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Assessing the effectiveness of Large Language Model (LLM) -  
enabled nurse treatment planning in 2 Indian districts: A  
pilot study  
ETHICS REVIEW SUBMISSION – PROTOCOL, TOOLS & CONSENT  
FORMS

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## I. Background and Rationale

Large language model (LLM) based generative artificial intelligence (AI) is revolutionizing healthcare by enhancing diagnostic accuracy, personalizing treatments, and streamlining clinical decision-making. By offering evidence-based recommendations, AI empowers healthcare providers to develop more effective care plans. This capability is especially promising in low- and middle-income countries (LMICs), where urban–rural disparities in healthcare provider availability hinder access to quality care.

In India—home to 1.43 billion people—a critical urban–rural divide persists. For example, the National Medical Commission reports that India’s overall doctor-population ratio is 1 per 843 persons (*Update on Ratio Of Patients And Doctors Nurses*, 2023), and the Economic Survey (2024-2025) stated that doctor density is 3.8 times higher in urban than in rural areas (Desk, 2025). Using the most recent World Bank rural and urban population distribution, this implies 1 physician per 2,550 rural residents versus 1 per 670 residents in urban India, which is more than a three-fold disparity. Although current initiatives, including availability of health and wellness centers, infrastructure investments, telemedicine, and public–private partnerships in conjunction with longstanding community health worker programs like ASHA aim to mitigate these disparities, significant gaps remain. Leveraging AI tools to empower non-physician healthcare workers (e.g., nurses) to develop patient care plans represents a novel strategy to improve healthcare access and quality in underserved regions.

LLMs have proven to be better than physicians in clinical reasoning and evidence based clinical solution when provided with clinical vignettes or diagnosis, respectively (Goh et al., 2024; Nori et al., 2025; Rao et al., 2023). However, LLMs have not been assessed for their ability to generate a clinical vignette via multiturn conversations when starting from a chief complaint. Some advances have been made in AI systems to conduct diagnostic dialogue with patient actors. For instance, AMIE by Google has shown superior history-taking and diagnostic accuracy in randomized, text-chat consultations with validated patient actors, yet it remains a research prototype that has not been tested in real-world clinical encounters.(Tu et al., 2025). To the best of our knowledge, LLMs have also not been assessed in real-life scenarios in resource-constrained settings.

This research protocol outlines the plan for a within-subject, paired comparison study ( a type of crossover study design) to test the effectiveness of nurse - LLM paired solution in clinical reasoning and evidence-based clinical solutions in primary care settings when used for actual patients in a real-life encounter in a resource constrained LMIC context.

The proposed pilot project will evaluate the effectiveness of the intervention for managing Hypertension, Diabetes Mellitus (DM), musculoskeletal pain, breathlessness and fever. According to the ICMR-INDIAB study (2022), the weighted prevalence of DM and hypertension among adults  $\geq 20$ years was 11.4% and 35.5%, respectively (Anjana et al., 2023). Another nation-wide study (POSEIDON study) estimated that fever (35.5%) was the most common symptom among patients presenting to a primary healthcare provider, more than half (50%) of all patients had respiratory symptoms, almost 10% patients had musculoskeletal symptoms (Salvi et al., 2015). High burden of

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these conditions and symptoms underscores the urgent need for scalable, high-quality care solutions in primary care settings.

The research team will also study the user (nurse) and client (patient) experience of participating in an LLM empowered solution for bridging gaps in human resource for healthcare. The nurses' experience will be captured through qualitative methods and the patient experience will be assessed via mixed methods.

## II. Objectives

1. Assess the effectiveness of LLM-enabled, nurse-led treatment planning for select NCDs and symptoms compared to the standard of care. (primary objective)
2. Measure the attitudes, enablers and barriers of patients towards a nurse + LLM care intervention in primary healthcare settings. (secondary objective I)
3. Describe the attitudes and perceptions of nurses in using LLM tools in their clinical practice. (secondary objective II)

## III. Methodology

This is a randomized, crossover study with embedded qualitative interviews for nurses and a cross-sectional exit survey for patients. Prior to patient enrolment, the LLM model and interface selection for the purpose of this study will be undertaken.

### A. LLM model selection

Safety, clinical accuracy and adaptability to changing contexts are few of the many critical characteristics necessary for an LLM to be deployed in population-level clinical practice. Although there has been a rapid surge in the number of LLMs that can provide insights into clinical conditions, the reliability, accuracy, and relevance of these model outputs need to be systematically assessed before it can be deployed for programmatic use. HealthBench, by OpenAI is the largest known open-source benchmarking evidence available to compare various LLMs(Arora et al., 2025). HealthBench was developed to evaluate LLMs on real-world healthcare tasks such as clinical decision support, symptom triage, and patient communication. Developed in collaboration with 262 physicians across 60 countries, HealthBench features 5,000 multi-turn, open-ended clinical scenarios assessed in 49 languages using 48,562 rubric-based criteria. It evaluates performance across five critical domains: scientific and clinical reasoning, patient safety, helpfulness, patient-centered care, and equitable communication.

The March 2025 release of HealthBench evaluated 11 themes – which included global health as one. The criteria for assessing cases in the global health theme were:

- i. Adaptation to Resource Constraints  
Could the model recognize limited availability of tests, treatments, or specialists and adjust its recommendations accordingly?

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- ii. Contextual Relevance  
Did the model align its responses with local epidemiology, common health conditions, and standard practices in LMICs?
- iii. Cultural and Linguistic Appropriateness  
Was the communication culturally sensitive and linguistically accessible across diverse populations?
- iv. Clinical Accuracy and Safety  
Were the medical recommendations both accurate and safe, especially in settings where clinical guidelines may differ?
- v. Recognition of Systemic Limitations  
Did the model identify when ideal care options might not be feasible and offer reasonable, safe alternatives?

The LLM selection for this study will be anchored in evidence from the HealthBench. o3 by OpenAI (60%), Grok 3 by X (54%) and Gemini 2.4 Pro by Google (52%) achieved similar overall performance scores. These models or others available in another HealthBench update before the study rollout will be vetted by a technology partner and by nurses (users) in a human-centered design workshop for practical considerations (Arora et al., 2025).

## **B. Interface & usability testing**

We will conduct a structured human-centered design (HCD) workshop that integrates clinical simulation and usability evaluation. A HCD workshop is a structured, participatory process that places end users—such as patients, nurses, or physicians—at the center of solution development. It draws on methods from design thinking and behavioral science to understand users' needs, generate ideas, and prototype solutions. Core principles include empathy, co-creation, iteration, and user testing. A group of MD-level physicians will first develop a set of realistic clinical cases on hypertension, diabetes mellitus, fever, breathlessness, and musculoskeletal pain representing common scenarios encountered in the target healthcare setting. These cases will be used to assess how nurses interact with different combinations of LLMs and user interfaces. A group of 10 to 15 practicing nurses will participate in a simulation exercise, where they solve these clinical cases using pre-selected LLM-interface combinations. The interfaces will vary in modality to reflect possible real-world deployments, including audio-only (spoken input/output) and multimodal interface (combining text and audio). Following each case, participants will independently rate their experience using a usability evaluation tool focusing on clarity, ease of use, responsiveness, and confidence in clinical decision-making. Structured debriefs and group discussions will follow to gather qualitative feedback on barriers, preferences, and perceived trustworthiness of the model-interface combinations. Findings from this exercise will inform the selection of the

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optimal LLM-interface combination for the implementation study and workflow integration strategies.

## C. Study design

### 1. Primary objective:

The intervention (nurse + LLM - patient encounter) and control (licensed physician - patient encounter) will be sequential. Each patient will participate in both the intervention and control arms, at the end of which separate treatment and follow-up plans are generated. This allows for direct comparisons within the same individual; thus, controlling for between-subject variability that may otherwise influence outcomes. Since the same patients are evaluated under both intervention and control, we can pair each nurse - LLM treatment outcome with the corresponding doctor-led outcome for that patient.

Advantages:

- Reduction in variability: Each patient acts as their own control, confounding variables like age, comorbidities and lifestyle factors are inherently balanced.
- Increased statistical power: Paired design typically requires a smaller sample size to detect a given effect compared to parallel group designs because variability between study subjects is minimized making it a practical study design option for implementation science research.

### 2. Secondary objective I

A cross-sectional exit survey will assess patient experience following LLM-assisted, nurse-led care using a brief tool developed from validated frameworks. Questions are adapted primarily from the WHO Health System Responsiveness domains (e.g., dignity, autonomy, etc), a globally recognized framework assessing dignity, communication, autonomy, and other aspects of patient experience in diverse health systems (Darby et al., 2000). Additional items are adapted from the Patient Satisfaction Questionnaire (PSQ-18), a widely used patient satisfaction tool developed by RAND Corporation (Marshall & Hays, 1994). AI-specific questions on trust and comfort are based on recent literature evaluating patient perceptions of AI in healthcare (Nong & Platt, 2025). The tool will be pilot tested for clarity and cultural relevance to ensure appropriateness for the study population. To complement the quantitative findings from the exit survey, we will conduct in-depth interviews (IDIs) with a small, purposively selected sample of patients. These interviews will provide richer insights into patients' perceptions, trust, and comfort with the AI-assisted nurse consultations, allowing us to explore contextual nuances and explanations that may not be captured through structured survey responses.

### 3. Secondary objective II

As part of the study, we will conduct IDIs with participating nurses to explore their experiences using the LLM during patient care. These interviews will provide qualitative insights into the usability, perceived accuracy, clinical relevance, and workflow integration of the LLM tool. Nurses will be asked about their comfort level, trust in the

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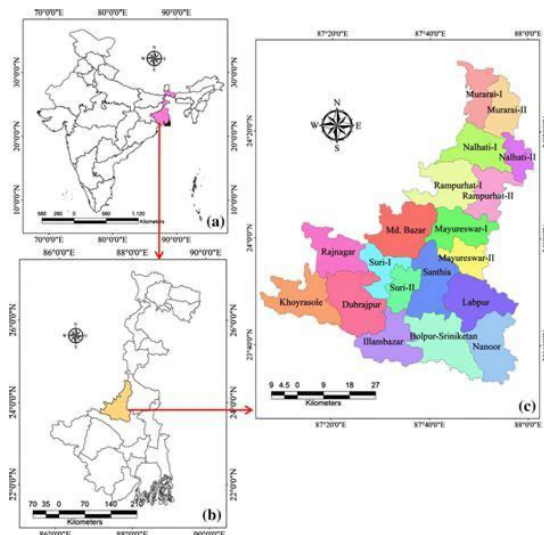
AI-generated recommendations, ease of interaction (e.g., via text or voice), and any challenges encountered during real-time use. Interviews will also explore suggestions for improving the tool's design and implementation. The IDIs will be conducted using a semi-structured guide, audio-recorded with consent, and thematically analyzed to inform future adaptation and scale-up of the intervention.

## IV. Study Setting

The study will be implemented in 2 sites in the states of Chhattisgarh and West Bengal.

### Site 1: Nagari Village, Suri-I Block, Birbhum District, West Bengal

Nagari is a rural village in Suri-I block of Birbhum district with a population of 1,959 across 396 households as per the 2011 Census. The population is predominantly Bengali speaking, with 61.9% literacy (63.7% male; 60.3% female) (*Nagari Village Population - Suri - I - Birbhum, West Bengal, n.d.*). The village exhibits a balanced gender ratio (~1,102 females per 1,000 males) and includes substantial Scheduled Caste (49.5%) and Scheduled Tribe (27.8%) communities. Nagari relies on a nearby sub-center for primary care, with higher-tier facilities located ~10 km away in Suri (PHC and district hospital) . Most residents engage in agriculture or informal labor, with basic mobile access. This setting—with limited local clinical capacity and frontline nurse responsibility—is suitable for evaluating the usability and acceptability of nurse-delivered, AI-assisted clinical tools in a resource-constrained rural environment.

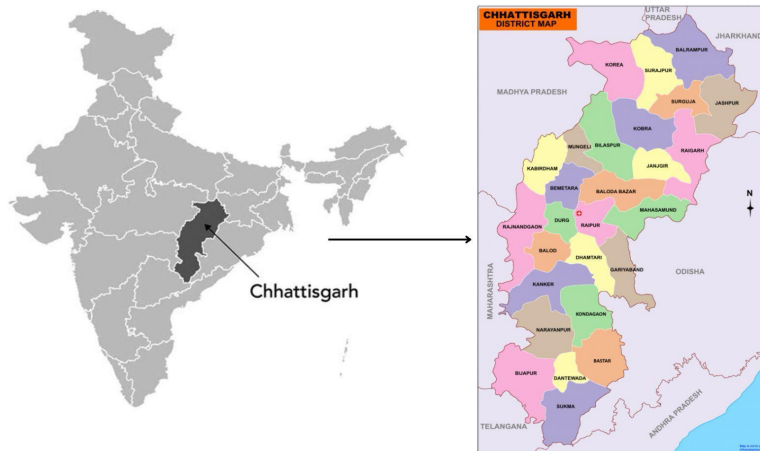


### Site 2: Ambikapur, Surguja District, Chhattisgarh

Ambikapur is the district headquarters of Surguja (predominantly rural ~90%) in northern Chhattisgarh and serves as a center for a largely tribal and rural catchment population. It

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is a regional referral hub for over 1,700 villages, many with bare minimum health infrastructure. (Ambikapur Metropolitan Urban Region Population 2011-2025 Census, n.d.) The health system is supported by ASHAs, ANMs, and nurses, who play a vital role in frontline care. While Ambikapur has high literacy rates (~88%) many healthcare interactions still rely on in-person triage and verbal communication. Patients will be enrolled in 3 clinics - namely, Amgasi village clinic, Argoti village clinic and Kuniya village clinic located 30 km, 60km and 50km from Ambikapur, respectively. These clinics are in rural and remote parts of the districts away from the district headquarters.



## V. Study Population

### A. Primary objective

Inclusion criteria:

Criteria	Hypertension	Diabetes Mellitus	Fever	Musculoskeletal pain	Breathlessness
Age	>18 years	>18 years	>18 years	>18 years	>18 years
Duration of condition / symptom	Known diagnosis	Known diagnosis OR HbA1C > 6.4 OR fasting blood sugar >126 OR PP >200			
Significance of complaint	If presented as chief complaint or in combination with DM	If presented as chief complaint or in combination with Hypertension	If presented as chief complaint and/or in combination with fever and	If presented as chief complaint only and no evidence of fever	If presented as chief complaint only and no evidence of fever



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			breathlessness		
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Exclusion criteria: Individuals who don't have the ability to provide informed consent due to lack of cognitive capacity (e.g. dementia, mental retardation, etc.).

Acutely sick patients - Systolic Blood Pressure <90mmhg, SpO2 <92%, Respiratory rate >22/min

Samples size

We powered this single-session, counter-balanced, within-participant study to detect an absolute two-sided difference of  $\pm 3.5\%$  in the consultation score between the intervention (nurse + LLM) and control (standard of care consultation by doctor). Assuming a within-subject design variance term derived from Goh et al., an intraclass correlation (ICC) of 0.10, two-sided  $\alpha$  of 0.05, 80% power, and 5% dropout, the sample size across both sites for each clinical outcome is 336 (Goh et al., 2024).

Site	Clinical management (Hypertension & Diabetes Mellitus)	Clinical reasoning (Fever, joint pain, breathlessness)	Total
Ambikapur	168	168	336
Birbhum	168	168	336
Total			672

Recruitment will be block-randomized equally between sites and sequences.

## 1. Note: Sample size correction after pilot data

A 30-patient internal pilot (15 per outcome) will be analyzed with a linear mixed-effects model that treats intervention, order (first vs second consultation), and site (study location) as fixed effects, and random intercepts will be included for each patient and for each doctor and nurse. We will extract the residual variance and random effect variances and use the *simr* package to re-estimate power for the planned sample size. The research team will inform the IRB if adjustments > 10% to the sample is required.

## B. Secondary objective I

Inclusion criteria: Only enrolled patients who can fill out / respond to a tablet-based exit survey in English / Hindi / Bengali.

Sample size: All patients who have participated in both the intervention and control will be asked to complete the exit survey ~ 672 patients. A group of 30 to 40 patients (15 to 20 in each site) who have completed the consultations in both study arms will be



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conveniently sampled to participate in the patient IDIs until we reach information saturation.

## C. Secondary objective II

Inclusion criteria: Nurses who have done at least 10 patient consults using the LLM tool. Sample size: 6 to 8 nurses who will do the consults across the 2 sites over the life of the project.

## VI. Study Procedures

Recruitment: On arrival at the clinic, prospective participants will be screened by a nurse who will measure the blood pressure, blood sugar levels, temperature, and take an oral history of the reason for the visit. This is the existing history-taking procedure at the clinic sites. Patients who meet the inclusion criteria for any of the 2 conditions or 3 symptoms will be offered the opportunity to enroll in the study.

Informed consent: A research assistant will explain the objectives of the study, expectations from the participant – 1. to devote extra time to this visit as they would be seen by 2 providers (doctor and nurse + LLM) and 2. fill out an exit survey, and the incentive available for the participant if they fulfil the requirements of the study. The research assistant will also review other aspects of informed consent with the patient (e.g. confidentiality, data reporting, etc.). Patients who agree to participate in the study will sign an informed consent form. The processes for informed consent will be done in the local language.

Randomization: Upon enrolment, the patient will be assigned to study sequence A or B, as per a computer-generated randomization sequence.

- Sequence A (Nurse + LLM → Doctor): Participants receive the intervention first, followed by control.
- Sequence B (Doctor → Nurse + LLM): Participants receive control first, followed by intervention.

## VII. Data Collection and Management

### Data Collection

Quantitative: Data for quantitative analysis will be collected for primary objective and secondary objective I.

Primary objective: The nurse + LLM – patient conversation will be audio recorded via a voice recording device. After taking the patient history, the nurse will enter the details into the LLM platform and carry out a multi-turn conversation with the LLM tool, seeking answers or clarifications from the patient, as required. Transcripts from the conversation and the LLM's recommendation will be retrieved. Similarly, the doctor – patient conversations will be audio – recorded and a summary sheet with the differentials,

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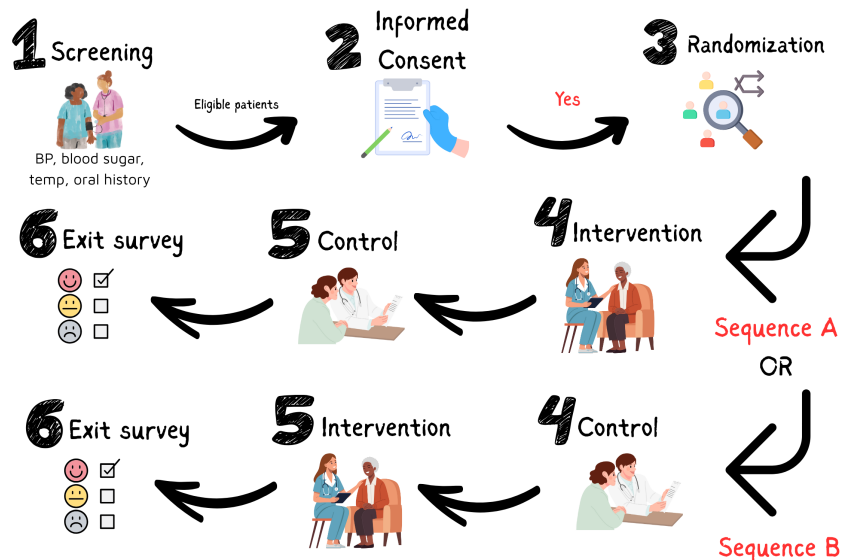
diagnosis and recommendations will be filled out for each patient by the doctor. Outputs for each patient will be assigned a unique patient ID. Each patient will be associated with 4 data sources – 1. Nurse- LLM -patient conversation transcript 2. Nurse-LLM generated prescription 3. doctor-patient conversation transcript and 4. Doctor's prescription.

Secondary objective I: Upon completion of the nurse-LLM -patient consult, the participants will be asked to complete a short, 10-question exit survey about their experience and perceptions of the consult. The survey will be administered through a digital platform such as Qualtrics/ Survey Monkey and will be available in both Bengali and Hindi. We will not collect any personal identifiable details such as name or telephone number in the survey. The raw data will be retrieved in the form of .xls or .csv files and stored in a password protected cloud-storage drive.

**Note:** Participant compensation: All patients enrolled in the study who complete all study activities (1 consult each with the doctor and nurse + LLM, and the patient exit survey) will receive a compensation of INR 250 in acknowledgment of their time spent in participating in the study.

See figure 1 for study flow:

## Study Flow Diagram



Qualitative: In-depth interviews with a select group of patients will be conducted using a semi-structured interview guide. A convenient sample of respondents will be approached for participating in the patient IDIs. The interviewer will meet with the respondents in a semi-private location within 1 to 2 days of the clinic visit to complete the interview. Each patient IDI will last for 30 to 45 minutes. The patient IDIs will be conducted in either Bengali or Hindi, as per the respondent's choice.

**Note:** An additional INR 250 will be given as compensation to the patients who participate in the IDIs.

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The IDIs with nurses will take 45 to 60 minutes and will be conducted in English or the participant's preferred local language (Bengali / Hindi) in a mutually agreed semi-private setting. The guide will focus on exploring questions about the comfort and usability of the AI tool, enablers and barriers of using an AI tool in a patient consult, willingness to integrate the tool in regular practice, and suggestions for improving the user experience. All interviews will be audio recorded and transcribed using software.

## Data Management

### 1. Data collection tools and formats

The study will generate both quantitative and qualitative data across its three objectives. Data sources will include:

- Audio recordings and transcripts of nurse–LLM and doctor–patient consultations.
- Prescriptions and treatment plans generated by the nurse–LLM interface and the attending doctor.
- Responses from a structured, digital patient exit survey.
- Transcripts of in-depth interviews (IDIs) with participating patients and nurses.

All quantitative data will be collected using structured tools and stored in spreadsheet formats (.xls or .csv). Audio recordings will be transcribed using secure software, and qualitative interview transcripts will be exported as text documents.

### 2. De-identification and confidentiality

Each patient will be assigned a unique ID to link data across sources while ensuring anonymity. Personally identifiable information (PIIs) will not be recorded in transcripts, prescriptions, or survey responses. Transcription files will be reviewed and cleaned of any inadvertent identifiers. Names and other identifiers will be removed from audio and text data prior to analysis.

### 3. Data storage and security

All data will be stored in a secure, cloud-based storage system with restricted access. Access will be password protected and limited to designated members of the study team. Audio recordings, transcripts, and survey data will be stored in separate folders according to data type and collection site. Regular backups will be scheduled to prevent data loss.

### 4. Data access and oversight

Only authorized research team members will have access to identifiable data during initial processing. De-identified datasets will be shared with data analysts and physicians involved in scoring, with strict adherence to confidentiality agreements. All team members will be trained on data handling and privacy protocols in accordance with institutional ethics guidelines.

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## 5. **Data retention and destruction**

All data will be retained securely for a period of five years following the completion of the study, in line with institutional policy and national research standards. After this period, all data will be permanently deleted from storage systems. Audio recordings will be deleted after transcription and quality control are completed, unless retention is necessary for verification.

## 6. **Data sharing and publication**

No individual-level data will be shared outside the research team. Findings will be reported in aggregate form, and any direct quotes from nurse interviews will only be included in publications or dissemination materials with explicit permission from the participants. Data sharing with external parties (e.g., journals or funders) will comply with institutional and legal guidelines, always ensuring participant anonymity.

## VIII. **Outcomes and Measures**

### A. **Primary objective**

Two primary outcomes will be measured based on participant subgroups. The **management reasoning outcome** will be assessed among patients with a known diagnosis of hypertension or diabetes, while the **diagnostic reasoning outcome** will be evaluated among patients presenting with symptoms such as fever, breathlessness, or musculoskeletal pain. For both outcomes, each patient interaction—whether in the standard of care or intervention arm—will be scored by licensed physicians (evaluators) using pre-defined assessment criteria. Scores will range from 0% to 100%, representing the extent to which clinical decisions align with appropriate care standards.

### B. **Secondary objective I**

The patient exit survey is designed to assess key implementation outcomes of the AI-assisted, nurse-led care model from the patient perspective. The primary outcomes include perceived communication quality, trust and comfort with AI use, and overall acceptability and satisfaction. These will be measured using structured Likert-scale items adapted from validated tools, including the WHO Health System Responsiveness framework and the PSQ-18. Additional items explore willingness to receive similar care in the future, as a proxy for future acceptability. Quantitative responses will be analyzed using descriptive statistics and composite scores for key domains, while qualitative data will undergo thematic analysis to contextualize patient experience and expectations. The qualitative data will explore themes like those in the patient exit survey and will add contextual richness and nuance to the patients' views.

### C. **Secondary objective II**

The in-depth interviews with nurses are designed to assess their experience using an AI-enabled clinical decision support tool in routine patient care. The interviews will explore

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themes related to the feasibility of using the tool (such as ease of use, impact on workflow, and access to required resources), and its acceptability (including trust in recommendations, comfort during use, and willingness to continue use in the future). Interviews will also examine practical challenges, such as digital literacy, internet connectivity, and preferred modes of interaction (text or voice).

## IX. Analysis Plan

### A. Primary objective

Rubric-based grading:

Transcripts and treatment plans from nurse and doctor consults for every patient will be graded using a modified version of the framework developed by Goh et al, which is a 19-point scoring system. The scoring rubric used in Goh et al. assigns 1 point each for 3 differential diagnosis ( $1 \times 3 = 3$  points), 0-2 points for the rationale for supporting each diagnosis ( $2 \times 3 = 6$  points), and 0-2 points for rationale of opposing diagnosis ( $2 \times 3 = 6$  points). It also assigns 1 point for final diagnosis ( $1 \times 1 = 1$  point), and 1 point each for 3 next steps ( $1 \times 3 = 3$  points).

Our study will adapt this grading rubric to the implementation context, keeping in mind the high footfall and general rush at the clinic, whereby a lengthy scoring scheme may add undue burden on the physician. We will use the scoring rubric without the rationale for supporting or opposing the diagnosis. For the 3 symptoms (fever, musculoskeletal pain and breathlessness), our scoring rubric will have 1 point each for 3 differential diagnosis ( $1 \times 3 = 3$  points), 2 points for final diagnosis ( $2 \times 1 = 2$  points), and 1 point each for 5 next steps ( $1 \times 5 = 5$  points). For each of the 5 next steps, negative 1 point will be assigned for harmful steps, 0 for inconsequential step and 1 positive points for correct step. The maximum possible score for the symptoms is 10 points.

For the 2 known diagnoses (hypertension and DM), we have a 7-point scoring system. Maximum 2 points will be awarded for review of data ( $2 \times 1 = 2$  points). The other possible scores are 0 and 1. Maximum 2 points will be awarded for screening of complications ( $2 \times 1 = 2$  points). The other possible scores for this criterion are 0 and 1. 1 point each will be awarded for medication compliance assessment ( $1 \times 1 = 1$  point), counselling provision ( $1 \times 1 = 1$  point), and treatment plan ( $1 \times 1 = 1$  point). Negative 1 point will be awarded each for improper counseling and inadequate treatment plan.

Each transcript and treatment plan will be graded by 2 assessors, who will be physicians with an MD degree in Internal medicine and have at least 7 years of clinical practice experience. The transcripts and treatment plan will be randomly assigned to the graders, and they will be blinded to each other's assessments.

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The primary analysis will use the same mixed-effects model on all randomized patients with score for both intervention and SoC consultations. The null hypothesis

$$H_0: \mu_{\{Nurse+AI\}} - \mu_{\{Doctor\}} = 0$$

will be tested with a two-sided 95% confidence interval. We will report the point estimate, CI, P-value, and intraclass correlations. Sensitivity analyses will repeat the model without provider random effects and with robust standard errors.

## B. Secondary objective I

The analysis of the patient exit survey will focus on quantitative outcomes derived from Likert scale and categorical items grouped into predefined thematic domains: communication and understanding (Q1–3), trust and comfort with AI use (Q4–5), and respect and satisfaction (Q6–8). Descriptive statistics will be used to report frequencies, percentages, means, and standard deviations for each item. Where appropriate, composite domain scores will be calculated by averaging responses within each domain, and internal consistency will be assessed using Cronbach’s alpha. Responses to yes/no and categorical questions (e.g., willingness to receive similar care again) will be summarized using proportions. See the survey tool for more details on the questions. For the patient qualitative data, we will use an abductive approach for coding the transcripts using Dedoose, a collaborative qualitative analysis software (*Abductive Coding in Qualitative Research*, 2025). A codebook will be initially developed based on *a priori* assumptions and will be further refined after inductively coding three transcripts. This finalized codebook will then be applied to all transcripts for coding and analysis.

## C. Secondary objective II

The analysis for the IDIs with nurses will follow the same approach as described above for the IDIs with patients. The initial codebook will be based on *a priori* assumptions for the interviews with nurses and iteratively refined through inductive coding.

## X. Ethical Considerations

### Informed Consent

Written informed consent will be obtained from all participants before enrollment. A trained research assistant will explain the objectives of the study, study procedures, the expectations from the participant and the financial reimbursement to be offered as a gesture for the participant’s time. The participant will also be briefed on their right to withdraw at any point in the study, the steps taken to ensure confidentiality of the information collected as part of the study and the risks (which are minimal) of participating. For those who consent, a signature / thumb impression and the date will be recorded in the consent form. The verbal explanation of the consent process and the forms will be available in both Hindi and Bengali – the local languages spoken in the

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study sites. A separate signed consent will be obtained for the small group of patients selected for the IDIs.

Doctors and nurses will also be asked to consent for their participation in the study. Both forms will elaborate on the purpose and objectives of the study, the expectations from the individuals, confidentiality issues, and their right to voluntary withdraw from the study. For the nurses, the same consent form will also cover their participation in an in-depth interview which will last for 45 to 60 minutes. Signatures will be collected for all consenting doctors and nurses. These consent forms will be in English.

## XI. Study Risks

This study involves minimal risk to participants. The following potential risks have been identified, along with corresponding mitigation strategies:

### 1. Breach of confidentiality

**Risk:** The study involves collection of audio recordings and clinical data, which could lead to unintended disclosure of personal health information.

**Mitigation:** All data will be de-identified prior to transcription and analysis. Unique participant IDs will be used in place of names or other identifiers. Files will be stored in a password-protected, encrypted cloud-based system with access limited to authorized members of the research team.

### 2. Discomfort due to audio recording

**Risk:** Patients, doctors, or nurses may feel uncomfortable being audio recorded during clinical consultations or interviews.

**Mitigation:** Participation in audio recording is entirely voluntary. During the informed consent process, participants will be clearly informed about the purpose of the recordings, how they will be used, and the steps taken to protect their privacy. Participants may decline recording or withdraw at any time without penalty.

### 3. Disruption to clinical workflow

**Risk:** Dual consultations (doctor and nurse + AI) may extend visit time, disrupt routine clinic operations, or increase patient burden.

**Mitigation:** Study scheduling will be coordinated to avoid peak hours and minimize operational disruption. Participants will be informed of the additional time commitment during consent and compensated appropriately for their time.

### 4. Emotional or cognitive burden during nurse interviews



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**Risk:** Nurses may experience discomfort or fatigue during the in-depth interviews.

**Mitigation:** Participation in interviews is voluntary. Interviews will be conducted in a semi-private setting and will be scheduled at convenient times. Nurses may skip questions or terminate the interview at any point without consequence.

## 5. Over-reliance on AI recommendations

**Risk:** There is a possibility that nurses may depend too heavily on AI outputs, reducing their use of independent clinical judgment.

**Mitigation:** All participating nurses will be trained to use the AI tool strictly as a decision-support system. The AI model will be vetted for safety and usability in advance. Clinical supervision will be available during the implementation phase. It will also be reiterated to the patients that recommendations from nurse are for study purposes only - and that they should only follow the doctor's clinical advice.

## 6. Sequence effects and response bias

**Risk:** The order in which patients receive consultations (doctor first vs. nurse + LLM first) may influence their experience or survey responses.

**Mitigation:** Participants will be randomly assigned to one of two sequences. The exit survey will be administered immediately after the nurse + LLM consultation and will focus only on that experience. The analysis will control for consultation order to adjust for sequence effects. Survey language will be neutrally framed to avoid bias.

## XI. Timeline

Below is an abridged version of the timeline. See attached MS excel sheet for a detailed workplan by site.

Activities	Aug 2025	Sept	Oct	Nov	Dec	Jan 2026	Feb	Mar	Apr	Ma y
Protocol finalization & IRB submission	X									
Study team recruitment	X	X								
Curriculum development	X									

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<b>Training</b>		X	X							
<b>HCD workshop</b>				X						
<b>Pilot testing &amp; primary data collection</b>					X	X	X	X		
<b>Analysis, report writing</b>									X	X

### XII. Dissemination Plan

Findings from this study will be shared with key stakeholders to inform the responsible use of AI-assisted, nurse-led care in primary health settings. Local dissemination will include feedback sessions with participating nurses, clinic staff, and district health officials, where results will be presented in non-technical language and local translations where needed. Summary findings will also be shared with the State Health Department to support future planning and scale-up discussions. Broader dissemination will include presentations at academic and public health forums, and publication in peer-reviewed journals. All results will be reported in aggregate, with no individual- or facility-level identifiers. Participants will not be named in any dissemination materials. Any materials used for training or implementation improvements will be shared openly and credited appropriately. The dissemination process will prioritize respectful engagement with participants and health system partners and will uphold principles of confidentiality, transparency, and equitable knowledge sharing.

### XIII. Potential Benefits

While there is no direct clinical benefit guaranteed to participants, this study has the potential to generate significant benefits at the individual, health system, and policy levels. For patients, the study may enhance the quality of care received by enabling more structured and thorough consultations, particularly with AI-supported clinical reasoning. For nurses, the intervention offers an opportunity to build confidence in clinical decision-making with supportive technology, potentially improving job satisfaction and professional autonomy. At the health system level, the findings may inform scalable strategies for addressing provider shortages in rural and resource-limited settings by

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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empowering frontline workers with AI-enabled tools. More broadly, this study will contribute critical real-world evidence on the safety, usability, and acceptability of large language models in primary care delivery in LMIC settings—an area with limited existing research. These insights can guide future investments and policy decisions on responsible AI integration in healthcare.

## XIV. Limitations

This study has several limitations.

- i. First, as a clinic-based implementation study conducted in selected rural primary care settings, findings may not be generalizable to other regions or higher-level health facilities.
- ii. Second, the evaluation of clinical quality is based on physician-adjudicated scoring of recorded interactions, which, despite using standardized criteria, may introduce some subjectivity.
- iii. Third, while patient satisfaction is appropriately measured through self-report, there remains potential for social desirability bias, even with the use of tablet-based, self-administered surveys. Although this approach reduces interviewer influence and increases privacy, patients may still moderate their responses due to perceived surveillance or limited digital literacy.
- iv. Fourth, the in-depth interviews with nurses are qualitative and based on a small sample, which may not capture the full range of experiences and could be influenced by recall bias.
- v. Lastly, the study captures short-term implementation outcomes and does not assess long-term effectiveness, sustainability, or cost-effectiveness, which will require further research.

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## Annexure 1 – Grading rubric

### Patient Overview:

1. Age
2. Patient unique study ID -
3. Nurse ID -
4. Doctor ID -
5. Time spent in nurse encounter -
6. Time spent in doctor encounter -
7. Study Complaint - (If has more than 1, select multiple)
  - a. Diabetes
  - b. Hypertension
  - c. Breathlessness
  - d. Fever
  - e. Musculoskeletal Pain
8. Any system challenges due to internet or electricity (Yes/No)

### Grader Sheet for symptoms (Fever, Breathlessness, Musculoskeletal pain)

#### Evaluation of nurse + LLM – patient encounter

S/N	Criteria	S/N	Criteria
1.	Differential Dx 1 a. 0 b. 1	6.	Next Step 2 a. -1 b. 0 c. 1
2.	Differential Dx 2 a. 0 b. 1	7.	Next step 3 a. -1 b. 0 c. 1
3.	Differential Dx 3 a. 0 b. 1	8.	Next step 4 a. -1 b. 0 c. 1
4.	Final Diagnosis a. 0 b. 1 c. 2	9.	Next step 5 a. -1 b. 0 c. 1
5.	Next step 1 a. -1 b. 0 c. 1		

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## Evaluation of doctor – patient encounter

S/N	Criteria	S/N	Criteria
1.	Differential Dx 1 c. 0 d. 1	6.	Next Step 2 d. -1 e. 0 f. 1
2.	Differential Dx 2 c. 0 d. 1	7.	Next step 3 d. -1 e. 0 f. 1
3.	Differential Dx 3 c. 0 d. 1	8.	Next step 4 d. -1 e. 0 f. 1
4.	Final Diagnosis d. 0 e. 1 f. 2	9.	Next step 5 d. -1 e. 0 f. 1
5.	Next step 1 d. -1 e. 0 f. 1		

## Grader Sheet for Disease (Diabetes and Hypertension)

### Evaluation of nurse + LLM – patient encounter

S/N	Criteria	S/N	Criteria
1.	For diabetes and hypertension - Review of data a. 0 b. 1 c. 2	4.	Counselling provided a. -1 b. 0 c. 1
2.	Screened for complications of the disease d. 0 e. 1 f. 2	5.	Treatment plan appropriate a. -1 b. 0 c. 1
3.	Medication compliance assessed g. 0		



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	h. 1		
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### Evaluation of doctor – patient encounter

S/N	Criteria	S/N	Criteria
1.	For diabetes and hypertension - Review of data a. 0 b. 1 c. 2	4.	Counselling provided a. -1 b. 0 c. 1
2.	Screened for complications of the disease a. 0 b. 1 c. 2	5.	Treatment plan appropriate a. -1 b. 0 c. 1
3.	Medication compliance assessed a. 0 b. 1		

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## **Annexure – 2 – Patient exit survey**

This survey is designed to assess your experience with today's visit. Your responses will help us improve care.

### **Section A: Communication and Understanding**

1. The nurse understood my health problem clearly and followed up with questions adequately.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

2. I understood the advice or next steps given to me.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

3. I had enough time to ask questions.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

### **Section B: Trust and Comfort with AI Use**

4. I was comfortable that the nurse used a computer or phone to assist my care. (Nong & Platt)

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

5. I trust the recommendations given during the visit.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

### **Section C: Respect and Satisfaction**

6. I felt respected during the visit.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

7. I am satisfied with the care I received today.

☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Unsatisfied ☐ Very unsatisfied

8. I would be willing to receive care like this again.

☐ Yes ☐ Maybe ☐ No

### **Section D: Open Feedback (Optional)**

9. What did you like most about the visit?

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10. How could we improve your experience?

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# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

## Annexure – 2.1 – Patient exit survey (Bengali)

### রোগী মতামত ফর্ম – নার্স + কম্পিউটার সহায়তায় চিকিৎসা

সময় লাগবে: ৫ মিনিটের কম

এই ফর্মটি আজকের আপনার চিকিৎসা অভিজ্ঞতা সম্পর্কে জানতে চায়। আপনার মতামত আমাদের চিকিৎসা পদ্ধতি আরও ভালো করতে সাহায্য করবে।

#### অংশ A: কথা বলা ও বোঝার অভিজ্ঞতা

1. ১। নার্স আমার সমস্যাটা ভালোভাবে বুঝেছেন এবং প্রয়োজনীয় প্রশ্ন করেছেন।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত
2. ২। আমাকে যা বলা হয়েছে বা যেভাবে পরবর্তী ধাপ বোঝানো হয়েছে, আমি তা বুঝতে পেরেছি।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত
3. ৩। আমার নিজের প্রশ্নগুলো জিজ্ঞাসা করার মতো সময় আমি পেয়েছি।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত

#### অংশ B: কম্পিউটার ব্যবহারে আস্থা ও স্বস্তি

4. ৪। নার্স আমার চিকিৎসায় মোবাইল বা কম্পিউটার ব্যবহার করেছেন – এতে আমি স্বস্তি বোধ করেছি।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত
5. ৫। আজকের চিকিৎসায় যে পরামর্শ দেওয়া হয়েছে, আমি তার ওপর আস্থা রাখতে পারছি।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত

#### অংশ C: সম্মান ও সন্তুষ্টি

6. ৬। চিকিৎসার সময় আমি সম্মানিত অনুভব করেছি।  
☐ পুরোপুরি একমত ☐ একমত ☐ না একমত, না অমত ☐ অমত ☐ পুরোপুরি অমত
7. ৭। আজকের চিকিৎসায় আমি সন্তুষ্ট।  
☐ খুবই সন্তুষ্ট ☐ সন্তুষ্ট ☐ মোটামুটি ☐ অসন্তুষ্ট ☐ একেবারে অসন্তুষ্ট
8. ৮। আমি ভবিষ্যতে এমন চিকিৎসা নিতে আগ্রহী।  
☐ হ্যাঁ ☐ হয়তো ☐ না

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### অংশ D: আপনার মতামত (ঐচ্ছিক)

৯। আপনার আজকের দেখায় সবচেয়ে ভালো লাগার বিষয় কী ছিল?

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১০। আমরা কীভাবে আপনার অভিজ্ঞতা আরও ভালো করতে পারি?

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## Annexure – 2.2 – Patient exit survey (Hindi)

### रोगी सर्वे फॉर्म – नर्स + कंप्यूटर सहायता से की गई देखभाल

समय: लगभग 5 मिनट लगेंगे

इस सर्वे का उद्देश्य आज की आपकी विज़िट का अनुभव जानना है। आपके जवाब हमें सेवा सुधारने में मदद करेंगे।

#### सेक्शन A: बातचीत और समझ

- नर्स ने मेरी बीमारी को अच्छे से समझा और मुझसे ज़रूरी सवाल पूछे।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ
- मुझे जो सलाह या आगे क्या करना है, वो अच्छी तरह समझ में आया।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ
- मुझे अपने सवाल पूछने के लिए पर्याप्त समय मिला।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ

#### सेक्शन B: कंप्यूटर / मोबाइल से इलाज में भरोसा और सहजता

- नर्स ने मेरे इलाज में कंप्यूटर या मोबाइल का इस्तेमाल किया, इससे मुझे कोई परेशानी नहीं हुई।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ
- मुझे जो सलाह दी गई, उस पर मुझे भरोसा है।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ

#### सेक्शन C: सम्मान और संतुष्टि

- इस विज़िट के दौरान मुझे पूरा सम्मान मिला।
  - ☐ पूरी तरह सहमत हूँ ☐ सहमत हूँ ☐ निश्चित नहीं हूँ ☐ असहमत हूँ ☐ बिल्कुल असहमत हूँ
- आज मुझे जो देखभाल मिली, उससे मैं कितना संतुष्ट हूँ:
  - ☐ बहुत संतुष्ट ☐ संतुष्ट ☐ ठीक-ठाक ☐ असंतुष्ट ☐ बिल्कुल असंतुष्ट
- क्या आप भविष्य में भी इसी तरह की देखभाल लेना चाहेंगे?
  - ☐ हाँ ☐ शायद ☐ नहीं

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### सेक्शन D: खुली प्रतिक्रिया (वैकल्पिक)

9. आज की विज़िट में आपको सबसे अच्छा क्या लगा?

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10. हम आपकी सेवा को और बेहतर कैसे बना सकते हैं?

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## **Annexure 3 – In-depth interview guide for patients**

### **In-Depth Interview Guide: Patient Experience with Nurse + AI Consultation**

Estimated Duration: 30–45 minutes

Purpose: To explore in greater depth how patients perceived the nurse-led consultation assisted by an AI tool. This includes their understanding, trust, comfort, and overall acceptability of this new model of care.

#### **Section 1: Introduction**

Thank you for agreeing to speak with us today. This interview is about your experience during your recent visit to the clinic. Your responses will help us improve how nurses and technology work together to provide better care. Everything you say will remain confidential, and your name will not be used in any reports. You can choose to skip any question or stop the interview at any time. Do you have any questions before we start?

#### **Section 2: Communication and Understanding**

1. What was the reason for your clinic visit today?
2. How well did the nurse seem to understand your problem?
  - a. Did the nurse ask you enough questions?
3. How was the counseling you received from the nurse?
  - a. Were the next steps or advice adequately explained to you?
  - b. Did the nurse answer your questions in a way that you could understand?
4. Did you feel like you had enough time to ask your questions?
  - a. Were any medical words or terms used that were hard to follow?

#### **Section 3: Comfort and Trust with AI Tool**

5. During your consultation, you may have noticed the nurse using a mobile phone or computer. How did you feel about that? Please explain
  - a. Did the nurse tell you why they were using the device?
6. Did the use of the phone/computer make you more confident or more unsure of the clinical counseling you received from the nurse?
  - a. Did you feel that the care or advice was different because a computer tool was being used?
7. In your opinion, did you feel the tool helped or got in the way of the clinical consultation?
  - a. Do you think the nurse's time spent in talking with you was affected because of presence of a phone or computer?
  - b. If it was affected, was it a positive or negative effect? Please elaborate.



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## **Section 4: Respect, Satisfaction, and Acceptability**

8. How did you feel you were treated during the visit?
  - a. Did you feel listened to and respected?
  - b. Overall, how satisfied were you with the care you received?
9. Would you feel comfortable coming back for a clinical visit like this (with a nurse + AI tool) again?
10. Would you recommend this kind of care to a friend or family member?

## **Section 5: Open Feedback and Suggestions**

11. What did you like most about your visit today?
12. Was there anything you didn't like or found confusing?
13. How could we improve this type of care in the future?
  - a. If we used this tool in more clinics, what would you want us to keep the same or change?

## **Section 6: Closing**

Thank you very much for your time and feedback. We appreciate your help in making healthcare better for everyone.

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

## **Annexure – 3.1 – In-depth interview guide for patients (Bengali)**

গভীর সাক্ষাৎকার নির্দেশিকা: নার্স + AI সহ রোগীর অভিজ্ঞতা

সময়কাল: আনুমানিক ৩০-৪৫ মিনিট

উদ্দেশ্য: নার্স এবং AI টুলের সাহায্যে হওয়া চিকিৎসা পরামর্শ কেমন ছিল, রোগীরা কীভাবে তা বুঝেছে, বিশ্বাস করেছে, স্বস্তি অনুভব করেছে – এই সব জানার জন্য।

ধারাবাহিক অংশ:

### ১. পরিচিতি

আজ আমাদের সঙ্গে কথা বলার জন্য ধন্যবাদ। এই সাক্ষাৎকার আপনার ক্লিনিকে আসার অভিজ্ঞতা নিয়ে। আপনার মতামত আমাদের সাহায্য করবে নার্স এবং প্রযুক্তিকে একসাথে ব্যবহার করে আরও ভালো পরিষেবা দিতে। আপনার সমস্ত উত্তর গোপন রাখা হবে। আপনি যেকোনো প্রশ্ন এড়িয়ে যেতে পারেন বা যেকোনো সময় সাক্ষাৎকার বন্ধ করতে পারেন।

শুরু করার আগে কোনো প্রশ্ন আছে কি?

### ২. যোগাযোগ এবং বোঝাপড়া

- আপনি আজ ক্লিনিকে কেন এসেছিলেন?
- নার্স কি আপনার সমস্যা বুঝেছিলেন বলে মনে হয়েছে?
- নার্স কি আপনাকে পর্যাপ্ত প্রশ্ন করেছিলেন?
- নার্স যে পরামর্শ দিয়েছেন তা কি আপনি বুঝতে পেরেছেন?
- আপনি কি নিজের প্রশ্ন করতে সময় পেয়েছেন?
- কোনো মেডিকেল শব্দ কি বুঝতে অসুবিধা হয়েছে?

### ৩. AI টুল নিয়ে স্বস্তি ও বিশ্বাস

- নার্স যদি মোবাইল বা কম্পিউটার ব্যবহার করেন, তাহলে আপনি কেমন অনুভব করেছিলেন?
- নার্স কি আপনাকে জানিয়েছেন কেন ডিভাইস ব্যবহার করছেন?
- AI ব্যবহারে আপনার বিশ্বাস বেড়েছে না কমেছে?
- এই টুল ব্যবহারে পরামর্শ বা পরিষেবায় কোনো পার্থক্য মনে হয়েছে কি?
- টুলটি কি সাহায্য করেছে, না কি ব্যাঘাত ঘটিয়েছে বলে মনে হয়েছে?
- নার্স কি যথেষ্ট সময় দিতে পেরেছেন, না কি ফোন/কম্পিউটার ব্যবহারে সময় কম পেয়েছেন?
- যদি কম পেয়ে থাকেন, তাহলে সেটা ভালো না খারাপ হয়েছে বলে মনে হয়েছে?

### ৪. সম্মান, সন্তুষ্টি এবং গ্রহণযোগ্যতা

- এই ভিজিটে আপনি কেমন অনুভব করেছেন?
- আপনি কি মনে করেন আপনাকে সম্মান দেওয়া হয়েছে?
- আপনি কি চিকিৎসায় সন্তুষ্ট?
- ভবিষ্যতে আবার এইরকম নার্স + AI সেবা নিতে চাইবেন?

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- আপনি কি এই পরিষেবাটি বন্ধুবান্ধব বা পরিবারের সদস্যদের সুপারিশ করবেন?

৫. থোলা মতামত ও পরামর্শ

- আজকের ভিজিটে আপনার সবচেয়ে ভালো লেগেছে কোনটা?

- এমন কিছু কি ছিল যা আপনি বোঝেননি বা পছন্দ করেননি?

- ভবিষ্যতে এই পরিষেবা কীভাবে উন্নত করা যায়?

- যদি এই টুল আরও ক্লিনিকে ব্যবহৃত হয়, তাহলে কোন জিনিস অপরিবর্তিত রাখা উচিত আর কী পরিবর্তন দরকার?

৬. সমাপ্তি

আপনার সময় ও আন্তরিক মতামতের জন্য অনেক ধন্যবাদ। এটি সকলের জন্য স্বাস্থ্যসেবা আরও ভালো করতে সাহায্য করবে।

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## **Annexure – 3.2 – In-depth interview guide for patients (Hindi)**

गहन साक्षात्कार मार्गदर्शिका: नर्स + AI परामर्श के साथ मरीज का अनुभव

अनुमानित समय: 30–45 मिनट

उद्देश्य: यह समझना कि मरीजों ने नर्स और AI टूल की मदद से की गई परामर्श को कैसे अनुभव किया – उनकी समझ, विश्वास, आराम और इस देखभाल मॉडल की स्वीकृति के बारे में।

अनुभाग 1: परिचय

धन्यवाद, आपने हमसे बात करने के लिए समय निकाला। यह बातचीत आपके हाल के क्लिनिक विज़िट के अनुभव के बारे में है। आपकी बातें हमें नर्स और तकनीक के साथ मिलकर बेहतर सेवा देने में मदद करेंगी। आपकी पहचान गोपनीय रखी जाएगी और आपका नाम किसी रिपोर्ट में नहीं आएगा। आप किसी भी सवाल का जवाब देने से मना कर सकते हैं या जब चाहें बातचीत रोक सकते हैं।

क्या शुरू करने से पहले आपके कोई सवाल हैं?

अनुभाग 2: संवाद और समझ

- आप आज किस वजह से क्लिनिक आए थे?
- क्या नर्स ने आपकी समस्या को अच्छे से समझा?
- क्या नर्स ने आपसे पर्याप्त सवाल पूछे?
- नर्स ने आपको जो समझाया, क्या वह ठीक से समझ में आया?
- क्या आपकी बातों को ध्यान से सुना गया?
- क्या आपके पास अपने सवाल पूछने के लिए समय था?
- क्या किसी मेडिकल शब्द को समझने में कठिनाई हुई?

अनुभाग 3: AI टूल के साथ आराम और विश्वास

- परामर्श के दौरान आपने नर्स को मोबाइल या कंप्यूटर इस्तेमाल करते देखा होगा। इससे आपको कैसा महसूस हुआ?
- क्या नर्स ने बताया कि वह मोबाइल/कंप्यूटर क्यों इस्तेमाल कर रही हैं?
- क्या इस तकनीक के उपयोग से आपकी नर्स की सलाह पर विश्वास बढ़ा या घटा?
- क्या आपको लगा कि AI टूल से सलाह या इलाज में कुछ बदलाव आया?
- क्या आपको लगा कि यह टूल मददगार था या उलझन पैदा कर रहा था?
- क्या नर्स आपके साथ पर्याप्त समय बिता पाई, या फोन/कंप्यूटर की वजह से समय कम मिला?
- अगर फर्क पड़ा, तो वह अच्छा था या बुरा? कृपया समझाएं।

अनुभाग 4: सम्मान, संतुष्टि और स्वीकार्यता

- आपको इस परामर्श के दौरान कैसा महसूस हुआ?

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- क्या आप महसूस करते हैं कि आपकी बात सुनी गई और सम्मान मिला?
- क्या आप आज की सेवा से संतुष्ट हैं?
- क्या आप दोबारा इस तरह की नर्स + AI सेवा लेना चाहेंगे?
- क्या आप अपने परिवार या दोस्तों को यह सेवा लेने की सलाह देंगे?

### अनुभाग 5: सुझाव और खुला फीडबैक

- आज की विज़िट में आपको सबसे अच्छा क्या लगा?
- क्या कोई बात थी जो आपको समझ नहीं आई या पसंद नहीं आई?
- भविष्य में इस सेवा को बेहतर कैसे बनाया जा सकता है?
- अगर यह टूल और क्लिनिक में इस्तेमाल हो, तो आप क्या चीज़ वैसी ही रखना चाहेंगे और क्या बदलवाना चाहेंगे?

### अनुभाग 6: समाप्ति

आपका बहुत धन्यवाद कि आपने समय निकाला और ईमानदारी से अपनी राय दी। यह हमारी सेवा को बेहतर बनाने में मदद करेगा।

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## **Annexure – 4 – In-depth interview guide for nurses**

Title: In-depth interview guide for assessing the perceptions & acceptability of AI tool use by nurses in primary health care settings in rural India.

### **Icebreaker**

1. How long have you been a nurse? Where did you work prior to this project?
2. How many patients have you seen during this project?
3. How has the experience been?

### **Training**

4. You received training on medicine-specific topics and digital literacy prior to the start of the project. What is your opinion on the training material?
  - a. Did you feel enough time was spent on medical literacy? How can it be made better?
  - b. What is your opinion on the depth of teaching done for digital literacy? What changes should be made?
  - c. What was your opinion about the training material ? Was it easy to follow?  
Please elaborate.
5. How was the teaching? Were you able to follow the language used?
6. How do you feel about the frequency of classes / sessions? Should it be changed? If yes, what should the change be?
7. The trainings were delivered to you online. How was your experience with online learning?
  - a. Did the sessions allow you sufficient opportunity to ask questions?
8. What suggestions do you have to improve the training experience ?

### **Feasibility**

9. You used an AI tool to see patients. You spoke to both the patient and the AI tool during the consult. How comfortable were you with this process?
  - a. Were you able to use the tool with patients without major interruptions? How did it alter your workflow?
10. Would you rate the AI tool as an enabler or hindrance to your workflow? Please elaborate.

### **Acceptability**

11. How did you feel using the AI tool during patient care?
12. Do you trust the recommendations it gave?
13. If there was an option to permanently integrate a similar tool in your daily work where you could see patients for common conditions and complaints, would you want to continue doing it?

### **Practical considerations**

14. You communicated with the AI tool through text/ voice/ both. How was your experience using these modalities?

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- a. How can it be improved? Single mode? Voice or text only?
- 15. Did internet connection affect the smoothness of your workflow?
  - a. If yes, how was your work affected?

### Learnings

- 16. If you had to give 1 advice to the people who designed the nurse-AI intervention project, what would that be?



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## Annexure – 4.1 – In – depth interview guide for nurses (Bengali)

### গভীর সাক্ষাৎকারের গাইড

প্রকল্প: গ্রামীণ প্রাথমিক স্বাস্থ্য ব্যবস্থায় নার্সদের দ্বারা এআই টুল ব্যবহারের অভিজ্ঞতা, গ্রহণযোগ্যতা নিয়ে মূল্যায়ন

তারিখ: ১৫ জুলাই ২০২৫ | সংস্করণ: ১

#### Icebreaker

- 1) আপনি কতদিন ধরে নার্স হিসেবে কাজ করেছেন? এই প্রকল্পে যোগদানের আগে কোথায় কাজ করেছেন?
- 2) এই প্রকল্পে আপনি কতজন রোগী দেখেছেন?
- 3) আপনার অভিজ্ঞতা কেমন হয়েছে?

#### Training

- 4) এই প্রকল্প শুরুর আগে আপনাকে ওষুধ সংক্রান্ত এবং ডিজিটাল লিটারেসি নিয়ে training দেওয়া হয়েছিল। এই training বিষয়বস্তু নিয়ে আপনার কী মতামত?
  - a) আপনি কি মনে করেন মেডিকেল বিষয়ে যথেষ্ট সময় দেওয়া হয়েছিল? আরও ভালো করতে কী করা যেতে পারে?
  - b) ডিজিটাল লিটারেসি শেখানোর গভীরতা নিয়ে আপনার কী মতামত? কোনো পরিবর্তনের দরকার আছে কি?
  - c) Training উপকরণ কেমন ছিল? বোঝা কি সহজ ছিল? বিস্তারিত বলুন।
- 5) শেখানোর ধরণ কেমন ছিল? ভাষা বুঝতে পারতেন তো?
- 6) ক্লাস/সেশনের সংখ্যা নিয়ে আপনার কী অভিমত? পরিবর্তনের দরকার আছে কি? থাকলে কী পরিবর্তন হওয়া উচিত?
- 7) Training গুলো অনলাইনে হয়েছে। অনলাইন শেখার অভিজ্ঞতা কেমন ছিল?
  - a) আপনি কি প্রতিটি সেশনে প্রশ্ন করার যথেষ্ট সুযোগ পেয়েছেন?
- 8) এই training আরও উন্নত করতে আপনার কী পরামর্শ আছে?

#### Feasibility

- 9) আপনি রোগী দেখার সময় একটি এআই টুল ব্যবহার করেছেন এবং একই সময়ে রোগী ও টুলের সঙ্গে কথা বলেছেন। এই প্রক্রিয়ায় আপনার কেমন লেগেছে?
  - a) আপনি কি রোগীদের সঙ্গে কাজ করার সময় টুলটি নির্বিঘ্নে ব্যবহার করতে পেরেছেন? এটি কি আপনার কাজের ধরণ পরিবর্তন করেছে?

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- 10) আপনি কি মনে করেন এই এআই টুলটি আপনার কাজ সহজ করেছে না কি সমস্যার কারণ হয়েছে? বিস্তারিত বলুন।

### Acceptability

- 11) রোগীর যত্নে এই এআই টুল ব্যবহার করে আপনার কী অনুভূতি হয়েছে?
- 12) এটি যে সুপারিশগুলো দিয়েছে, আপনি কি সেগুলোর ওপর বিশ্বাস রেখেছেন?
- 13) যদি এই ধরনের টুল আপনার প্রতিদিনের কাজে স্থায়ীভাবে ব্যবহার করার সুযোগ থাকে, আপনি কি তা করতে আগ্রহী হবেন?

### Practical considerations

- 14) আপনি এই এআই টুলের সঙ্গে লেখা/কণ্ঠ/উভয় মাধ্যম ব্যবহার করে যোগাযোগ করেছেন। আপনার এই অভিজ্ঞতা কেমন ছিল?
- a) কীভাবে এটি আরও ভালো করা যেতে পারে? শুধু একটি মাধ্যম রাখা কি ভালো হবে? কণ্ঠ বা লেখা—কোনটি আপনার জন্য সহজ?
- 15) ইন্টারনেট সংযোগ কি আপনার কাজের গতি বা ধারায় সমস্যা তৈরি করেছে?
- a) যদি করে থাকে, কীভাবে আপনার কাজের উপর এর প্রভাব পড়েছে?

### Learnings

- 16) যদি আপনি এই নার্স-এআই প্রকল্প ডিজাইনকারী দলকে একটি পরামর্শ দিতে পারেন, আপনি কী বলবেন?

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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## Annexure – 4.2 – In – depth interview guide for nurses (Hindi)

### गहराई से साक्षात्कार गाइड

उद्देश्य: यह गाइड यह समझने के लिए है कि ग्रामीण भारत में प्राथमिक स्वास्थ्य सेवा में काम कर रही नर्सों AI टूल का उपयोग करने को लेकर क्या सोचती हैं, इसे अपनाने और आगे भी जारी रखने को लेकर उनकी क्या राय है।

दिनांक: 15 जुलाई 2025

संस्करण: 1

### परिचयात्मक सवाल (Icebreaker)

- आप कितने सालों से नर्स हैं? इस प्रोजेक्ट से पहले आपने कहाँ काम किया था?
- इस प्रोजेक्ट के दौरान आपने कितने मरीज देखे हैं?
- अब तक का अनुभव कैसा रहा?

### प्रशिक्षण से जुड़े सवाल

- आपको इस प्रोजेक्ट से पहले दवाओं से संबंधित और डिजिटल ट्रेनिंग दी गई थी। आपको उस ट्रेनिंग के बारे में क्या लगा?
- क्या आपको लगता है कि मेडिकल विषयों पर पर्याप्त समय दिया गया? इसे बेहतर कैसे बनाया जा सकता है?
- डिजिटल विषयों की ट्रेनिंग कैसी थी? क्या कुछ सुधार किया जा सकता है?
- आपको ट्रेनिंग सामग्री कैसी लगी? क्या समझना आसान था? कृपया विस्तार से बताएं।
- पढ़ाने का तरीका कैसा था? क्या आप भाषा ठीक से समझ पा रही थीं?
- क्लासेस कितनी बार होती थीं — क्या उनकी संख्या ठीक थी या बदलाव चाहिए?
- यह ट्रेनिंग ऑनलाइन दी गई थी। ऑनलाइन पढ़ाई का अनुभव कैसा रहा?
- क्या आपको सेशन के दौरान सवाल पूछने का पूरा मौका मिला?
- ट्रेनिंग को और अच्छा बनाने के लिए आपके क्या सुझाव हैं?

### उपयोग की व्यवहारिकता (Feasibility)

- आपने मरीजों को देखने के लिए AI टूल का उपयोग किया। एक ही समय में आपने मरीज से और AI से बात की। यह प्रक्रिया आपके लिए कितनी सहज थी?
- क्या आप बिना किसी रुकावट के टूल का इस्तेमाल कर पाईं? इससे आपके काम के तरीके में क्या बदलाव आया?

## Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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- आपको AI टूल आपके काम में मददगार लगा या रुकावट? कृपया विस्तार से बताएं।

### स्वीकार्यता (Acceptability)

- मरीजों को देखने के दौरान AI टूल का उपयोग करके आपको कैसा लगा?
- क्या आपको टूल की सलाहों पर भरोसा था?
- अगर कोई ऐसा टूल रोजमर्रा के काम में हमेशा के लिए जोड़ दिया जाए, तो क्या आप इसका इस्तेमाल करना चाहेंगी?

### व्यवहारिक पहलू (Practical considerations)

- आपने AI टूल से बातचीत लिखकर / बोलकर / दोनों तरीकों से की। यह अनुभव कैसा था?
- क्या इसे बेहतर किया जा सकता है? क्या सिर्फ एक तरीका (जैसे सिर्फ बोलना या सिर्फ लिखना) बेहतर रहेगा?
- क्या इंटरनेट की स्थिति ने आपके काम को प्रभावित किया?
- अगर हाँ, तो कैसे असर हुआ?

### सीख (Learnings)

- अगर आपको इस प्रोजेक्ट को डिज़ाइन करने वालों को कोई एक सलाह देनी हो, तो वह क्या होगी?

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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## **Annexure – 5 – Consent script for patients**

Study Title: Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study  
Site: Ambikapur, Chhattisgarh

Principal Investigator: [Insert Name, Contact Number]

Hello, my name is [Name]. We are conducting a study at this clinic. We are testing a new AI tool that supports nurses in managing common health problems like high blood pressure, diabetes, joint pain, fever, or breathlessness.

If you agree to participate, here's what will happen:

- You will be seen by both a nurse (who will use the AI tool) and a doctor during today's visit. You are required to travel to two locations to meet with the two providers (doctor and nurse), and we will take care of the transportation arrangements.
- This may take a little extra time compared to a regular visit.
- At the end, you'll be asked to complete a short survey about your experience.

Please note: The nurse may give some advice based on the AI tool, but this is only for the study. You will leave the clinic with the doctor's prescription. Please follow only the doctor's advice for your treatment.

There are no medical risks in joining the study. Whether or not you take part, your regular care will not be affected. Your personal information will be kept private.

As a thank you, you will receive INR 250 after completing your visit and the survey. Taking part is completely up to you. You can say no or stop at any time.

If you have questions after the study, you may contact the Principal Investigator at [Insert Phone Number], or the local Institutional Review Board (IRB) at [Insert IRB Contact Information].

Do you have any questions?

If you agree, we will now ask for your written consent.

☐ Yes, I agree to participate

☐ No, I do not wish to participate

Participant Name & signature : \_\_\_\_\_

Date: \_\_\_\_\_

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

## Annexure – 5.1 – Consent script for patients (Bengali)

স্টাডির নাম: এআই (কম্পিউটারচালিত সহায়ক টুল) ব্যবহার করে নার্স-নেতৃত্বাধীন সেবার মূল্যায়ন স্থান:

স্টাডির প্রধান দায়িত্বশীল ব্যক্তি: [নাম, ফোন নম্বর]

নমস্কার, আমার নাম [নাম]। আমরা এখানে একটি স্টাডি করছি। আমরা একটি নতুন এআই টুল (কম্পিউটারচালিত সহায়ক) পরীক্ষা করছি যা নার্সদের আপনার মতো সমস্যার যত্নে সাহায্য করে— যেমন high pressure, sugar, হাঁটুর বা হাত-পায়ের ব্যথা, জ্বর, বা শ্বাসকষ্ট/শ্বাস ফুলে যাওয়া।

আপনি যদি অংশ নিতে রাজি থাকেন, তাহলে আপনাকে যা করতে হবে:

- আজ আপনাকে একজন নার্স (যিনি এআই টুল ব্যবহার করবেন) এবং একজন চিকিৎসকের দ্বারা দেখা হবে। আপনাকে দুইটি জায়গায় যেতে হবে – একবার ডাক্তার এর সাথে দেখা করতে এবং একবার নার্স এর সাথে দেখা করতে।

- এতে সাধারণ ভিজিটের চেয়ে কিছুটা বেশি সময় লাগতে পারে।

- শেষে, আমরা আপনাকে একটি ছোট সমীক্ষা পূরণ করতে বলব যাতে আপনি আপনার অভিজ্ঞতা জানাতে পারেন।

গুরুত্বপূর্ণ: নার্স এআই টুলের সাহায্যে যে পরামর্শ দেবেন তা শুধুমাত্র এই স্টাডির জন্য। আপনি চিকিৎসকের প্রেসক্রিপশন সহ ক্লিনিক ছাড়বেন এবং আপনার বর্তমান অসুস্থতার জন্য শুধুমাত্র চিকিৎসকের পরামর্শ অনুসরণ করা উচিত।

এই স্টাডিতে অংশগ্রহণে কোনও চিকিৎসাগত ঝুঁকি নেই। আপনি এই স্টাডিতে অংশ নিন বা না নিন, এটি আপনার যত্নে কোনও প্রভাব ফেলবে না। আপনার তথ্য গোপন রাখা হবে।

আপনার সময়ের কৃতজ্ঞতাস্বরূপ, ভিজিট ও জরিপ শেষ করার পরে আপনাকে INR 250 প্রদান করা হবে। অংশগ্রহণ পুরোপুরি আপনার ইচ্ছা। আপনি না বলতে পারেন, বা মাঝপথে থেমে যেতে পারেন। স্টাডি শেষ হওয়ার পরে যদি কোনও প্রশ্ন থাকে, তাহলে আপনি স্টাডির প্রধান দায়িত্বশীল ব্যক্তির সাথে [ফোন নম্বর লিখুন] নম্বরে বা স্থানীয় ইনস্টিটিউশনাল রিভিউ বোর্ড (IRB)-র সাথে [IRB যোগাযোগ লিখুন] যোগাযোগ করতে পারেন।

আপনার কি কোনও প্রশ্ন আছে?

আপনি যদি রাজি থাকেন, আমরা এখন আপনার মৌখিক বা লিখিত সম্মতি নেব।

☐ হ্যাঁ, আমি অংশগ্রহণে সম্মত

☐ না, আমি অংশগ্রহণ করতে চাই না

অংশগ্রহণকারীর নাম (ঐচ্ছিক): \_\_\_\_\_

তারিখ: \_\_\_\_\_

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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## **Annexure – 5.2 – Consent script for patients (Hindi)**

अध्ययन का नाम: एआई (कंप्यूटर से चलने वाला सहायक उपकरण) की मदद से नर्स द्वारा दी जाने वाली देखभाल का मूल्यांकन

स्थान:

मुख्य अध्ययन प्रभारी: [नाम, फ़ोन नंबर]

नमस्ते, मेरा नाम [नाम] है। हम यहाँ एक अध्ययन कर रहे हैं। हम एक नया एआई टूल (कंप्यूटर से चलने वाला सहायक उपकरण) आजमा रहे हैं जो नर्सों को आपकी जैसी बीमारियों की देखभाल में मदद करता है—जैसे उच्च रक्तचाप (ब्लड प्रेशर), शुगर/मधुमेह, जोड़ों का दर्द, बुखार, या सांस फूलना/सांस की तकलीफ़।

अगर आप इसमें भाग लेने के लिए तैयार हों, तो आपको ये करना होगा:

- आज की विज़िट में आपको एक नर्स (जो एआई टूल का उपयोग करेगी) और एक डॉक्टर दोनों देखेंगे। आपको दो जगहों पर जाना होगा – एक डॉक्टर से मिलने और एक नर्स से मिलने के लिए। आपकी यात्रा की व्यवस्था हम कर देंगे।

- इससे सामान्य विज़िट की तुलना में थोड़ा अधिक समय लग सकता है।

- विज़िट के अंत में, हम आपसे आपके अनुभव पर एक छोटा फॉर्म / सर्वे भरने को कहेंगे।

महत्वपूर्ण: नर्स जो भी सलाह देगी, वह केवल इस अध्ययन (रिसर्च) के लिए होगी। आपको क्लिनिक से डॉक्टर का असली पर्चा / इलाज की सलाह मिलेगी। कृपया अपने इलाज के लिए सिर्फ डॉक्टर की सलाह का ही पालन करें। आपके लिए इसमें कोई अतिरिक्त चिकित्सीय (मेडिकल) जोखिम नहीं है। आप भाग लें या न लें—आपको मिलने वाली नियमित चिकित्सा सेवा पर कोई असर नहीं पड़ेगा। आपकी निजी जानकारी गुप्त रखी जाएगी।

आपके समय के लिए धन्यवाद के रूप में, विज़िट और सर्वे पूरा करने के बाद आपको INR 250 दिए जाएंगे। भाग लेना पूरी तरह आपकी मर्जी है। आप चाहें तो मना कर सकते हैं या बीच में कभी भी रुक सकते हैं। अध्ययन के बाद यदि आपके कोई सवाल हों, तो आप मुख्य अध्ययन प्रभारी से [फ़ोन नंबर दर्ज करें] पर या स्थानीय नैतिक समिति (IRB) से [IRB संपर्क जानकारी दर्ज करें] पर बात कर सकते हैं।

क्या आपके कोई सवाल हैं?

अगर आप सहमत हैं, तो हम अभी आपकी मौखिक (मुँह से कहकर) या लिखित सहमति लेंगे।

☐ हाँ, मैं भाग लेने के लिए सहमत हूँ

☐ नहीं, मैं भाग नहीं लेना चाहता/चाहती

प्रतिभागी (रोगी) का नाम (वैकल्पिक): \_\_\_\_\_

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तारीख: \_\_\_\_\_



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## **Annexure – 6 – Consent script for patients (IDI)**

Study Title: Evaluating AI-Assisted Nurse-Led Consultations in Primary Care

### Introduction

Namaste / Nomoskar. My name is [Interviewer's Name], and I'm part of the research team working on a study to improve how nurses and technology can work together to provide better healthcare.

We are inviting you to participate in a one-time interview about your experience during your recent clinic visit, where you received care from a nurse who used a phone or computer (AI tool) to assist in the consultation.

### Purpose of the Interview

The goal of this interview is to better understand what patients like you thought and felt about this new way of receiving care. Your feedback will help us improve the quality and experience of such care for others.

### What Will Happen

- If you agree, we will talk for about 30 to 45 minutes.
- We will ask you about how well you understood the consultation, how comfortable you felt, and if you would be open to receiving similar care in the future.
- With your permission, the conversation will be audio recorded, so we don't miss anything important you say.

### Voluntary Participation

- Your participation is completely voluntary.
- You can refuse to answer any question or stop the interview at any time without giving a reason.
- Saying no will not affect your care in any way.

### Privacy and Confidentiality

- Your name or identity will not be shared in any reports.
- Audio recordings will be stored securely and only accessed by the research team.
- If we use any direct quote from your interview in a report or publication, we will only do so with your permission.

### Risks and Benefits

There are no direct risks or benefits. But your feedback may help improve how care is provided in clinics like this one.

### Incentive

## Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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As a small thank you for your time, we will provide INR 250 after the interview is completed.

Do You Have Any Questions?  
[Pause for any questions]

If you are willing to participate, we will ask you to sign or give your thumb impression on a consent form. Do you agree to take part in this interview?

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## **Annexure – 6.1 – Consent script for patients (IDI) [Bengali]**

গভীর সাক্ষাৎকারের জন্য রোগীর সম্মতি ফর্ম

পরিচিতি

নমস্কার। আমি [ইন্টারভিউ নেওয়ার ব্যক্তির নাম], এবং আমি একটি গবেষণা দলের সদস্য, যারা নার্স ও প্রযুক্তির মাধ্যমে স্বাস্থ্যসেবার মান উন্নত করার জন্য কাজ করছে।

আপনার সাম্প্রতিক ক্লিনিক ভিজিটের অভিজ্ঞতা নিয়ে আমরা একটি এককালীন সাক্ষাৎকার নিতে চাই। সেই সময় আপনি এমন একজন নার্সের কাছে চিকিৎসা পেয়েছিলেন যিনি ফোন বা কম্পিউটার (AI টুল) ব্যবহার করেছিলেন।

এই সাক্ষাৎকারের উদ্দেশ্য

আমরা বুঝতে চাই, আপনি এই ধরনের সেবার বিষয়ে কী ভাবেন এবং কেমন অনুভব করেছেন। আপনার মতামত ভবিষ্যতে এই ধরনের সেবার মান আরও উন্নত করতে সাহায্য করবে।

কি হবে

- আপনি রাজি হলে, আমরা প্রায় ৩০ থেকে ৪৫ মিনিট কথা বলবো।
- আমরা জানতে চাইবো, আপনি পরামর্শ কতটা বুঝেছেন, কতটা স্বাচ্ছন্দ্য বোধ করেছেন, এবং ভবিষ্যতে এই ধরনের সেবা নিতে ইচ্ছুক কিনা।
- আপনার অনুমতি নিয়ে এই কথোপকথন অডিও রেকর্ড করা হবে যেন আমরা কিছু না মিস করি।

স্বেচ্ছাসেবী অংশগ্রহণ

- এই সাক্ষাৎকারে অংশগ্রহণ সম্পূর্ণ স্বেচ্ছাসেবী।
- আপনি যে কোনো প্রশ্ন এড়াতে পারেন বা যেকোনো সময় থেমে যেতে পারেন।
- না বললে আপনার চিকিৎসায় কোনো প্রভাব পড়বে না।

গোপনীয়তা

- আপনার নাম বা পরিচয় কোনো রিপোর্টে ব্যবহার হবে না।
- রেকর্ডিং নিরাপদে রাখা হবে এবং শুধুমাত্র গবেষণা দলের সদস্যরা এটি দেখতে পারবে।
- যদি আপনার বক্তব্য থেকে কিছু উদ্ধৃতি ব্যবহার করা হয়, তবে তা আপনার অনুমতি নিয়েই হবে।

ঝুঁকি ও সুবিধা

এই সাক্ষাৎকারে কোনো ঝুঁকি বা সরাসরি উপকার নেই, তবে আপনার মতামত স্বাস্থ্যসেবা উন্নত করতে সাহায্য করতে পারে।

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উপহার

আপনার সময় দেওয়ার জন্য আমরা ছোট একটি উপহার দেবো [INR 250]।

আপনার কোনো প্রশ্ন আছে?

[প্রশ্নের জন্য বিরতি]

আপনি যদি রাজি থাকেন, তাহলে আমরা একটি সম্মতি ফর্মে আপনার স্বাক্ষর বা আঙুলের ছাপ নেবো। আপনি কি অংশ নিতে সম্মত?

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## **Annexure – 6.2 – Consent script for patients (IDI) [Hindi]**

गहन साक्षात्कार के लिए मरीज की सहमति स्क्रिप्ट

परिचय

नमस्ते। मेरा नाम [साक्षात्कारकर्ता का नाम] है और मैं एक रिसर्च टीम का हिस्सा हूँ जो यह जानने की कोशिश कर रही है कि नर्स और तकनीक मिलकर लोगों को बेहतर इलाज कैसे दे सकते हैं।

हम आपसे एक इंटरव्यू करना चाहते हैं जिसमें हम आपसे आपकी हाल की क्लिनिक विज़िट के बारे में बात करेंगे। उस दौरान आपको एक नर्स ने देखा था जो फोन या कंप्यूटर (AI टूल) का इस्तेमाल कर रही थी।

साक्षात्कार का उद्देश्य

हम यह समझना चाहते हैं कि इस नए तरीके से इलाज पाने के बारे में आपको क्या अनुभव हुआ। आपकी राय इस तरह की देखभाल को और बेहतर बनाने में मदद करेगी।

क्या होगा

- अगर आप सहमत हैं, तो हम आपसे लगभग 30 से 45 मिनट बात करेंगे।
- हम पूछेंगे कि आपने सलाह को कितना समझा, आपको कितना भरोसा और आराम महसूस हुआ, और क्या आप भविष्य में इस तरह की सेवा लेना चाहेंगे।
- आपकी अनुमति से हम बातचीत को ऑडियो में रिकॉर्ड करेंगे ताकि कुछ भी छूट न जाए।

स्वेच्छा से भागीदारी

- इस इंटरव्यू में भाग लेना पूरी तरह से आपकी मर्जी पर निर्भर है।
- आप किसी भी सवाल का जवाब न देने या इंटरव्यू बीच में रोकने के लिए स्वतंत्र हैं।
- न कहने से आपकी चिकित्सा सेवा पर कोई असर नहीं पड़ेगा।

गोपनीयता और पहचान

- आपकी पहचान किसी भी रिपोर्ट में नहीं बताई जाएगी।
- रिकॉर्डिंग को सुरक्षित रूप से रखा जाएगा और केवल शोध टीम को ही इसकी पहुंच होगी।
- अगर आपके इंटरव्यू से कोई बात रिपोर्ट में रखी जाती है, तो वह सिर्फ आपकी अनुमति से ही होगा।

जोखिम और लाभ

इस इंटरव्यू से कोई खतरा नहीं है, लेकिन आपकी राय से भविष्य में इस सेवा को बेहतर किया जा सकता है।

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उपहार

आपके समय के लिए हम आपको एक छोटा सा उपहार देंगे [ INR 250]।

क्या आपको कोई सवाल है?

[प्रश्नों के लिए थोड़ी देर रुकें]

अगर आप तैयार हैं, तो हम आपकी सहमति लेने के लिए एक फॉर्म पर आपके हस्ताक्षर या अंगूठे का निशान लेंगे। क्या आप इस इंटरव्यू में भाग लेने के लिए तैयार हैं?

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

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## **Annexure – 7 – Consent script for nurses**

Study Title: Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

Principal Investigator: [Insert Full Name, Qualifications, Contact Information]

Study Site:[Insert Health Facility Name and Address]

You are being invited to participate in a research study being conducted by [Name of Institution/NGO]. This study aims to assess the effectiveness of an AI-enabled-nurse treatment care model for managing common chronic conditions and symptoms in a primary care setting in rural India.

Before you decide, please read the following information carefully. You are welcome to ask questions before agreeing to participate.

Your role and responsibilities:

If you agree to participate, you will be expected to:

- Participate in a training program about medical and AI literacy.
- Do a clinical consultation with patients using the AI-supported clinical decision tool.
- Allow your consultations with patients to be audio recorded. These recordings will help researchers study how the tool is used in real clinical interactions.
- Participate in a one-on-one in-depth interview with a member of the research team. This interview will explore your experience using the AI tool, including what worked well and what challenges you faced. The interview will take approximately 45 to 60 minutes and will be scheduled at your convenience.

Your identity and all personal information will be kept strictly confidential. Audio recordings will be securely stored and only accessible to the core research team. All findings will be reported in aggregate or anonymized form. If any direct quotes from your interview are used in research outputs (such as reports, presentations, or publications), they will be included only with your explicit permission.

Your participation is entirely voluntary. You are free to decline or withdraw from the study at any time.

There are no known risks associated with your participation. Your insights and feedback will help improve the design and implementation of digital tools for nurses in clinical settings.

If you have any questions, please contact:

Principal Investigator: [Insert Name, Phone Number, Email]

Institutional Review Board (IRB): [Insert IRB Contact Information]

Consent Statement

☐ I have read and understood the information above. I have had the opportunity to ask questions and all my questions have been answered. I voluntarily agree to participate in this study, including having my consultations audio recorded and participating in an in-depth interview. I understand that any direct quotes from my interview will only be used with my permission.

Nurse's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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## Annexure - 7.1 – Consent script for nurses (Bengali)

### নার্স সম্মতি ফর্ম – নার্স-এআই স্টাডি

গবেষণার নাম:

গবেষক প্রধানের নাম: [সম্পূর্ণ নাম ও যোগাযোগের তথ্য]

স্বাস্থ্যকেন্দ্রের নাম ও ঠিকানা: [এখানে লিখুন]

আপনাকে এই গবেষণায় অংশ নিতে আমন্ত্রণ জানানো হচ্ছে।

এই গবেষণায় আমরা দেখতে চাই, নার্সরা যখন রোগী দেখেন, আর এক ধরনের কম্পিউটার সাহায্য নেয় (যাকে আমরা এআই বা আর্টিফিশিয়াল ইন্টেলিজেন্স বলি), তখন রোগী দেখার গুণমান কেমন হয়।

### আপনি যদি অংশ নিতে রাজি হন, তাহলে আপনাকে যা করতে হবে:

1. আপনাকে একটি প্রশিক্ষণ প্রোগ্রামে অংশ নিতে হবে, যেখানে চিকিৎসা এবং কৃত্রিম বুদ্ধিমত্তা (AI) সম্পর্কে সহজ ভাষায় শেখানো হবে।
2. রোগীদের চিকিৎসা দেবেন – যেমন আপনি করেন, তবে এবার আপনি এক বিশেষ মোবাইল অ্যাপ বা কম্পিউটার টুল ব্যবহার করবেন যেটা চিকিৎসায় সাহায্য করবে।
3. রোগীদের সাথে আপনার কথা হবে, সেটা রেকর্ড করা হবে (অডিও রেকর্ডিং)। এতে আমরা বুঝতে পারব, আপনি এই টুলটি কীভাবে ব্যবহার করছেন।
4. আমরা আপনাকে একবার ৪৫ থেকে ৬০ মিনিটের একটি সাক্ষাৎকারে অংশ নিতে বলব। সেখানে আপনি বলবেন – এই টুল ব্যবহার করে আপনার কেমন লেগেছে, ভালো কী হয়েছে, আর কোথায় অসুবিধা হয়েছে।

### কিছু গুরুত্বপূর্ণ তথ্য:

- আপনার নাম বা পরিচয় কোথাও প্রকাশ করা হবে না।
- আপনার কথা রেকর্ড করা হবে, কিন্তু শুধু গবেষণা দলের কয়েকজন মানুষ সেটা শুনতে পারবে।
- আপনার ইন্টারভিউ থেকে যদি কোনো কথা রিপোর্টে বা লেখায় ব্যবহার করা হয়, তাহলে সেটা হবে শুধু আপনার অনুমতি নিয়ে।
- আপনি চাইলে, যে কোনো সময় এই গবেষণা থেকে সরে আসতে পারেন। এতে আপনার কোনো ক্ষতি হবে না।
- এই গবেষণায় অংশ নিলে আপনার কোনো শারীরিক ক্ষতির আশঙ্কা নেই।
- আপনার অভিজ্ঞতা ও মতামত ভবিষ্যতে এই ধরনের টুল ভালোভাবে বানাতে সাহায্য করবে।



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## কোনো প্রশ্ন থাকলে যোগাযোগ করুন:

গবেষণার প্রধান ব্যক্তি: [নাম, ফোন নম্বর, ইমেইল]

পরীক্ষা অনুমোদন বোর্ড (IRB): [IRB-এর যোগাযোগের তথ্য]

## সম্মতির অংশ

☐ আমি এই গবেষণা সম্পর্কে সব কথা বুঝেছি। আমার যা জানার ছিল, সব জানতে পেরেছি। আমি নিজে থেকে এই গবেষণায় অংশ নিতে রাজি আছি। আমি জানি, আমার কথা রেকর্ড করা হবে, আর আমাকে একটি সাক্ষাৎকারে অংশ নিতে বলা হবে। আমার অনুমতি ছাড়া আমার কোনো কথা কোথাও প্রকাশ করা হবে না।

নার্সের নাম: \_\_\_\_\_

স্বাক্ষর: \_\_\_\_\_

তারিখ: \_\_\_\_\_

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## Annexure - 7.2 – Consent script for nurses (Hindi)

### नर्स की सहमति फॉर्म – नर्स-AI अध्ययन

अध्ययन का नाम:

मुख्य अन्वेषक (Principal Investigator): [पूरा नाम, योग्यता, संपर्क जानकारी]

अध्ययन स्थल: [स्वास्थ्य केंद्र का नाम और पता]

आपको एक शोध अध्ययन में भाग लेने के लिए आमंत्रित किया गया है। यह अध्ययन [संस्था / NGO का नाम] द्वारा किया जा रहा है। इस अध्ययन का उद्देश्य ग्रामीण भारत के प्राथमिक स्वास्थ्य केंद्रों में आम पुरानी बीमारियों और लक्षणों के इलाज के लिए AI (कृत्रिम बुद्धिमत्ता) से मदद पाने वाले नर्स देखभाल मॉडल की प्रभावशीलता को समझना है।

कृपया नीचे दी गई जानकारी ध्यान से पढ़ें। यदि आपके कोई प्रश्न हों तो आप पूछ सकते हैं। अध्ययन में भाग लेना पूरी तरह से आपकी इच्छा पर निर्भर है।

### आपकी भूमिका और जिम्मेदारियां:

यदि आप इस अध्ययन में भाग लेने के लिए सहमत होते हैं, तो आपसे यह अपेक्षा की जाएगी कि आप:

- आपको एक प्रशिक्षण कार्यक्रम में भाग लेना होगा, जिसमें इलाज और एआई (कृत्रिम बुद्धिमत्ता) के बारे में जानकारी दी जाएगी।
- AI (कृत्रिम बुद्धिमत्ता) से सहायता पाने वाले क्लिनिकल टूल का उपयोग करते हुए मरीजों को परामर्श दें।
- आपकी मरीजों के साथ बातचीत को ऑडियो रिकॉर्ड किया जाएगा। यह रिकॉर्डिंग हमें यह समझने में मदद करेगी कि असल जीवन में इस टूल का उपयोग कैसे हो रहा है।
- आपसे एक गहन इंटरव्यू (इन-डेप्थ इंटरव्यू) लिया जाएगा जिसमें आप AI टूल के उपयोग से जुड़े अपने अनुभव साझा करेंगे – जैसे कि क्या अच्छा रहा, क्या कठिनाइयाँ आईं। यह इंटरव्यू लगभग 45 से 60 मिनट का होगा और आपके सुविधाजनक समय पर लिया जाएगा।

आपकी पहचान और सारी व्यक्तिगत जानकारी को पूरी तरह गोपनीय रखा जाएगा। रिकॉर्डिंग केवल अनुसंधान टीम के पास सुरक्षित रूप से रखी जाएगी। अध्ययन के निष्कर्ष समूह के रूप में या गुमनाम रूप से साझा किए जाएंगे। यदि आपके इंटरव्यू से कोई सीधी बात (quote) रिपोर्ट, प्रस्तुति या प्रकाशन में उपयोग की जाती है, तो वह केवल आपकी अनुमति से ही किया जाएगा।

अध्ययन में भाग लेना पूरी तरह स्वैच्छिक है। आप कभी भी मना कर सकते हैं या बीच में भी हट सकते हैं।

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इस अध्ययन में भाग लेने से कोई ज्ञात खतरा नहीं है। आपके अनुभव और सुझाव इस तरह के डिजिटल टूल्स को बेहतर बनाने में मदद करेंगे।

यदि आपके कोई प्रश्न हैं, तो कृपया संपर्क करें:

मुख्य अन्वेषक: [नाम, फोन नंबर, ईमेल]

संस्थागत समीक्षा बोर्ड (IRB): [IRB की संपर्क जानकारी]

### सहमति कथन

☐ मैंने ऊपर दी गई जानकारी को पढ़ा और समझा है। मुझे अपने प्रश्न पूछने का अवसर मिला और मेरे सभी प्रश्नों के उत्तर दे दिए गए हैं। मैं स्वेच्छा से इस अध्ययन में भाग लेने के लिए सहमत हूँ, जिसमें मेरी मरीजों से बातचीत की ऑडियो रिकॉर्डिंग और गहन इंटरव्यू शामिल है। मुझे यह भी समझ है कि मेरे इंटरव्यू से कोई सीधी बात केवल मेरी अनुमति से ही उपयोग की जाएगी।

नर्स का नाम: \_\_\_\_\_

हस्ताक्षर: \_\_\_\_\_

तिथि: \_\_\_\_\_

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## **Annexure – 8 – Consent script for doctors**

Study Title: Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

Principal Investigator: [Insert Name, Contact Number]

Site: [Insert Facility Name]

Dear Doctor,

You are being invited to participate in a research study that aims to assess the effectiveness of an AI-enabled-nurse treatment care model for managing common chronic conditions and symptoms in a primary care setting in rural India.

If you agree to participate:

- You will see patients presenting with two chronic conditions (e.g., hypertension and diabetes) and three common symptoms (e.g., fever, breathlessness, and joint pain) as part of your routine consultations.
- After each consultation, you will be asked to complete a brief proforma documenting key clinical details, which is expected to take 5 to 8 minutes.
- The audio of your consultation with each patient will be recorded. These recordings will be used solely for analysis of clinical communication and decision-making.

Your identity will be kept strictly confidential. No audio recordings will be shared outside the research team. The audio recordings will be retained for 5 years, as stipulated by national and local IRB rules and regulations. All data will be used in aggregate form only. No quotes or identifying information will be used in any reports or publications. You will receive INR 500 per completed consultation as compensation for your time and participation in the study. Your participation is entirely voluntary. You may withdraw from the study at any time without any consequences to your professional standing or responsibilities.

If you have any questions about the study, you may contact the Principal Investigator at [Insert Contact Number] or the local IRB at [insert contact details]

**\*\*Consent:\*\***

☐ I have read and understood the purpose of the study and my role in it. I voluntarily agree to participate.

Doctor's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# Assessing the effectiveness of Large Language Model (LLM) - enabled nurse treatment planning in 2 Indian districts: A pilot study

## Annexure – 9.1 – Budget (West Bengal)

Exchange rate: 1 USD = INR 83.5

Particulars	Unit	Unit cost (\$)	Duration (months)	Total (\$)
<b>Human resource</b>				
Physician reimbursement @ INR 500 per patient	336	6		2016
Biostatistician	1	4000		4000
Research assistant	1	300	6	1800
<b>Sub-total</b>				<b>7816</b>
<b>Program costs</b>				
Human-centered design workshop (local & outstation travel, stay, resource person fee, operations, per diem)	1			3000
Nurses (full time hire)	3	250	6	4500
Nurses (reserve) (0.5 FTE)	3	250	2	1500
LLM platform membership	4	20	10	800
Android tablets / laptops	3	200		600
Participant incentives	356	3		1068
Miscellaneous costs				1000
<b>Sub-total</b>				<b>12468</b>
<b>Total of HR + program costs</b>				<b>20284</b>
Indirect costs @5%				1014.2
<b>Grand total</b>				<b>21298.2</b>

## Annexure – 9.2 Budget (Chhattisgarh)

Particulars	Unit	Unit cost (\$)	Duration (months)	Total (\$)
<b>Human resource</b>				
Physician reimbursement @ INR 500 per patient	336	6		2016.0
Research associate	1	600	6	3600.0

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Subtotal				5616.0
Program costs				
Nurses (full time hire)	3	250	6	4500.0
Nurses (reserve) @ 0.5 FTE	3	125	2	750.0
LLM platform membership	4	20	10	800.0
Android tablets / laptops	3	200		600.0
Participant incentives	356	3		1068.0
Miscellaneous costs				1000.0
Subtotal				8718.0
Total HR + program costs				14334.0
Indirect costs @5%				716.7
Grand total				15050.7