



# Weill Cornell Medicine

## AI-Powered, Point-of-Care Testing for Preeclampsia Prediction

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# AI-Powered, Point-of-Care Testing for Preeclampsia Prediction

## Background & Unmet Need

- Preeclampsia is a serious hypertensive disorder of pregnancy that typically occurs  $\geq 20$  weeks of gestation and affects 2-8% of pregnancies worldwide
- Preeclampsia is the third leading cause of maternal mortality in the U.S., and  $\sim 10\%$  of perinatal death is due to pregnancy complicated by preeclampsia
- Early interventions, such as low-dose aspirin, may be useful for preventing pre-term preeclampsia in at-risk women, but screening is challenging as many patients are asymptomatic
- Existing prediction methods largely depend on non-specific laboratory testing, clinical judgment and specialized knowledge, which may restrict their accessibility across different healthcare settings
- Moreover, the best predictive biomarker, the SFIT/PIGF ratio, has limited positive predictive value and is primarily used to rule out the condition
- **Unmet Need:** Early, accurate, and universally accessible methods to predict preeclampsia

## Technology Overview

- **The Technology:** Integrated system combining blood testing and predictive modeling using AI and machine learning algorithms to accurately predict the risk of preeclampsia in pregnant women
- The model integrates data on maternal characteristics (e.g., age, race, gestational age, medical history) and routine lab results (e.g., CBC, basic metabolic panel, urine protein analysis)
- The model generates a rolling risk estimates at different gestational age windows between 28-40 weeks, forecasting preeclampsia onset within 1, 2, and 4 weeks
- This provides dynamic, short-term prediction of preeclampsia in late gestation using routine data
- **PoC Data:** The model was trained on  $\sim 36k$  patient records across three demographically distinct hospitals, achieving rolling AUCs between 0.75-0.88 across gestational weeks from 28 to 40

## Inventors:

Zhen Zhao  
Fei Wang  
Tracy Grossman  
Yaxin Li  
Haoyang Li

## Patents:

PCT Application Filed

## Publications:

[Li et al. medRxiv. 2025](#) (pre-print)

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## Cornell Reference:

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## Technology Applications

- Routine prediction of preeclampsia in both acute clinical and routine prenatal care settings to facilitate early intervention
- Integration with EHR or telehealth platforms for continuous monitoring of high-risk patients
- Use as a research tool to analyze patterns and outcomes for preeclampsia

## Technology Advantages

- Exclusively uses standard clinical lab results and patient data, streamlining integration with existing EHR systems
- Output does not require specialized interpretation by obstetrics providers, increasing utility in low resource or rural settings
- Provides real time processing and results to inform care

## Supporting Data / Figures

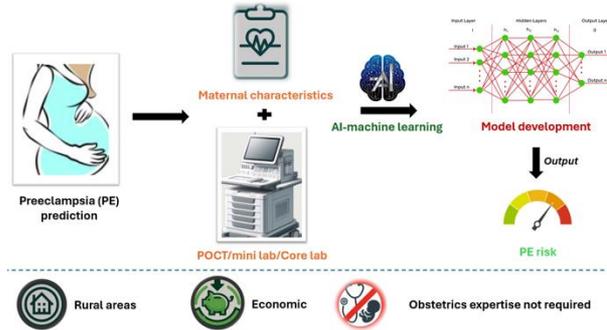


Figure 1: Graphical abstract of preeclampsia prediction framework.

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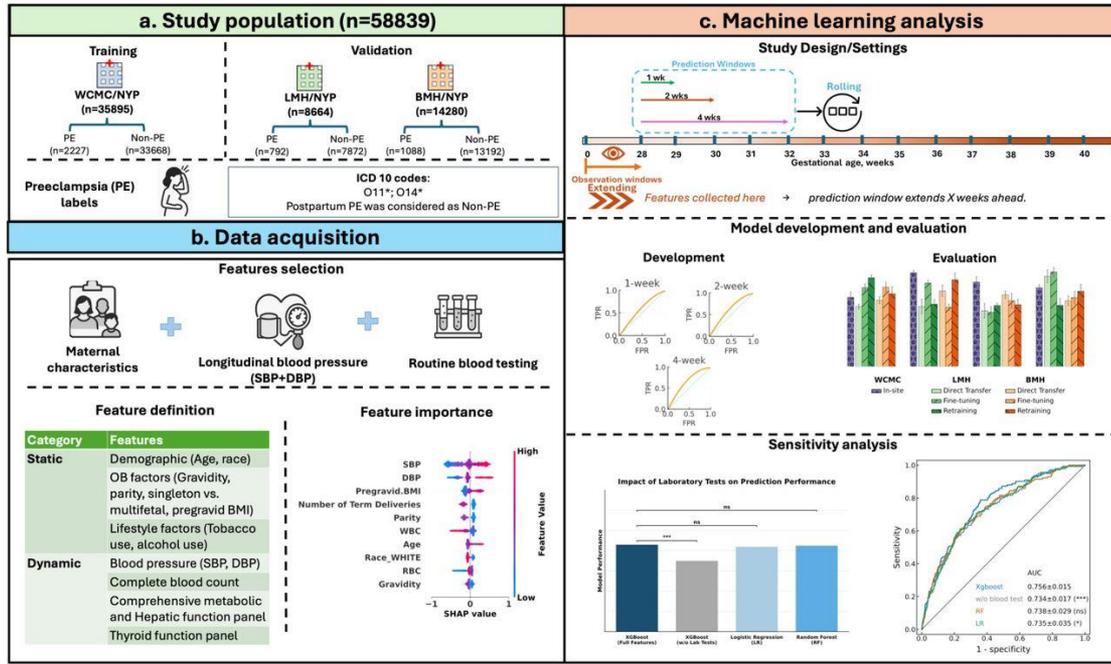
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## Supporting Data / Figures



**Figure 2:**  
Overview of model development and validation.

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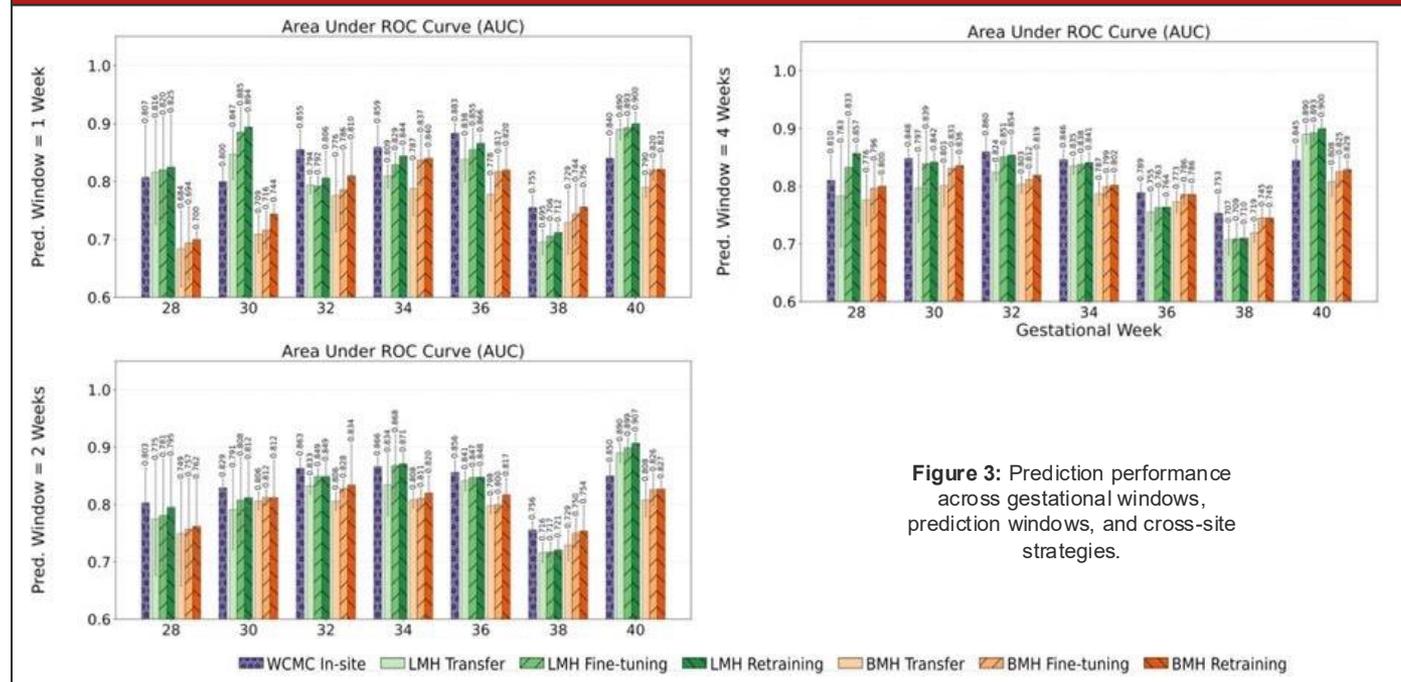
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**Figure 3:** Prediction performance across gestational windows, prediction windows, and cross-site strategies.

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