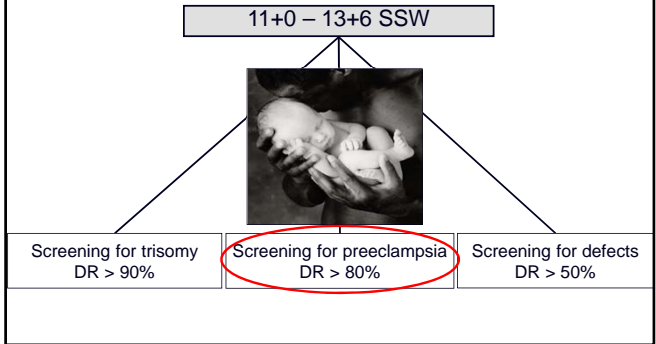


Screening for preeclampsia in the first trimester

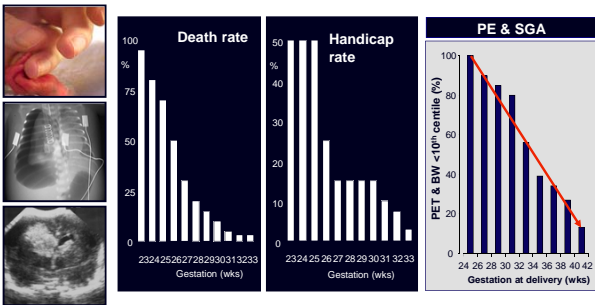


Karl Oliver Kagan, MD, PhD
University of Tuebingen, Germany

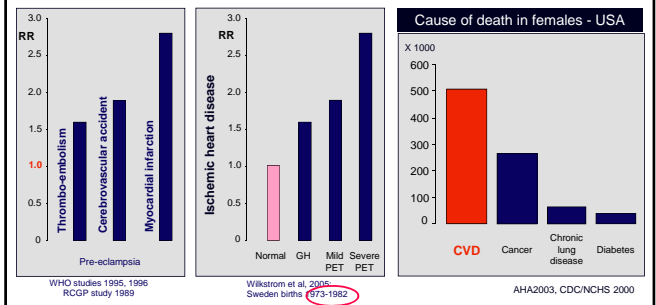
First trimester screening



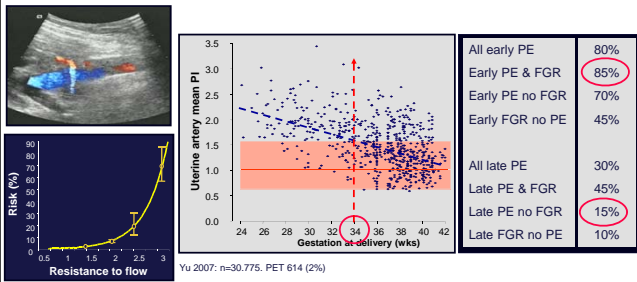
Preeclampsia and gestation: Effect on perinatal death & handicap



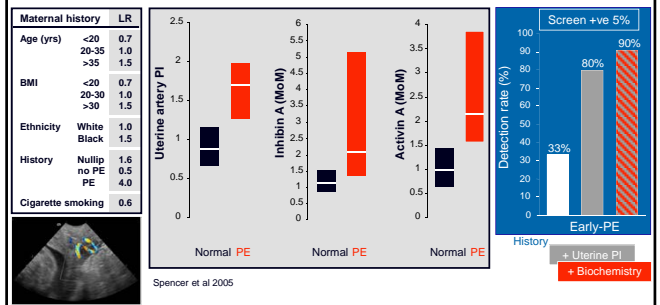
Preeclampsia & gestation: Effect on maternal mortality / morbidity



Uterine artery Doppler at 22 wks



Uterine artery Doppler & serum biochemistry at 22 wks



Prevention of preeclampsia

Calcium 1.5 g / day		
Women with low calcium intake		
DRUG	Calcium	Placebo
	4151	4161
• Pre-eclampsia	4.1%	4.5%
• Early onset PET	0.5%	0.5%
• Baby deaths	0.9%*	1.3%
Villar et al 2006		
Aspirin 150 mg/day Abnor Doppler 23w		
DRUG	Aspirin	Placebo
	280	280
• Pre-eclampsia	18%	19%
• FGR <5th Centile	22%	24%
• Abrupton	4%	2%
Yu et al 2003		
Vitamin C 1000 mg / day & Vitamin E 400 IU / day		
Low-risk (nulliparous) women		
DRUG	Vitamins	Placebo
	935	942
• Pre-eclampsia	6%	5%
• Antihypertensives	4.6%*	2.8%
• FGR (<10 th centile)	8.7%	9.9%
• Baby deaths	1.3%	1.8%
Rumbold et al 2006		
High-risk women		
DRUG	Vitamins	Placebo
	1199	1205
• Pre-eclampsia	15%	16%
• Antihypertensives	7%*	3%
• FGR (BW<2.5Kg)	28%*	24%
• Baby deaths	4%	3%
Poston et al 2006		

Screening for preeclampsia in the first trimester

NHS

National Institute for Clinical Excellence

Routine antenatal care in the UK

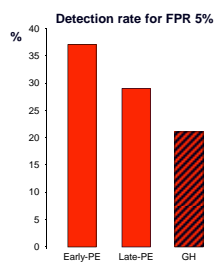
At first contact a woman's risk for preeclampsia should be evaluated so that a plan for her schedule of antenatal appointments can be formulated. 2004

Risk factors	Unaffected n=8,061	Early-PE n=37	Late-PE (n=128)	GH n=140
Nulliparity	47.0%	56.8%	60.9%	63.6%
Age ≥ 40	5.8%	8.1%	4.7%	8.6%
Family history of PE	5.5%	13.5%	12.5%	11.4%
Previous history of PE	2.5%	21.6%	15.6%	9.3%
BMI ≥ 30 Kg/m ²	14.7%	32.4%	35.9%	27.1%
Vascular disease	2.0%	16.2%	5.5%	1.4%
At least one factor	64.1%	89.2%	93.0%	85.0%

Poon et al 2009: Prospective screening n=9,149 women

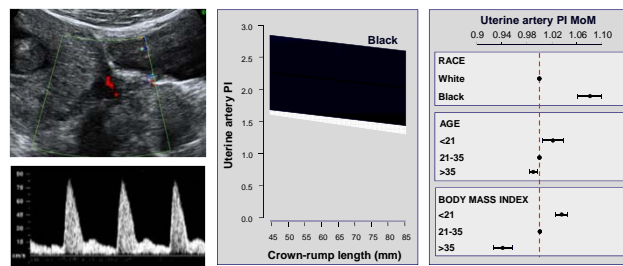
Screening for preeclampsia in the first trimester Maternal history: a priori risk

Independent variable	Adjusted OR (95% CI)		
	Early-PE	Late-PE	GH
Maternal age (yr)	-	1.04 (1.00-1.07)	1.04 (1.01-1.07)
BMI (Kg/m ²)	-	1.10 (1.07-1.13)	1.10 (1.07-1.13)
Racial origin			
Black	3.64 (1.84-7.21)	2.97 (1.98-4.46)	-
Indian or Pakistani	-	2.66 (1.29-5.48)	-
Mixed	-	3.31 (1.55-7.06)	-
Parous			
No previous PE	0.31 (0.14-0.71)	0.24 (0.15-0.38)	0.29 (0.20-0.43)
Previous PE	4.02 (1.58-10.24)	2.18 (1.24-3.83)	-
Maternal history of PE	-	2.91 (1.63-5.21)	2.64 (1.51-4.62)
History of hypertension	8.70 (2.77-27.33)	-	-
Ovulation drugs	4.75 (1.55-14.53)	-	-

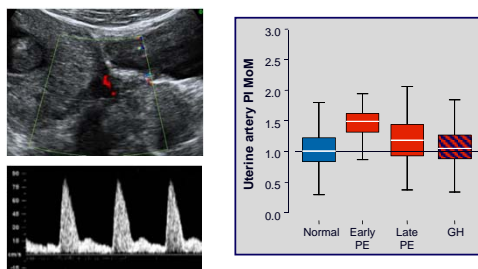


9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%

Screening for preeclampsia in the first trimester Uterine artery Doppler at 11-13 wks

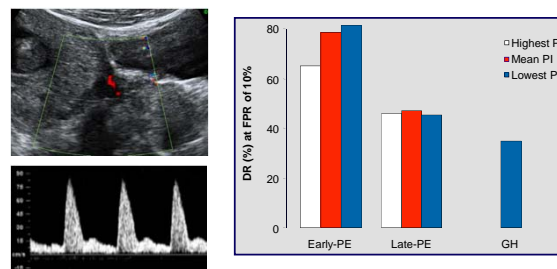


Screening for preeclampsia in the first trimester Uterine artery Doppler at 11-13 wks



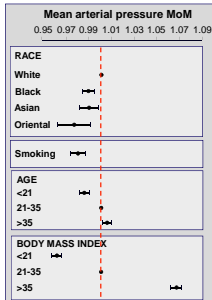
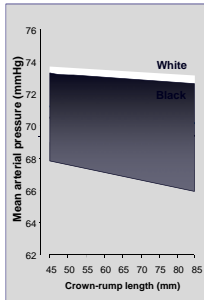
9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%

Screening for preeclampsia in the first trimester Uterine artery Doppler at 11-13 wks

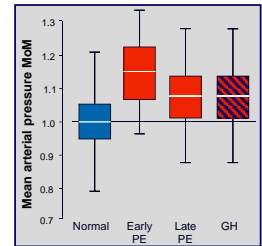


9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%

Screening for preeclampsia in the first trimester Blood pressure at 11-13 wks



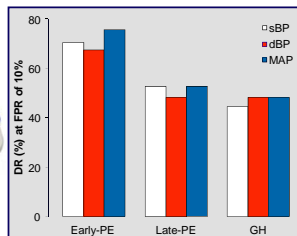
Screening for preeclampsia in the first trimester Blood pressure at 11-13 wks



$MAP = \text{Diastolic BP} + (\text{Systolic BP} - \text{Diastolic BP}) / 3$

9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%

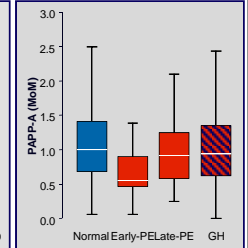
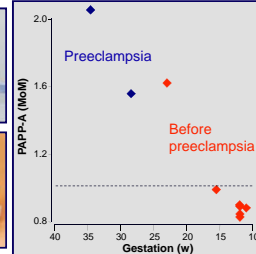
Screening for preeclampsia in the first trimester Blood pressure at 11-13 wks



$MAP = \text{Diastolic BP} + (\text{Systolic BP} - \text{Diastolic BP}) / 3$

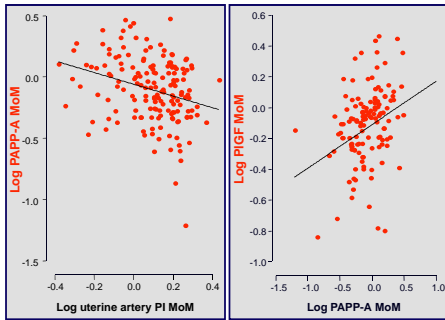
9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%

Screening for preeclampsia in the first trimester Pregnancy associated plasma protein-A at 11-13 wks

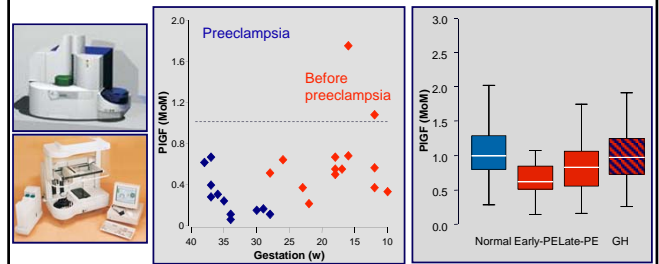


Ong 2000, Yaron 2002, Spencer 2005, Spencer 2006, Spencer 2007, Spencer 2008, Kang 2008, Bersinger 2003, Bersinger 2004, Poon 2009, Devict 2009.

Screening for preeclampsia in the first trimester Pregnancy associated plasma protein-A at 11-13 wks

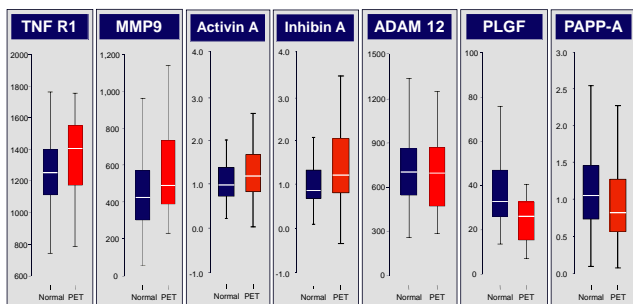


Screening for preeclampsia in the first trimester Placental growth factor in maternal blood at 11-13 wks

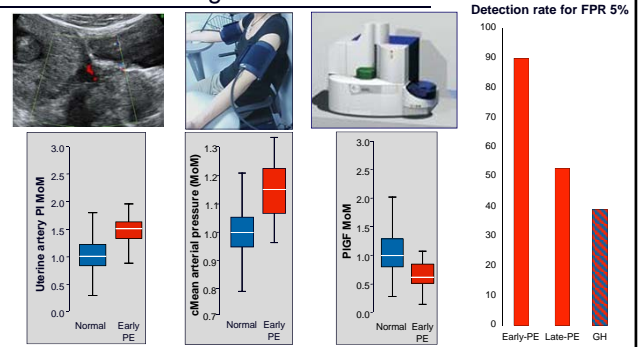


Torry 1998, Reuvekam 1999, Livingston 2001, Taylor 2003, Masuyam 2005, Crispi 2006, Ohkuchi 2007, Teixeira 2008, Tjoe 2001, Su 2001, Tidwell 2001, Pillotti 2003, Krauss 2004, Crispi 2008, Erez 2008, Ong 2001, Thadani 2003.

Screening for preeclampsia in the first trimester Maternal serum biochemistry at 11-13 wks

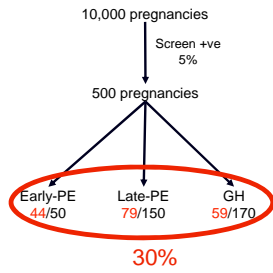
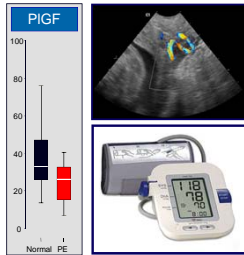


Screening for preeclampsia in the first trimester combined screening at 11-13 wks



Screening for preeclampsia in the first trimester combined screening at 11-13 wks

9,149 pregnancies; Early-PE 0.5% Late-PE 1.5% GH 1.7%



FMF - Software

The screenshot shows the 'Risks / Counselling' tab of the FMF software. It includes a 'Calculate' button and a table of risks for Trisomy 21, Trisomy 18, and Trisomy 13. Below the table are fields for 'Risk for early preeclampsia', 'Risk for preeclampsia at any gestation', and 'Risk for all hypertensive disorders'. A note at the bottom explains that the background risk is based on maternal age and the adjusted risk is based on maternal history, uterine Doppler, mean arterial pressure (MAP), and PAPP-A.

	Trisomy 21	Trisomy 18	Trisomy 13
Background risk	1: 320	1: 725	1: 2289
Adjusted risk	1: 760	1: 6582	1: 4313

Risks of hypertensive disorders: 1: 259
 Risk for early preeclampsia: 1: 108
 Risk for preeclampsia at any gestation: 1: 108
 Risk for all hypertensive disorders: 2%

Thank you