Test Cases Focus:** Interruption handling (Phone call during timer), Pain score threshold triggers, Video buffering states.

3.4 Progress & Recovery Analytics

- **FR-08: Adherence Chart:** Weekly view showing "Sessions Completed" vs "Sessions Missed."
- **FR-09: Range of Motion (ROM) Logging:** Manual entry for degrees of movement (e.g., Knee flexion).
- **Test Cases Focus:** Data visualization with missing data points (null states), Graph scaling for extreme values.

4. UI/UX Design Specifications

- **Visual States:**
    - **Loading:** Shimmer effect on dashboard cards.
    - **Empty:** Illustration and "No Exercises Assigned" text for new users.
    - **Error:** Toast message for network failure during session submission.
- **Interactions:** Long-press on an exercise to view "Detailed Instructions" or "Equipment Needed."
- **Dark Mode:** Design must support system-level dark mode switching without losing accessibility contrast.

5. Technical & Non-Functional Requirements (NFRs)

5.1 Security & Compliance

- **NFR-01:** Encryption of data at rest and in transit (TLS 1.3).
- **NFR-02:** HIPAA Compliance: No Personal Health Information (PHI) in push notifications (e.g., Use "You have a new update" instead of "Your Knee Surgery update").

5.2 Performance & Connectivity

- **NFR-03: Offline Sync:** Users can start a session offline. Data must be cached locally and synced automatically when back online.
- **NFR-04: Latency:** Analytics screens must load in < 1.5 seconds on 4G/LTE.

6. Edge Cases for Test Case Generation

1. **Session Interruption:** User closes app in the middle of a 30-minute session.
   Requirement: App should prompt to "Resume" or "Discard" upon re-entry.
2. **Date/Time Manipulation:** User changes phone clock to bypass "Rest Day."
   Requirement: Use server-side timestamps for scheduling.
3. **Low Storage:** Device is out of space while trying to download exercise videos.
   Requirement: Clear error message and suggestion to stream instead.
4. **Hardware Toggle:** Bluetooth headphones disconnect mid-session. *Requirement: Audio should pause to prevent the user from missing cues.*

7. Appendix: Interaction Dictionary

Element	Input	Output
Pain Slider	Drag 0 -> 10	Update numeric label + Change color (Green -> Red)
Start Button	Tap	Navigate to Player + Start 3s buffer countdown
Next Exercise	Tap	Save previous set data + Load next video asset