

Mom Guide Plus — Detailed Requirements (v0.1)

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Author: Drafted from UI review

Scope: Maternal & infant health companion supporting pregnancy tracking, mental-health screening, device integration, telehealth, analytics, and billing.

1) Summary & Goals

- Provide an end-to-end patient portal for pregnant/postpartum users and a companion console for providers and billing staff.
- Centralize pregnancy timeline, appointments, medications, health records (EHR), mental-health screenings, wearable data, telehealth visits, population analytics, and CPT billing.
- Ensure HIPAA compliance, strong privacy controls, auditability, and multi-role access.

Primary Outcomes - Increased adherence (meds, screenings, visits).

- Early risk detection (via screenings + devices).
 - Efficient virtual care (telehealth + RPM).
 - Accurate, transparent billing (CPT / claims).
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2) Personas & Roles

- **Patient/Mother:** logs data, completes screenings, connects devices, schedules visits, joins video, views summaries.
- **Provider/Clinician** (OB/GYN, MFM, RN): manages care plans, views risk, receives alerts, conducts telehealth.
- **Billing Staff:** manages CPT codes, claims, payments, insurance, and reports.
- **Administrator:** user/org setup, role & permission management, templates, integrations, analytics access.

RBAC (high-level): Patients can access own PHI; providers access assigned patients; billing staff access financial objects; admins manage system-level settings. All access is least-privilege and fully audited.

3) Information Architecture & Navigation

Bottom nav modules inferred from UI: 1. **Home** 2. **Pregnancy** 3. **Appts** 4. **Meds** 5. **Records** 6. **Mental** 7. **Devices** 8. **Video** 9. **Analytics** 10. **Billing**

Each module includes sub-tabs (per screen) and a consistent action bar, search as applicable, and export where shown.

4) Functional Requirements by Module

4.1 Home Dashboard ("Mom Guide Plus")

UI cues: Days Postpartum card; Baby Weight; Mood Score; Sleep Quality; actions: *Log Feeding*, *Mood Check*, *Health Summary*.

Requirements - Show 4 key KPI cards with latest values and units.

- Actions: - **Log Feeding:** quick entry (time, type, quantity, notes).

- **Mood Check:** jumps to Mental > screening flow.

- **Health Summary:** generates a shareable clinical summary (PDF) of recent vitals, screenings, meds, appointments, and device metrics. - Data freshness indicators and source (manual/device/EHR).

- Empty states for first-time users with guided onboarding.

Acceptance - Given a user with data, the 4 cards display last recorded values.

- Clicking *Log Feeding* opens a modal/route and saving updates KPIs.

- *Health Summary* exports a PDF under Records > Export.

4.2 Pregnancy Journey

Tabs seen: Timeline, History, Care, Risk, Support, Provider, **Appts, Meds, Records**.

Timeline - Fields: **Conception Date, Due Date** (calendar pickers).

- Auto-compute gestational age and trimester; display milestones (e.g., 20-week ultrasound).

- Edit history with timestamps.

History - Record previous pregnancies, deliveries, complications.

Care - Care plan sections (nutrition, activity, prenatal testing, education).

- Tasks with due dates and completion tracking.

Risk - Risk assessments ingestion (from screenings/devices).

- Risk flags (e.g., preeclampsia risk, depression risk) with thresholds and escalation policy.

Support - Social support contacts, education links, community resources; consented care-partner access.

Provider - Assigned practice/provider(s); messaging entry point.

Appts/Meds/Records - Deep-links to those modules filtered by this pregnancy.

Acceptance - Updating Conception/Due dates recalculates gestational age within 1 sec.

- Risk tab surfaces flags when underlying scores exceed configured thresholds.

4.3 Appointments (Schedule + Upcoming)

UI cues: Date, Time, Provider dropdown, Appointment Type, Location, Notes; *Schedule Appointment*; list of upcoming visits.

Requirements - Create, edit, cancel appointments; types include prenatal checkup, ultrasound, telehealth, etc.

- Provider directory (name, specialty, location).
- Calendar picker + time slot validation (provider availability).
- Notifications: confirmation + reminders (email/SMS/in-app).
- Add to device calendar (ICS).
- Upcoming list with status badges; reschedule/cancel controls with policy.

Acceptance - Conflicting time slots are blocked; successful scheduling appears under *Upcoming Appointments* and triggers a confirmation notification.

4.4 Medications

UI cues: Add New Medication (name, dosage, time of day, frequency, prescriber, notes); *Current Medications* list; weekly adherence tracker (Sun-Sat checkmarks).

Requirements - Add/edit/stop medications with structured fields and PRN support.

- Multiple daily doses and reminders by local timezone.
- Instruction tags (e.g., "Take with food").
- Adherence tracking: per-dose checkmarks; missed dose prompts.
- Prescriber attribution and attachment of Rx photo/PDF.
- Refill reminders based on quantity/remaining days.

Acceptance - Creating a daily med schedules reminders at selected time; the tracker shows checkmarks when user marks dose taken; adherence % shown weekly.

4.5 Records (EHR Integration)

UI cues: Tabs: Connect | Records | Export; *Select Your EHR Provider* dropdown; consent statement.

Requirements - OAuth-based connection to EHR vendors (FHIR-compatible).

- Explicit consent screen with scope of access; revoke anytime.
- Pull records: encounters, problems, allergies, meds, labs, imaging, immunizations.
- Display timeline & search; tag source (EHR vs Uploaded).
- Export selected records to PDF or FHIR bundle.

Acceptance - After connection, records tab lists items with categories; *Export* produces a downloadable file; consent status visible and auditable.

4.6 Mental Health Screening

UI cues: Tool selector **EPDS, GAD-7, PHQ-9**; stepper: “EPDS Question 1/10” with multiple-choice; *Next*.

Requirements - Implement EPDS (10Q), GAD-7 (7Q), PHQ-9 (9Q) with validated scoring and cutoff ranges.

- On completion, compute score + severity band; present guidance and crisis resources when severe.
- Persist longitudinal history and trend chart.
- Provider alerts when scores cross thresholds; create task/follow-up.

Acceptance - Submitting a tool stores responses, shows score and severity, and (if over threshold) creates a provider alert within 60 seconds.

4.7 Devices (Wearable Integration)

UI cues: Device cards: Apple Watch Series 9 (Connected), Fitbit Sense 2 (Disconnected), Oura Ring Gen3 (Connected); Battery indicator; tabs: Devices | Health Metrics | AI Insights.

Requirements - Connect/disconnect flows per vendor (Apple Health/HealthKit, Fitbit API, Oura API).

- Ingest metrics: HR, HRV, sleep, steps, SpO2, temperature, BP (if supported).
- Device status & battery; sync frequency controls; data provenance tags.
- *Health Metrics* tab: charts with date filters.
- *AI Insights* tab: summaries (e.g., sleep debt, recovery trends) with plain-language recommendations.

Acceptance - When connected, metrics for last 24h display; disconnect removes future syncing (retains historical data with provenance).

4.8 Video / Telehealth Portal (RPM overview)

UI cues: RPM banner with vitals: **BPM 72, BP 120/80, Temp 98.6°F, O2 Sat 98%**; provider card (Dr. Sarah Johnson) with *Join Video Call* and *Send Message*; tabs for Appointments, Emergency, Groups, Rx, Monitor, AI Assessment, Security.

Requirements - Launch HIPAA-compliant video session (WebRTC provider).

- Secure chat/messaging with attachments.
- RPM dashboard with latest vitals from devices/EHR; thresholds and alerting.
- Emergency banner/action; AI assessment summarizing recent risk signals.
- Session notes and encounter export to Records.

Acceptance - Clicking *Join Video Call* opens a video room; vitals update within the selected time window; ending session creates an encounter summary.

4.9 Analytics (Population & Program)

UI cues: KPIs: **Total Patients (1,247)**, **Active Pregnancies (892)**, **Risk Assessments (156)**, **Screenings Completed (743)**; tabs: Overview, Trends, Risk Analysis, Demographics; date range control; *Export*.

Requirements - Time-bounded dashboards with drill-downs by cohort (trimester, facility, payer, risk band).

- Trend lines for screenings, adherence, telehealth utilization.
- Risk analysis (e.g., % high EPDS, elevated BP).
- Demographics breakdown (age, region, parity).
- Export CSV/PDF.

Acceptance - Changing date range updates all widgets; exports reflect visible filters.

4.10 Billing (CPT Management)

UI cues: Tabs: CPT Billing | Payment | Claims | Insurance | Reports | History; **Available CPT Codes** list with search and "+" add; **Selected Codes** panel; **Billing Summary** with **Generate Bill** and **Export Bill**.

Requirements - CPT searchable catalog (OB/GYN set including 59400, 59510, 59425, 59426 etc.).

- Build encounter bills by adding CPTs; compute total based on configured fee schedule (payer/region).
- Link bills to patient encounters/visits; validation rules (mutually exclusive codes).
- Claims pipeline (837P/EDI submission ready), payment posting, insurance eligibility, and reporting.
- History/audit of generated bills and exports.

Acceptance - Selecting codes populates *Selected Codes*; *Generate Bill* creates a bill with sum total; *Export Bill* produces a statement PDF.

5) Cross-Cutting Capabilities

- **User & Org Management:** Patient, Provider, Billing Staff, Admin roles; clinics/organizations; invitations and SSO (OIDC).
 - **Notifications:** Email/SMS/in-app for appointments, meds, alerts; quiet hours; consent preferences.
 - **Consent & Sharing:** Patient consents for EHR/device access; revoke; download audit.
 - **Audit Logging:** Every PHI view/edit, export, login; immutable store with retention policy.
 - **Search & Export:** Global search across Records/Notes; export selected data (PDF/CSV/FHIR).
 - **Localization & Timezone:** i18n; locale date/time; metric/imperial units.
 - **Accessibility:** WCAG 2.2 AA compliance.
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6) Data Model (core entities)

- **User**(id, role, name, email, locale, timezone, MFA_enabled)
- **PatientProfile**(id, user_id, DOB, parity, address, emergency_contact)
- **Provider**(id, name, specialty, location, NPI)

- **Pregnancy**(id, patient_id, conception_date, due_date, status, risk_level)
- **Appointment**(id, patient_id, provider_id, type, start_ts, end_ts, location, status, notes)
- **Medication**(id, patient_id, name, dosage, frequency, times_of_day[], instructions[], prescriber_id, active)
- **AdherenceEvent**(id, medication_id, ts, taken:boolean, notes)
- **EHRConnection**(id, patient_id, vendor, status, scopes[], connected_at, revoked_at)
- **RecordItem**(id, patient_id, category, source, occurred_at, payload)
- **Screening**(id, patient_id, tool, score, severity, completed_at, responses)
- **Device**(id, patient_id, vendor, model, status, battery_pct)
- **DeviceMetric**(id, device_id, type, value, unit, sampled_at, provenance)
- **Televisit**(id, patient_id, provider_id, started_at, ended_at, summary, artifacts)
- **Bill**(id, patient_id, encounter_id, codes[], total_amount, status)
- **Claim**(id, bill_id, payer_id, status, submission_ref, adjudication)
- **InsurancePolicy**(id, patient_id, payer, member_id, plan, effective_range)
- **AuditEvent**(id, actor_id, action, object_type, object_id, ts, ip)

Use FHIR resources as canonical where possible (Patient, Encounter, Observation, MedicationStatement/Request, Questionnaire/Response, Claim, etc.).

7) Integrations

- **EHR:** FHIR R4 (SMART on FHIR/OAuth); read: Patient, Encounter, Condition, Observation, Medication, Procedure, DocumentReference.
 - **Wearables:** Apple HealthKit (via device app), Fitbit Web API, Oura Cloud API.
 - **Video:** WebRTC provider (e.g., Twilio or Vonage); BAA required.
 - **Messaging:** Email (SES/SendGrid), SMS (Twilio).
 - **CPT Catalog:** Internal table seeded from AMA CPT (licensing considerations).
 - **Payments/Claims:** Clearinghouse integration for 837/835 (future phase if needed).
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8) Security, Privacy & Compliance (HIPAA)

- **Encryption:** TLS 1.2+ in transit; AES-256 at rest; KMS-managed keys; secrets in vault.
 - **Access Controls:** RBAC + ABAC; session timeouts; MFA for staff; device verification.
 - **PHI Boundaries:** Data minimization; structured consent; field-level encryption for sensitive artifacts.
 - **Audit & Monitoring:** PHI access logs, anomaly detection, SIEM feeds; breach response runbook.
 - **Data Retention:** Configurable retention; export on request; deletion workflows.
 - **BAAs:** With all downstream processors (video, SMS/email, EHR vendors as applicable).
 - **Network:** Private VPC, WAF, least-privilege IAM, periodic pen-tests.
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9) Non-Functional Requirements

- **Availability:** 99.9% monthly; scheduled maintenance windows communicated.
- **Performance:** P95 page load < 2.5s on broadband; API P95 < 400ms for standard queries.

- **Capacity:** Up to 50k active patients; scalable ingestion (device metrics up to 5/min per device).
 - **Observability:** Tracing, metrics, logs; health checks; SLO dashboards.
 - **Backup/DR:** Daily encrypted backups; RPO \leq 24h, RTO \leq 4h.
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10) Eventing & Alerts

- Threshold rules (e.g., BP > 140/90, EPDS \geq 13) trigger clinician alerts and patient guidance.
 - Deduplication & cooldowns; escalation ladder (push \rightarrow SMS \rightarrow call center for critical).
 - Alert views with acknowledge/assign/resolve workflow.
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11) Reporting & Exports

- Per-patient summary PDF (Home > Health Summary).
 - Analytics CSV/PDF exports (date-bounded).
 - Billing statements PDFs; claim files (future).
 - Audit exports for compliance.
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12) Sample Workflows

1. **Onboard Patient \rightarrow Connect EHR \rightarrow Import history.**
 2. **Schedule Prenatal Visit \rightarrow SMS reminder \rightarrow Televisit \rightarrow Encounter summary to Records.**
 3. **Start Medication \rightarrow Daily reminders \rightarrow Adherence tracking \rightarrow Provider review.**
 4. **EPDS screening \rightarrow High score alert \rightarrow Care plan task \rightarrow Follow-up scheduled.**
 5. **Connect Oura \rightarrow Sleep insights \rightarrow Education tips shown on Home.**
 6. **Add CPTs after visit \rightarrow Generate bill \rightarrow Export PDF / Submit claim (future).**
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13) Assumptions & Open Items (to validate)

- Fee schedules & CPT pricing are clinic-configurable; AMA licensing in place for CPT codes.
 - EHRs targeted for initial release: Epic, Cerner, athenahealth (via SMART on FHIR).
 - Video provider under BAA; recording disabled by default.
 - Device data rights: patient grants ongoing consent and can revoke; historical data retained.
 - Multitenancy required (multiple clinics).
 - Mobile responsive web is MVP; native apps are later.
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14) Out of Scope (MVP)

- Claims EDI submission & ERA posting (placeholder pipelines only).
- Advanced care pathways with automation rules editor.

- Patient-to-patient community features.

15) Acceptance Test Matrix (excerpt)

| Module | Scenario | Expected |
|---------|--------------------|---|
| Mental | EPDS score 14 | Severity = "High", provider alert created, crisis resources shown |
| Meds | Mark dose taken | Day checkbox turns green; adherence % updates |
| Appts | Double-booked slot | Error shown; cannot save |
| Records | Revoke EHR consent | Connection status = Revoked; future syncs stop |
| Billing | Add 59400 + 59510 | Rule prevents mutually exclusive codes |

End of v0.1