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**Software Requirements Specification**

**Project: Health Keeper**

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**Document Sheet**

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| 27/07/2025 |  | Paillacho Carlos, Palacios Daniel, Quiroz María |  |

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# 

# 1 INTRODUCTION

HealthKeeper is a comprehensive caregiving assistant application designed to streamline the daily workflows of professional and family caregivers. By centralizing patient data, scheduling, clinical note–taking, and an array of embedded clinical calculators, HealthKeeper empowers caregivers to make faster, more informed decisions and to focus their time on what matters most—the well‑being of their patients.

## Purpose

The purpose of this requirements specification is to define and describe the functional needs for HealthKeeper’s next release (v2.0.0). It covers foundational features—such as user authentication, patient profile management, vitals charting, medication scheduling, and event logging—alongside 12 new clinical calculation modules (e.g., BMI, eGFR, BMR, Braden Scale) that will automate key assessments and alerts for caregivers.

## Scope

This document applies to all client‑side and server‑side components of HealthKeeper v2.0.0. It addresses user roles (caregiver, administrator), patient data management, real‑time data capture (vital signs, fluid balance), scheduled reminders, and integrated clinical calculators. Non‑functional considerations—such as performance, security, and usability—are covered elsewhere. This specification does not include future modules for telehealth video, third‑party EHR interoperability, or billing.

## 1.3 Involved Staff

|  |  |
| --- | --- |
| **Name:** | Paillacho Carlos |
| **Rol:** | Git Administrator |
| **Professional Category:** | Student |
| **Responsibility:** | File Administrator |

|  |  |
| --- | --- |
| **Name:** | Palacios Daniel |
| **Rol:** | Developer |
| **Professional Category:** | Student |
| **Responsibility:** | Communication and customer service. |

|  |  |
| --- | --- |
| **Name:** | Quiroz María |
| **Rol:** | Developer |
| **Professional Category:** | Student |
| **Responsibility:** | Senior programmer. Code development. |

## 1.4 Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Description** |
| ERS | Software Requirements Specification |

## 1.5 References

|  |  |
| --- | --- |
| **Document** | **Reference** |
| Standard IEEE 830 | IEEE |

## 1.6 Summary

This specification outlines the complete feature set and functional requirements for HealthKeeper v2.0.0, an application tailored to streamline caregiver workflows. It encompasses core modules—user authentication, patient profiles, vital‑sign logging, medication scheduling, and event documentation—augmented by a suite of 12 clinical calculators (e.g., BMI, eGFR, BMR, Braden Scale) that provide on‑demand assessments and threshold‑based alerts. Together, these capabilities will enhance data accuracy, improve decision support, and enable caregivers to deliver timely, personalized care.

# OVERVIEW

HealthKeeper is a modular, client‑server application designed to support the day‑to‑day responsibilities of professional and informal caregivers. The system unifies patient data management, time‑series vital‑sign logging, medication scheduling with reminders, event and note recording, and a suite of embedded clinical calculators—all accessible through an intuitive, role‑based interface. Data is stored centrally on a secure backend, while caregivers interact via desktop or mobile clients, enabling both on‑site and remote monitoring.

By combining core care‑management workflows with automated assessment tools (e.g., BMI, eGFR, Braden Scale), HealthKeeper reduces manual calculation errors, accelerates decision support, and elevates overall care quality. The underlying architecture is service‑oriented, allowing individual modules to be updated independently and new calculators to be plugged in with minimal impact. Detailed logging and alerting mechanisms ensure that critical thresholds trigger notifications, helping caregivers stay proactive.

# Product Perspective

HealthKeeper is a standalone product but is designed for eventual interoperability with electronic health‑record (EHR) systems and telehealth platforms. In its current form, the application comprises:

1. Client Applications

Web Client: HTML5/JavaScript interface for desktop browsers, optimized for data entry and analytics dashboards.

Mobile Client: Native or hybrid UI for tablets and smartphones, focused on on‑the‑go data capture and push‑notification alerts.

1. Backend Services

Authentication Service: OAuth2‑compliant module for secure login and token management.

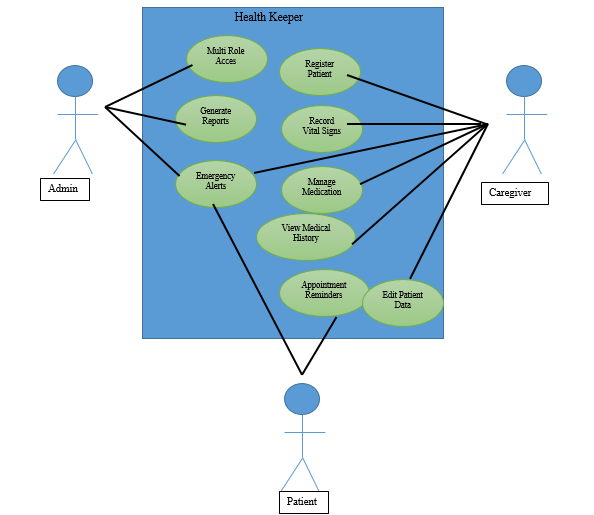
Data API: RESTful endpoints for CRUD operations on patient profiles, vital signs, medications, events, and calculation results.

Calculation Engine: A microservice hosting all clinical calculators (BMI, eGFR, BMR, etc.), exposed via API calls to the client or other backend components.

Notification Service: Scheduler and dispatcher for reminders and threshold‑based alerts via email, SMS, or push notifications.

The modular design permits HealthKeeper to operate in an isolated environment (e.g., a single clinic) or to integrate later with third‑party health platforms via standard FHIR-based interfaces. This flexibility ensures that as organizational needs grow, HealthKeeper can evolve without a complete system rewrit

## 2.2 Product Functionality



## 2.3 User Characteristics

|  |  |
| --- | --- |
| **User type:** | Caregiver |
| **Category:** | Caregiver |
| **Activities:** | Fulfill the responsibilities of a patient caregiver. |

## 2.4 Constraints

* Console-only platform.
* Programming language: Java.
* Predefined accounts.
* Does not process data in real time.
* Basic hardware resources.
* Basic authentication.

## 2.5 Assumptions and Dependencies

* It is assumed that the computers where the program will be executed have the hardware and software necessary for its proper operation.
* It is assumed that the users (caregivers) will follow the agreed-upon, predefined procedure.
* The program should be able to run on any computer with Java.

# 3 SPECIFIC REQUIREMENTS

## 3.1 Functional Requirements

|  |  |
| --- | --- |
| Requirement ID: | RF01 |
| Requirement Name: | User authentication and role-based access control |
| Characteristics: | Secure, standards‑compliant authentication with fine‑grained role controls. |
| Requirement Description: | Secure login and restrict features by user role |
| Requirement Priority: | High |

|  |  |
| --- | --- |
| Requirement ID: | RF02 |
| Requirement Name: | Patient profile management |
| Characteristics: | Flexible profile CRUD operations with validation and audit trail. |
| Requirement Description: | Create, view, update, delete patient demographics |
| Requirement Priority: | High |

|  |  |
| --- | --- |
| Requirement ID: | RF03 |
| Requirement Name: | Vital signs recording |
| Characteristics: | Real‑time logging and graphical trends; supports interpolation for missing data. |
| Requirement Description: | Log and visualize time‑series of vital signs |
| Requirement Priority: | High |

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| --- | --- |
| Requirement ID: | RF04 |
| Requirement Name: | Medication schedule and reminders |
| Characteristics: | Configurable schedule engine with push/sms reminders and retry logic. |
| Requirement Description: | Schedule doses, send reminders |
| Requirement Priority: | High |

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| --- | --- |
| Requirement ID: | RF05 |
| Requirement Name: | Event and note logging |
| Characteristics: | Timestamped, searchable event log with rich‑text support. |
| Requirement Description: | Record clinical notes and events |
| Requirement Priority: | Medium |

|  |  |
| --- | --- |
| Requirement ID: | RF06 |
| Requirement Name: | Body Mass Index (BMI) calculation |
| Characteristics: | Instant BMI computation with built‑in categorization and threshold alerts. |
| Requirement Description: | Assess nutritional status |
| Requirement Priority: | Medium |

|  |  |
| --- | --- |
| Requirement ID: | RF07 |
| Requirement Name: | Weight‑based medication dosing |
| Characteristics: | Weight‑based dosing calculator that auto‑rounds to safe increments. |
| Requirement Description: | Assess nutritional status |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF08 |
| Requirement Name: | Estimated Glomerular Filtration Rate (eGFR) |
| Characteristics: | eGFR formula implementation (CKD‑EPI/MDRD) with staging flags. |
| Requirement Description: | Evaluate renal function |
| Requirement Priority: | Medium |

|  |  |
| --- | --- |
| Requirement ID: | RF09 |
| Requirement Name: | Daily fluid balance |
| Characteristics: | Automated intake/output aggregation and negative‑balance alerts. |
| Requirement Description: | Track fluid input vs. Output |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF10 |
| Requirement Name: | Estimated daily caloric needs |
| Characteristics: | Mifflin‑St Jeor based caloric estimate with activity‑level multipliers. |
| Requirement Description: | Guide nutritional planning |
| Requirement Priority: | Medium |

|  |  |
| --- | --- |
| Requirement ID: | RF11 |
| Requirement Name: | Target heart rate zones |
| Characteristics: | Age‑adjusted HRmax calculation with customizable zone percentages. |
| Requirement Description: | Define safe exercise intensity |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF12 |
| Requirement Name: | Dehydration risk score |
| Characteristics: | Composite risk score algorithm combining objective and subjective inputs. |
| Requirement Description: | Early detection of dehydration |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF13 |
| Requirement Name: | Body Surface Area (BSA) calculation |
| Characteristics: | Du Bois BSA computation for precision dosing and fluid planning. |
| Requirement Description: | Calculate BSA for dosing and fluid needs |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF14 |
| Requirement Name: | Ideal Body Weight (IBW) estimation |
| Characteristics: | Devine IBW estimation with sex‑specific coefficients. |
| Requirement Description: | Assess target weight |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF15 |
| Requirement Name: | Adjusted drug dose for renal impairment |
| Characteristics: | Dynamic dose adjustment module factoring in renal clearance. |
| Requirement Description: | Modify dose based on eGFR |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF16 |
| Requirement Name: | Basal Metabolic Rate (BMR) calculation |
| Characteristics: | Harris‑Benedict BMR calculator with gender‑specific constants. |
| Requirement Description: | Estimate resting energy expenditure |
| Requirement Priority: | Medium |

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| --- | --- |
| Requirement ID: | RF17 |
| Requirement Name: | Pressure ulcer risk scoring (Braden Scale) |
| Characteristics: | Characteristics: Braden Scale scorer with auto‑threshold risk classification and guidance. |
| Requirement Description: | Quantify risk of skin breakdown |
| Requirement Priority: | Medium |