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MedNeura & Maternal Health: Synergies

Purpose

This document explains how MedNeura's capabilities (voice, text, video, file upload, CHW support, and analytics) address the priorities of maternal health programs in low-resource settings.

Executive Summary

MedNeura delivers maternal health focused clinical intelligence across two operational modes: (A) interactions that require internet connectivity (app/web with text, voice, video, image/file upload) and (B) interactions that do not require internet (cellular voice via IVR/hotline). The system is designed so CHWs, who are the primary users of the internet-enabled app, can use full AI capabilities during outreach where connectivity exists, while mothers without internet access can still reach life-critical triage via the helpline. Together these modalities offer comprehensive coverage for antenatal care, intrapartum risk screening, postnatal follow-up, and emergency escalation.

1. Key Design Principle

Match capability to connectivity. Where internet is available (CHW device, clinic, community hub) use the full system (voice, text, images, video, file upload). Where it is not (mother with a basic phone) provide a robust, voice-first IVR hotline that captures essential triage and triggers CHW follow-up.

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2. Capabilities (Categorized by Connectivity)

A. Internet-Required (App / Web) - Full AI System

These features require online connectivity and are intended primarily for CHWs, clinic staff, and mothers with smartphones:

- **Text consultations:** Secure chat with AI guidance, structured pregnancy checklists, symptom logging.
- **Internet voice consultations:** Real-time voice calls over data with AI-driven guidance.
- **Video consultations:** Real-time visual context for AI to observe wounds, swelling, or labour complications when bandwidth allows.
- **Medical file upload & analysis:** Photos (wounds, jaundice), scanned lab results, and PDFs can be uploaded and analyzed for contextual recommendations and flagged for clinician review.
- **Visual analysis:** AI-assisted image analysis for pallor, wound infection, or swelling with results stored in the patient record.
- **CHW dashboard & tasking:** CHWs see assigned follow-ups, referral status, and patient history. They can attach images or notes from visits.
- **Consent capture & secure storage:** Digital consent flows and encrypted file storage with role-based access for clinics and partners.

B. No-Internet (Cellular Voice / IVR / USSD) - Basic but Critical Triage

These features run over regular cellular networks and are aimed at mothers with feature phones or low bandwidth:

- **IVR hotline with NGO code entry:** Voice prompts guide callers through a maternal triage flow and collect an NGO code for attribution.
- **Short decision trees:** Focused pregnancy/danger sign screening leading to immediate advice or referral instructions.

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- **Callback / CHW task generation:** High-risk calls automatically create CHW follow-up tasks in the system for offline field action.
- **USSD menus (where appropriate):** Low-bandwidth, menu-driven symptom check or to request a CHW visit.

3. Primary Use Cases Across Modalities

Internet Modes (App/Web)

Use Case 1: CHW-led antenatal assessment (field visit) CHW opens MedNeura app, selects the mother, runs a structured antenatal assessment, uploads a photo of any visible problem, and receives evidence-based next steps and referral suggestions. The consultation is logged and scheduled for follow-up.

Use Case 2: AI visual assessment with image support CHW uploads a photo and lab result PDF. MedNeura analyzes and highlights areas of concern, providing immediate clinical guidance and recommendations.

Use Case 3: Text support for postpartum counselling Mothers or CHWs use chat to ask for breastfeeding, wound care, or contraception counselling. The chat transcript and recommended actions are stored in the patient record.

Use Case 4: Teletriage and referral coordination When a CHW identifies a high-risk case, MedNeura pre-populates referral notes, sends them to the named facility (via SMS/email), and places the case on the referral tracker.

No-Internet Modes (IVR/USSD/Cellular)

Use Case 5: Immediate danger sign triage (mother at home) Mother calls the helpline, enters NGO code, responds to voice prompts. MedNeura flags high-risk signs and instructs immediate facility transfer while notifying the CHW.

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Use Case 6: Emergency stabilization guidance Family reports heavy bleeding. IVR provides immediate basic stabilization steps (pressure, positioning) and connects to an on-call clinician when available.

Use Case 7: CHW tasking after hotline triage Hotline flags a case. CHW receives a task with location and context so they can visit the mother and perform in-person assessment.

4. CHW Workflows & Handoffs

1. **Registration & consent:** CHWs register beneficiaries through the app when possible. For hotline callers, a minimal consent script is used and NGO code captured.
2. **Triage & action:** CHW or mother interaction runs triage. High-risk results generate immediate escalation tasks.
3. **Referral coordination:** System preps referral notes and sends facility alerts. CHW supports transport and handover.
4. **Follow-up loop:** CHW confirms outcome in the app. The system updates KPIs and marks referral completed.

5. Data, Attribution & Reporting

- **NGO codes** are captured at intake for attribution across calls and app use.
- **Session logs** include anonymized IDs, timestamps, consultation modality, CHW ID (if any), NGO code, and outcome tags (advice only / CHW visit / facility referral).
- **File uploads** (images, PDFs) are tied to a patient's record. Sensitive identifiers are stored separately and encrypted.
- **Exports & dashboards** provide NGO-specific reports filtered by NGO code, location, and date range.

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6. Quality Assurance & Clinical Safety

- **Evidence-aligned triage:** All maternal triage scripts follow accepted clinical protocols and are co-designed with local clinicians.
- **QA sampling:** Periodic manual review of transcripts, image analyses, and outcome concordance with facility records.
- **Escalation safeguards:** Clear thresholds for automatic escalation to human clinicians and for CHW mobilization.

7. Minimal Requirements

- **For CHWs / clinics (internet required):** Android devices or tablets, intermittent internet access (3G/4G), occasional power for charging, and a browser or app to run voice/text/video consultations.
- **For mothers without internet:** Any GSM phone for IVR/USSD. Local language voice prompts are used.

8. Monitoring & Evaluation (Program KPIs)

Consultations by modality, unique beneficiaries, referral rates, median time-to-referral, CHW adoption, hotline drop rates and sampled clinical outcome verification. Dashboards support NGO reporting needs.

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9. Privacy, Consent & Governance

Clear consent scripts for voice and app, minimized data collection, encrypted storage of identifiers, role-based dashboard access, and MOUs for any raw data sharing with partners.

10. Adoption & Change Management

- **Community engagement** to explain modalities and NGO code usage.
- **CHW training** focused on app use (internet mode), capturing consent, uploading images, and referral workflows.
- **Hotline scripts & simple job aids** for low-literacy mothers using IVR.

11. Expected Impact

Clinical Outcomes:

- 40-60% reduction in preventable maternal deaths in coverage areas
- 80%+ early detection of major complications before they become emergencies
- 30-50% reduction in maternal near-miss events requiring emergency intervention
- Increased facility delivery for high-risk pregnancies from baseline of approximately 35% to target of 70%
- Improved antenatal care attendance and quality
- Enhanced postpartum care coverage in the critical first weeks

Health System Impact:

- More efficient triage ensuring right care, right level, right time
- Reduced facility overcrowding through better routing of cases

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- Early detection prevents complications from escalating to emergencies
- CHW workforce becomes significantly more capable and confident
- Real-time data reveals where interventions are most needed
- Stronger linkages between community and facility care

Community and Equity Impact:

- Women who previously had zero prenatal care now receive continuous support
- Remote communities gain access to clinical knowledge regardless of distance
- Language and literacy barriers are overcome through voice-first design
- Economic barriers reduced as women receive guidance without transport costs for routine concerns
- Women gain knowledge about their bodies and confidence to recognize danger signs
- Traditional birth attendants become integrated into safe care pathways rather than isolated

For partnership inquiries, please contact info@bioneurax.com