មជ្ឈមណ្ឌលជាតិការពារមាតា និងទារក
NATIONAL MATERNAL AND CHILD HEALTH CENTER

ទិវាសល្យសាស្ត្រ សម្ភព និងរោគស្ត្រី លើកទី៣

ប្រធានបទ៖ «ការព្រឹង និងបង្កើនសេវាព្យាបាល ថែទាំ សង្គ្រោះ ប្រកបដោយគុណភាព »

Prediction and prevention in preeclampsia

Presented by **TIM PICHNISSAY, DR.OBGYN.**

ថ្ងៃទី៤-៥ ខែកញ្ញា ឆ្នាំ២០២៥
សណ្ឋាគារភ្នំពេញ

WHAT IS MODERN OBSTETRICS?

1. **Identification of risk factors** (before pregnancy if possible)
2. **Prediction**
3. **Prevention** by undertaking the necessary measures (when existing) to reduce the prevalence of the disease.
4. **Early diagnosis**
5. **Medical care and decisions**

CONTENT

1.Prediction of PE

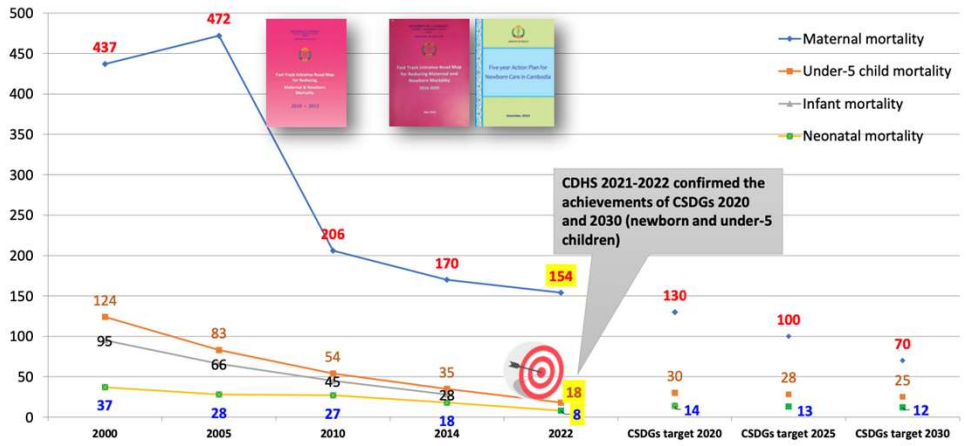
2.Prevention of PE

3.Evaluation of PE

PREECLAMPSIA

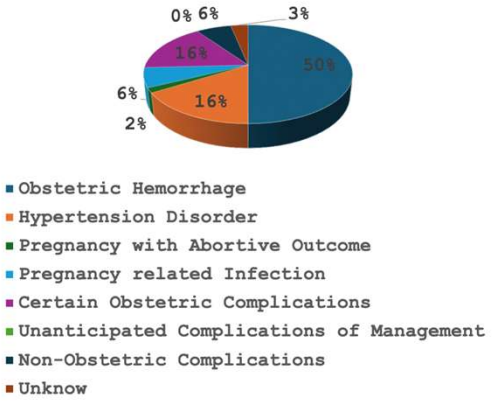
- Affects 5-8% of all pregnancies
- A leading cause of maternal and infant mortality with nearly **76 000** maternal and **500 000** infant death each year worldwide
- During pregnancy and postpartum and affect **both** mother and baby
- African and Asian women are **4 x** likely to be affected
- Doubles a women's risk for developing heart disease or having **a stroke over the 5-15 years**

Impact result: Trend of maternal, neonatal & under-5 child mortality in Cambodia, 2000-2022



Data source: CDHS, GPCC, CSDGs and UN-IGME (UN Inter-agency Group for Child Mortality Estimation)

Causes of Maternal Death 2024 (62 cases)



MATERNAL RISK FACTORS FOR ACCORDING TO PROFESSIONAL ORGANIZATION

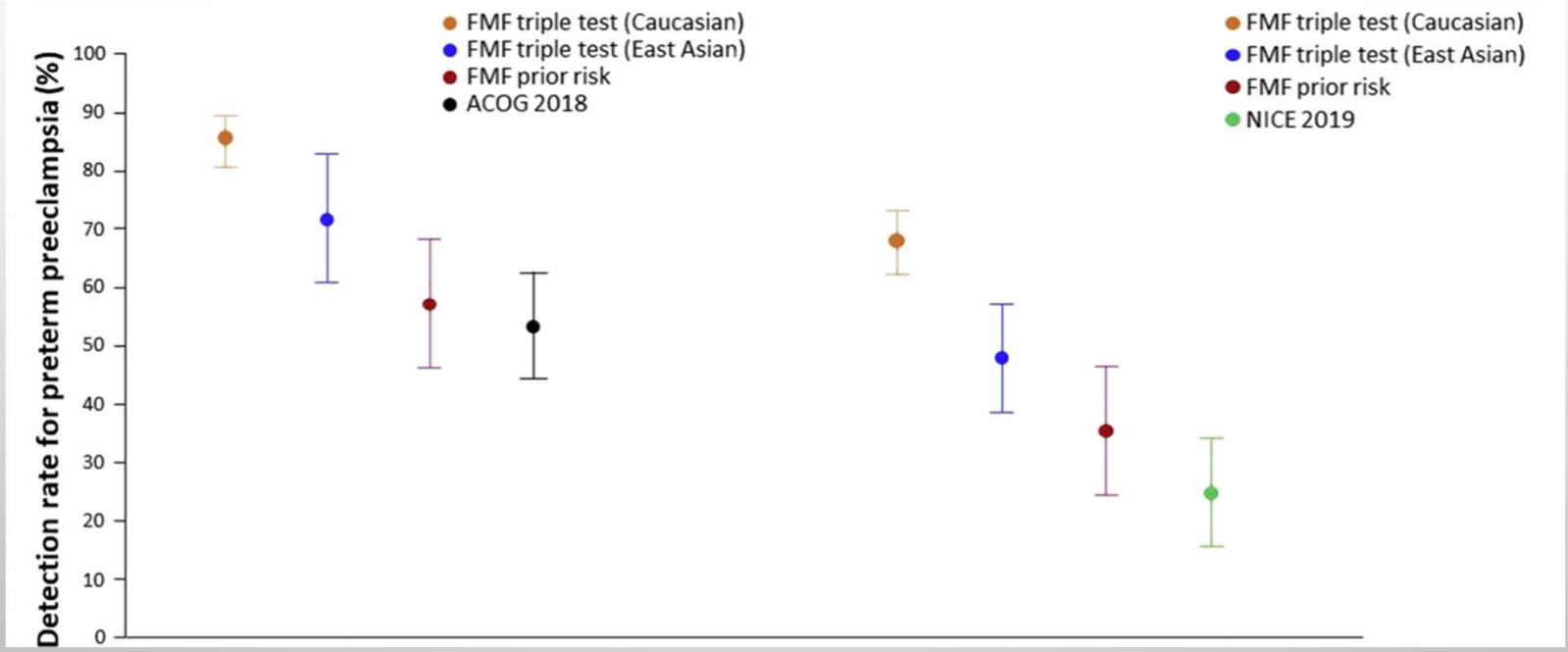
ACOG 201848 (United States of America)	NICE 201949 (United Kingdom)
Hight-Risk Factors	**Hight-Risk Factors**
Previous pregnancy of PE, Chronic HBP , SLE DM type I/II, Renal disease, Multifetal gestational APS	Previous pregnancy with PE, Chronic HPB , Autoimmune disease , DM type I/type II Chronic kidney disease, APS
Moderate Risk Factors	**Moderate Risk Factors**
Nulliparity, Age>35y, interval pregnancy> 10y, BMI>30kg/m2 Family history of PE, History of SGA or aadvaerse outcome Sociodermo-graphic characteristic (Aftrican Americal race or low sociaoeconomic status)	Nulliparity, Age>40y, interpregnancy interval>10y BMI at first visit, >35 kg/m2 Family history of PE , Multifetal pregnaccy

DR: Preterm 5%
Terme 2%
FP 0,2%

DR : Preterm 41%
term 34%
FP 10%

Chaemsaithong. First trimester preeclampsia screening and prediction. Am J Obstet Gynecol 2022.

Screening performance for preterm preeclampsia according to the FMF triple test, FMF prior risk, NICE 2019, and ACOG 2018 guidelines



Screening performance is derived from Tan et al62 and Chaemsaithong et al.60

ACOG, American College of Obstetricians and Gynecologists; FMF, Fetal Medicine Foundation; NICE, National Institute for Health and Care Excellence. Chaemsaithong. First trimester preeclampsia screening and prediction. Am J Obstet Gynecol 2022.

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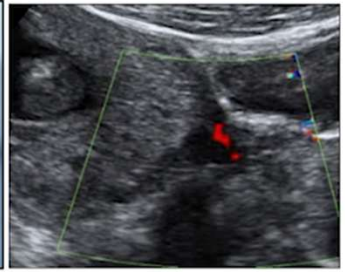
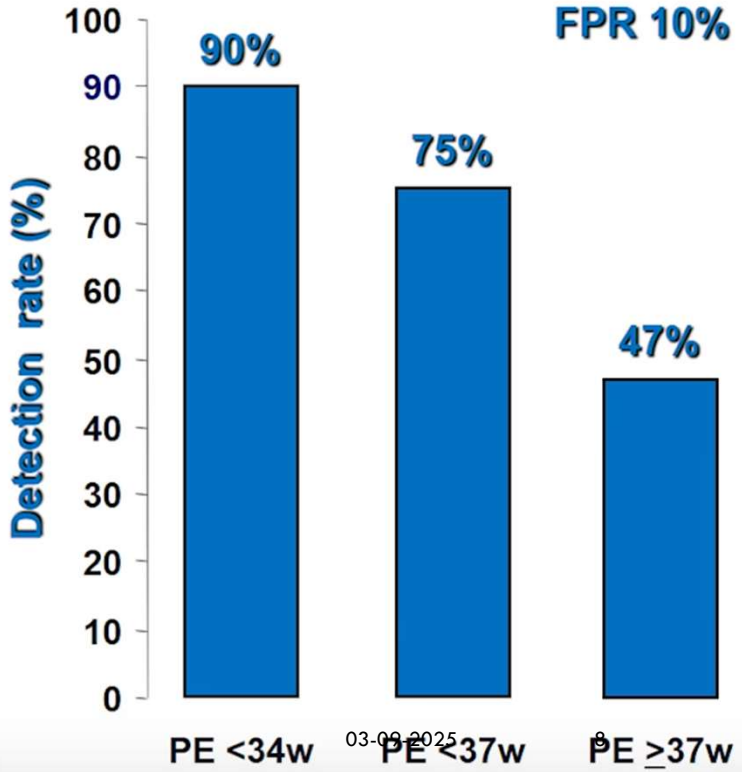
Prediction of preeclampsia

Maternal risk factors

- Age: every 10 years above 30 y
- Weight: every 10 kg above 70 kg
- Racial origin
  - Afro-Caribbean
  - South Asian
- Obstetric history
  - First pregnancy
  - Previous preeclampsia
- Family history of preeclampsia
- Conception by IVF
- Chronic hypertension
- Diabetes mellitus
- Autoimmune : SLE / APS



Screening in 35,948 pregnancies



History, MAP, UT PI, PLGF

AJOG American Journal of Obstetrics & Gynecology

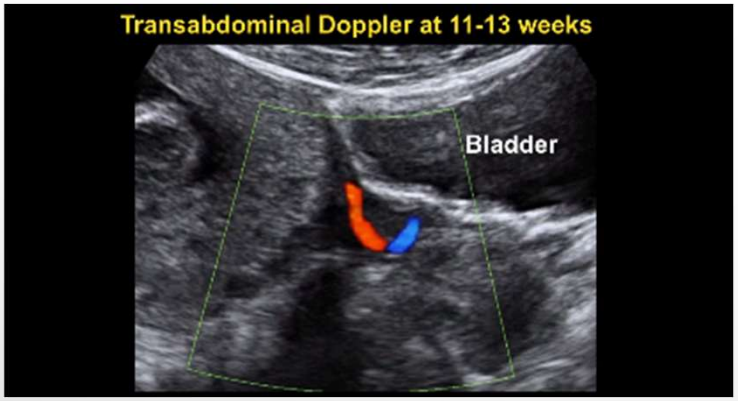
O' Gorman et al. Competing risks model in screening for preeclampsia by maternal factors and biomarkers at 11-13 weeks. Am J Obstet Gynecol 2016; 214: 103

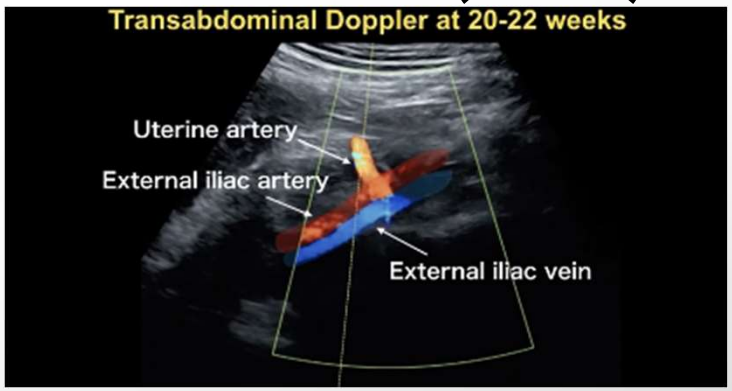
PREDICTION OF PREECLAMPSIA MEASUREMENT OF MEAN ARTERIAL PRESSURE (MAP)

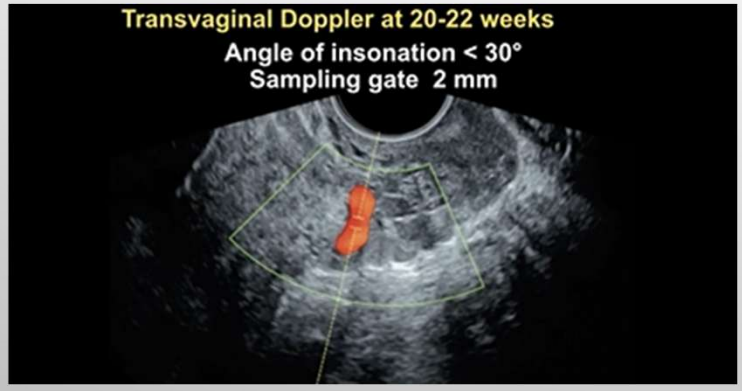
- MAP = 2/3 DIASTOLIC BLOOD PRESSURE + 1/3 SYSTOLIC BLOOD PRESSURE.
- VALIDATED AUTOMATED **DEVICES**
- SITTING POSITION AND THEIR LEGS SHOULD NOT BE CROSSED
- THE ARMS OF THE PATIENT SHOULD BE SUPPORTED AT THE LEVEL OF HER HEART
- **REST** FOR FIVE MINUTES
- TWO MEASUREMENTS OF MAP SHOULD BE TAKEN FROM EACH ARM SIMULTANEOUSLY

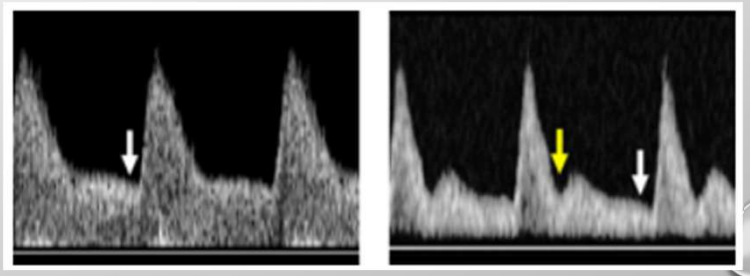
Poon, L. C., et al. (2012). "Protocol for measurement of mean arterial pressure at 11-13 weeks' gestation." Fetal Diagn Ther **31**(1): 42-48.

PREDICTION OF PREECLAMPSIA
MEASUREMENT OF UTERINE ARTERY PI (UTPI)

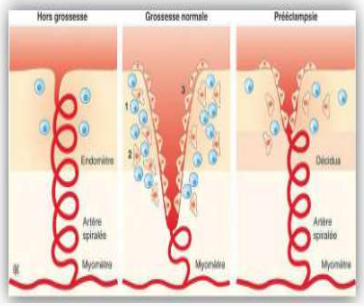


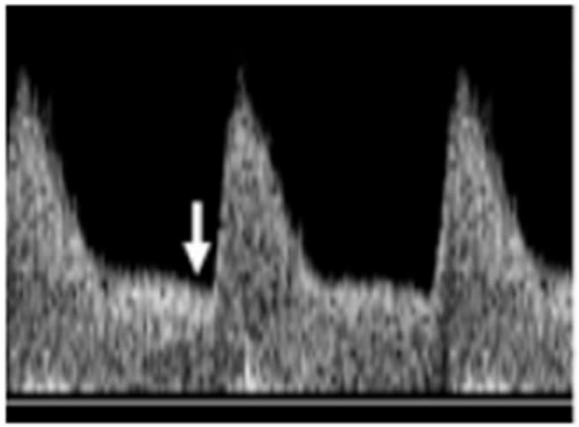


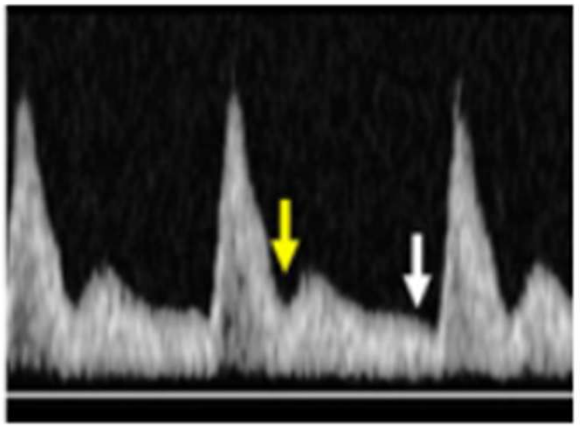




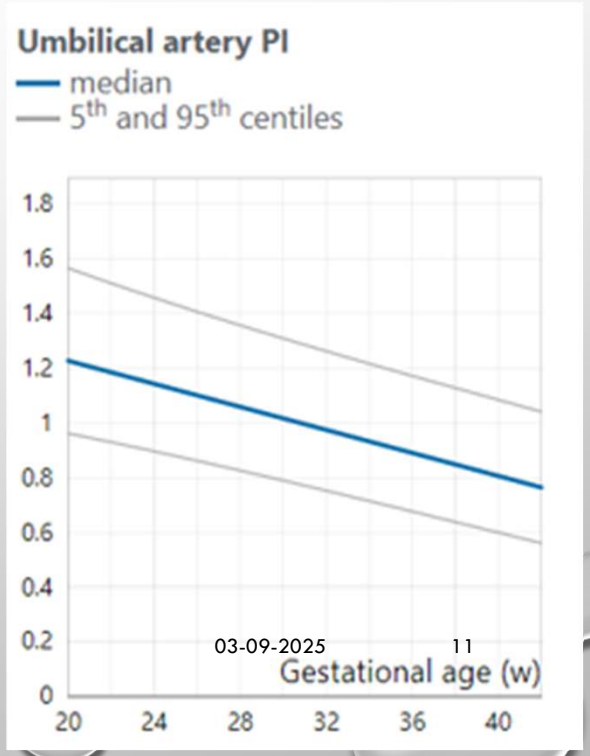
PREDICTION OF PREECLAMPSIA
MEASUREMENT OF UTERINE ARTERY PI (UTPI)







Pulsatility index					
Week	n	Mean	SD	5th percentile	95th percentile
11	61	1.6	0.5	0.8	2.5
12	188	1.5	0.6	0.7	2.6
13	133	1.4	0.4	0.8	2.2
14	27	1.3	0.4	0.7	1.9

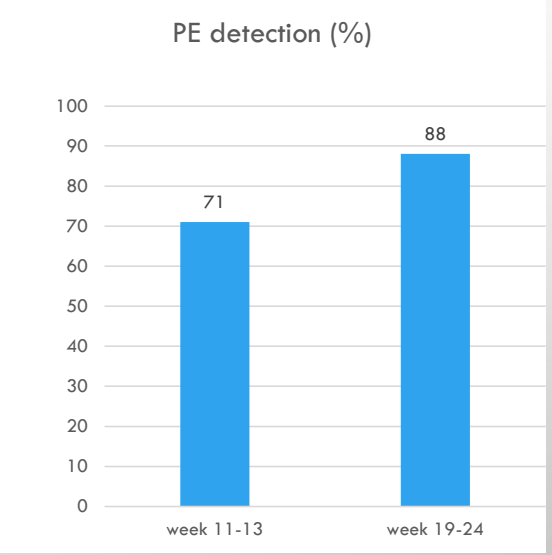


PREDICTION OF PREECLAMPSIA
UTERINE ARTERY PULSATILITY INDEX (UTPI)

The detection rate, at a 10% false-positive rate.

-For artery onset PE (onset < 32 weeks) was

- 71% at 11-13 weeks
- 88% at 19-24 weeks,



O'Gorman, N., et al. (2016). "Uterine artery pulsatility index at 12, 22, 32 and 36 weeks' gestation in screening for pre-eclampsia." Ultrasound Obstet Gynecol **47**(5): 565-572.

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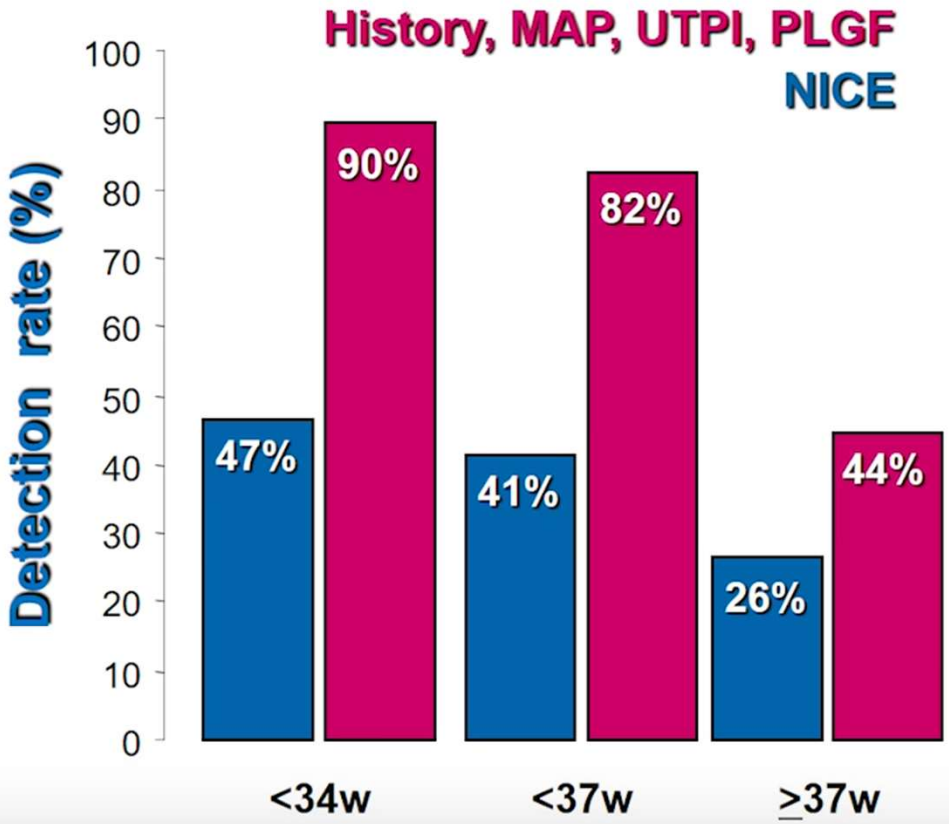
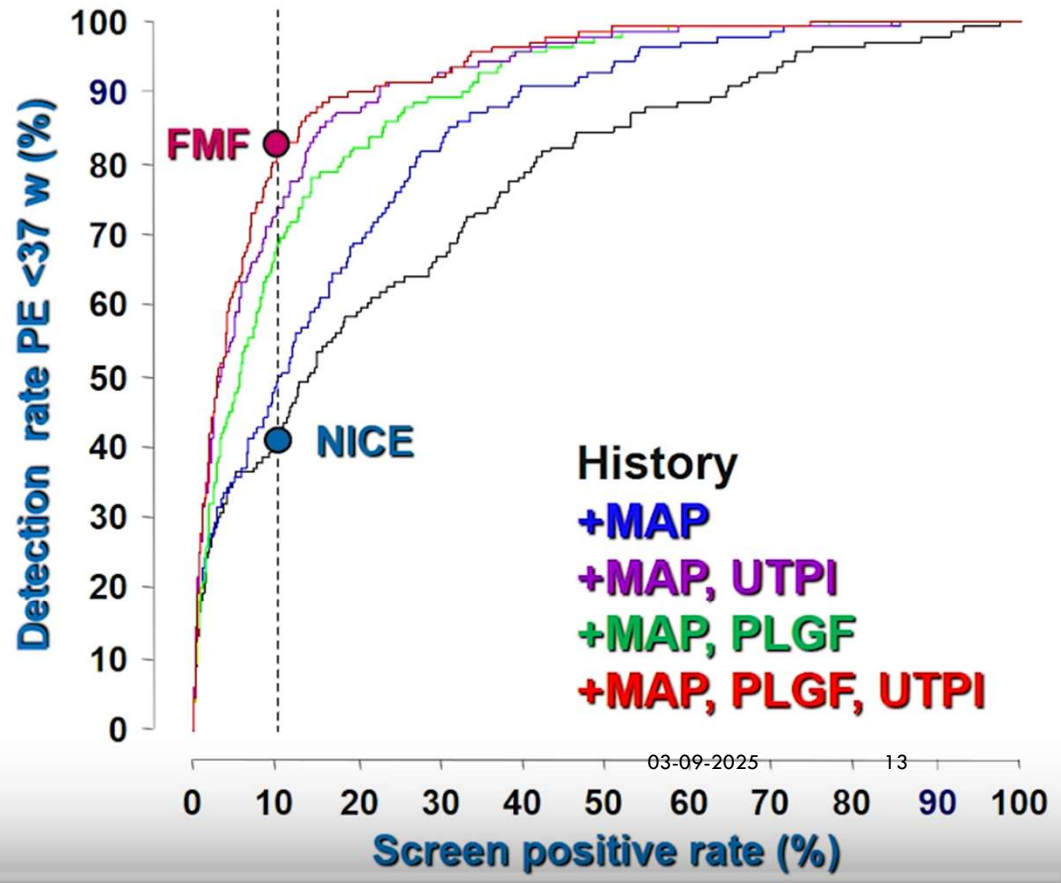
Validation of FMF algorithm





Screening for Preeclampsia

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Prediction of PE at <37 w

Pregnancies: n = 61,364

Preeclampsia
total: n = 1,757 (2.9%)
<37 w: n = 483 (0.8%)

Method of screening	DR %
History	48
+ MAP	55
+ MAP, PAPP-A	59
+ MAP, UTPI	70
+ MAP, UTPI, PAPP-A	71
+ MAP, PLGF	69
+ MAP, UTPI, PLGF	**76**
+ MAP, UTPI, PLGF, PAPP-A	76

PREVENTION OF PREECLAMPSIA

Bed rest and dietary manipulations

The rate of PE is not reduced by:

- Bed rest or restriction of physical activity.
- Restriction of salt intake.
- Supplementation with magnesium, zinc, folate, vitamins C and E or fish oil.

The rate of PE is halved by:

- Dietary calcium (1.2 - 2.5 g/d) in women with low calcium intake (<600 mg/d).

Hofmeyr, G. J., et al. (2018). "Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems." Cochrane Database Syst Rev **10**: CD001059.

PREVENTION OF PREECLAMPSIA
ASPRE TRIAL

- International, multicentric trial
- Routine screening for preterm PE was carried out at 11-13 weeks' gestation
- Maternal factors and biomarkers in about 27,000 singleton pregnancies.
- Aspirin (150 mg/day) or placebo from 11-14 weeks' gestation until 36 weeks
- Take the tablet at night, rather than during the day
- 62% reduction in the incidence of PE < 37 weeks' gestation.
- 82% reduction in the incidence of PE at <34 weeks' gestation.

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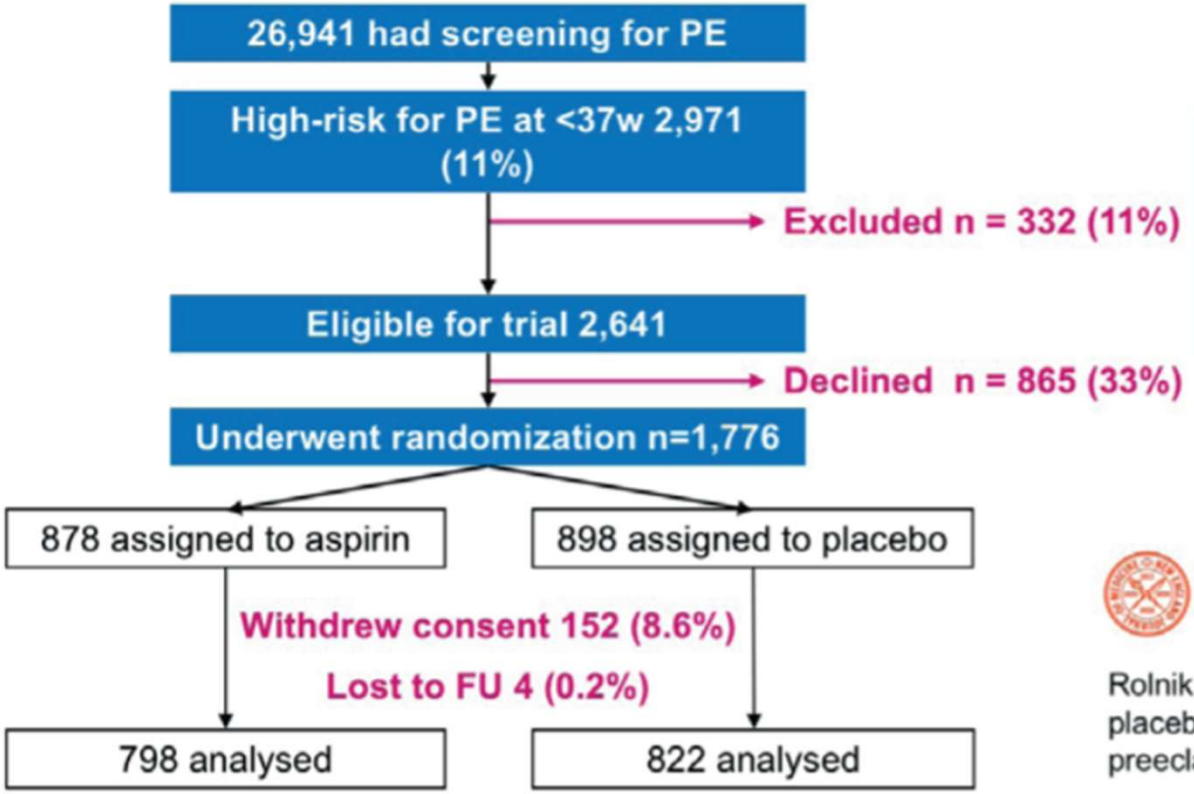
ASPRE project

Prevention of preeclampsia



253	Receiving aspirin
47	Hypersensitivity to aspirin
17	Peptic ulcer, bleeding disorders
10	Participation in another drug trial
2	Miscarriage before randomization
3	Termination before randomization

The NEW ENGLAND JOURNAL of MEDICINE

Rolnik DL, Wright D, Poon L, et al. Aspirin versus placebo in pregnancies at high risk of preterm preeclampsia. N Engl J Med 2017;377:613-22.

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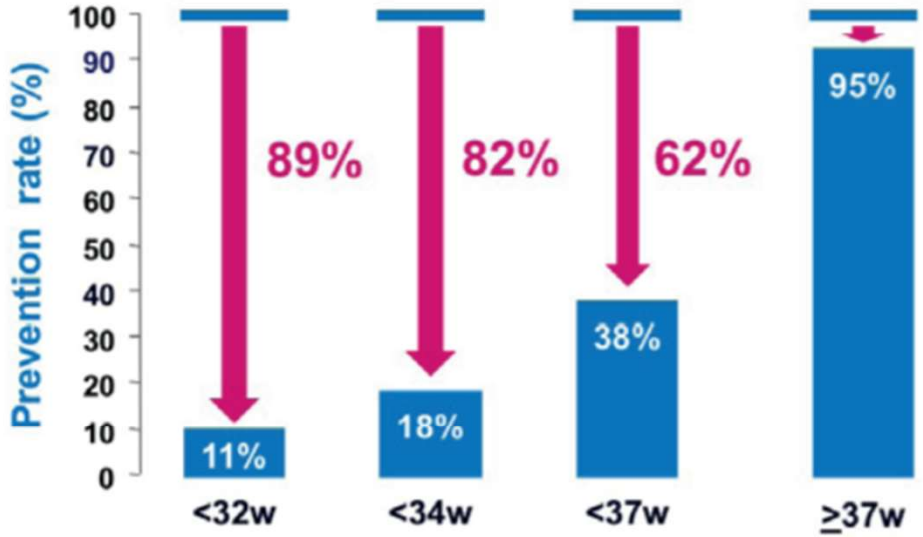
ASPRE project

Prevention of preeclampsia



The NEW ENGLAND JOURNAL of MEDICINE

Rolnik DL, Wright D, Poon L, et al. Aspirin versus placebo in pregnancies at high risk of preterm preeclampsia. N Engl J Med 2017;377:613-22.

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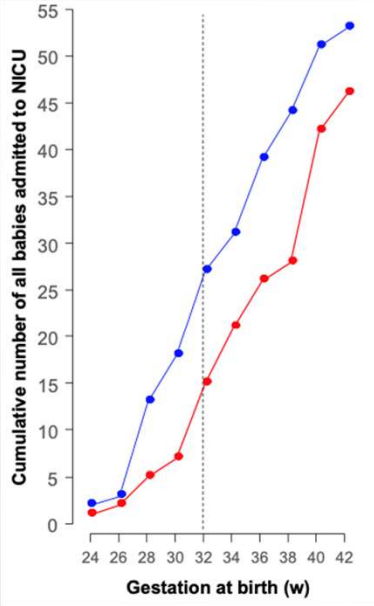
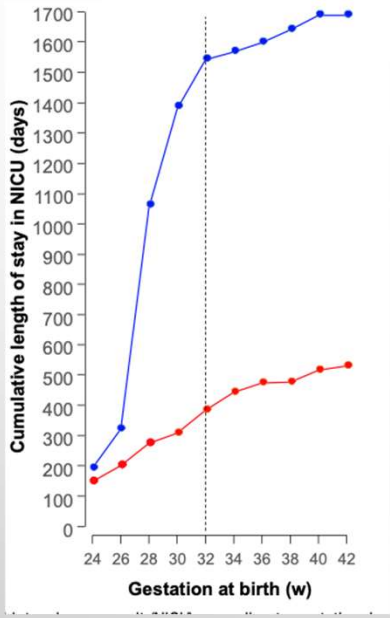
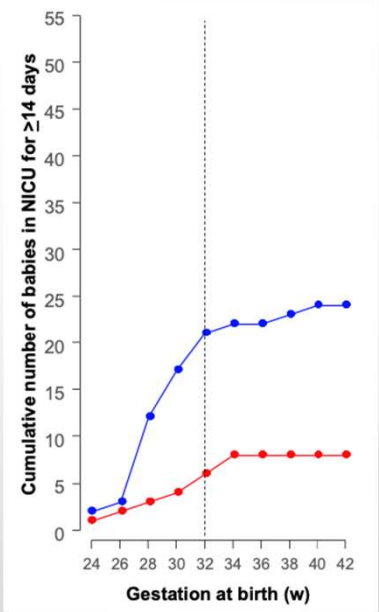
ASPRE project

Admission to NICU







AJOG American Journal of Obstetrics & Gynecology

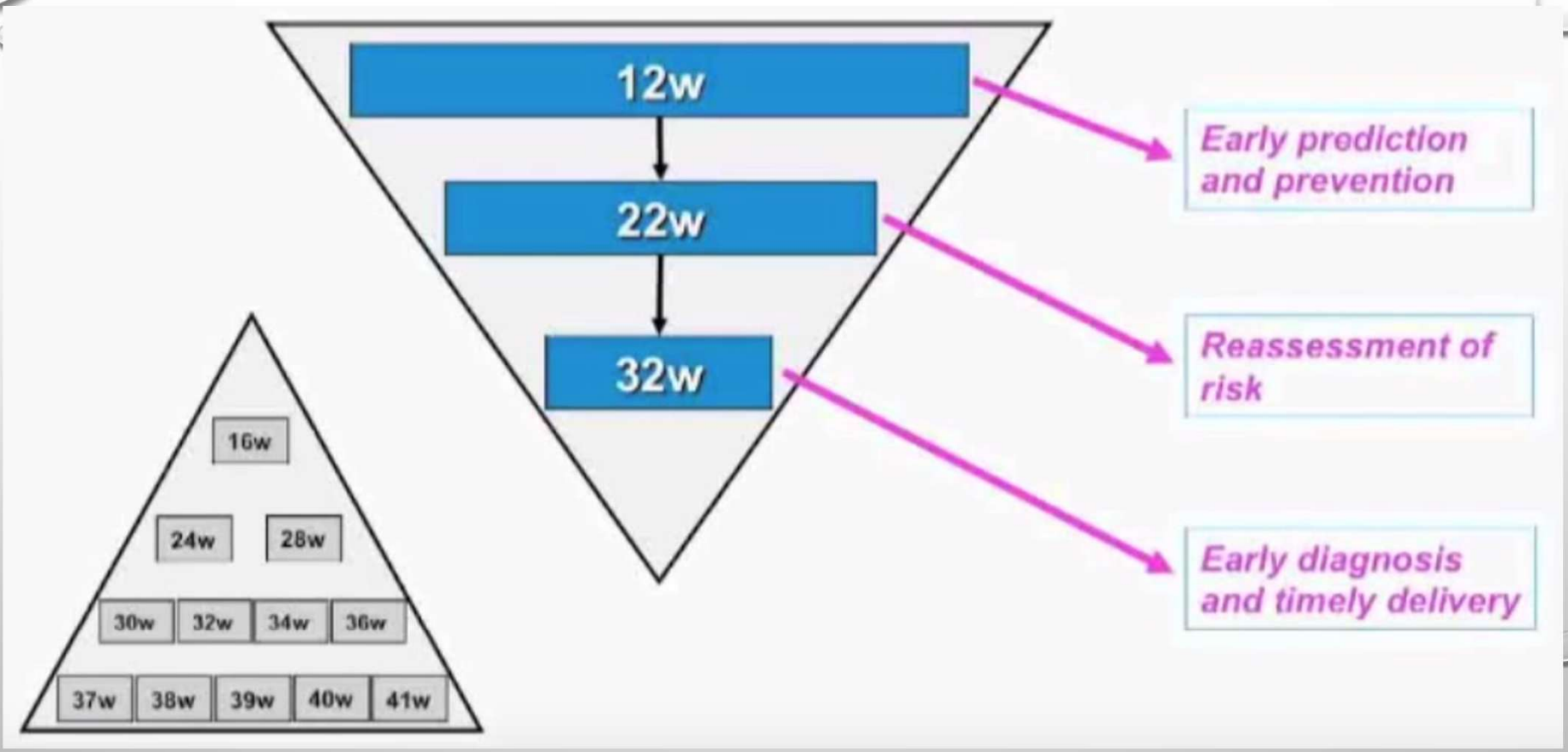
Wright *et al*. Aspirin for Evidence-Based Preeclampsia Prevention trial: effect of aspirin on length of stay in the neonatal intensive care unit. Am J Obstet Gynecol 2018, doi: 10.1016/j.ajog.2018.02.014.

The Fetal Medicine Foundation

Prevention of PE: aspirin

Aspirin >100 mg onset at <16 w:

- Reduction in PE <32 w	90%
- Reduction in PE <34 w	80%
- Reduction in PE <37 w	65%
- Reduction in abruption	30%
- Reduction in LOS in NICU	65%


12w
22w
32w
Early prediction and prevention
Reassessment of risk
Early diagnosis and timely delivery
16w
24w
28w
30w
32w
34w
36w
37w
38w
39w
40w
41w

HOME MESSAGE

- Early detection of risks factors of preeclampsia (NICE) in preterm pregnancy is about 40% only.
- If we complete the test (MAP +RF + Urt artery Doppler) is detection about 70%.
- If we complete the test (risks factors, MAP, Urt artery Doppler, biology) is detection about 90% in early preeclampsia.
- prevention by Asp treatment is efficacity in case of :
  - Correct dose
  - Regular intake
  - At first trimester

THANK YOU

TO BE CONTINUE