

# Screening de CIR: Es realment efectiu?

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# Why is important to detect FGR?

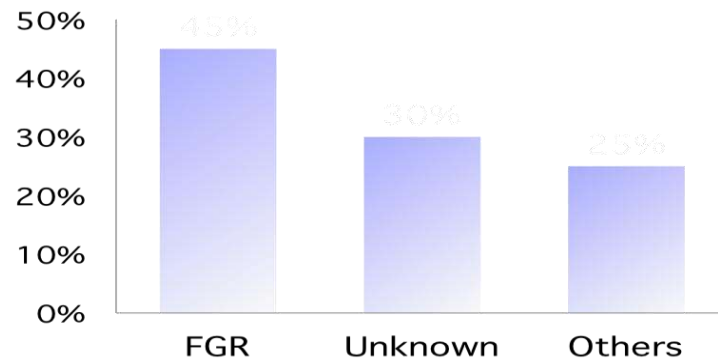
Classification of stillbirth by relevant condition at birth (ReCoDe):

IMPACT OF NON-DETECTED FGR ON LATE FETAL MORTALITY

2625 stillbirths (5.82/1000 births)

1738 unexplained stillbirths (Wigglesworth classification):

1002 (57%) were re-classified FGR



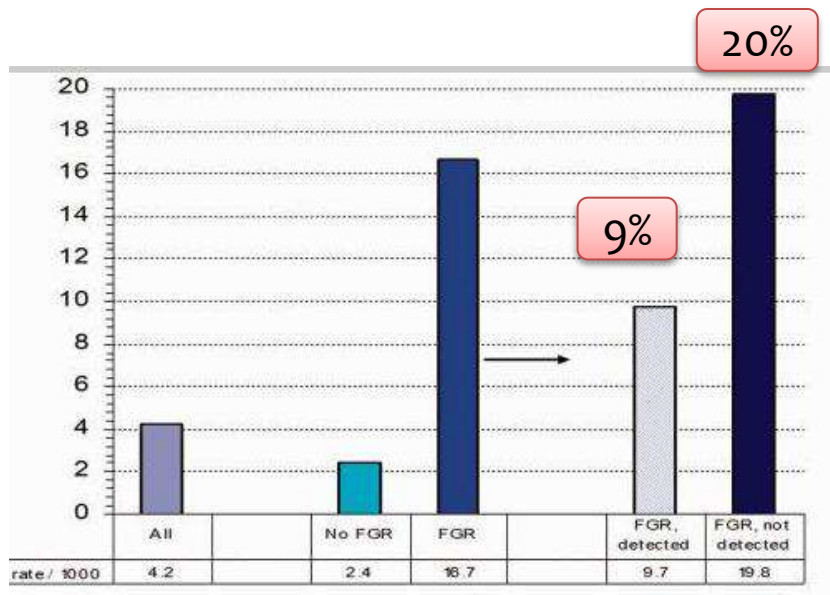
Single largest factor FOR STILLBIRTH is fetal growth restriction

FGR: 7 fold higher risk for stillbirth

*Gardosi et al. BMJ 2005*

# Why is important to detect FGR?

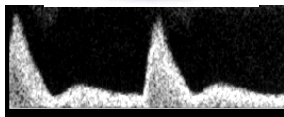
## ReCoDe



**PREDICTION?**

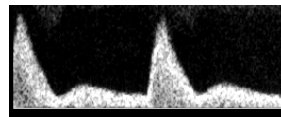
# SCREENING SGA/FGR

## FIRST TRIMESTER



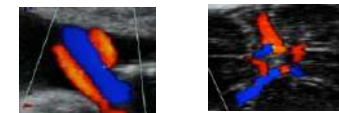
Usefulness of first  
trimester screening  
Aspirin prophylaxis

## SECOND TRIMESTER



Usefulness of  
sistematic second  
trimester UtA  
Doppler

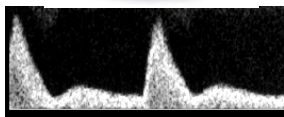
## THIRD TRIMESTER



Universal  
screening?  
When?

# SCREENING SGA/FGR

## FIRST TRIMESTER



Usefulness of first trimester screening for FGR  
Aspirin prophylaxis

## FIRST TRIMESTER

Maternal  
factors



*Poon, 2010*

30%

Biophysical  
parameters



*Martin, 2001; Gómez  
2005; Poon, 2009-10-11;  
Schazzocchio 2013*

40%

Biochemical  
markers



*Akilekar 08; Poon, 2009,  
Kuc 13*

40%

**Combined algorithm**

## FGR+PE vs isolated FGR

	AUC (CI 95%)	DR (%) for a FPR of:	
		5%	10%
<b>FGR with PE (n=85, 18.4%)</b>			
A priori risk ( $\log_{10}$ )	0.582 (0.518-0.646)	7.1	<b>12.9</b>
A priori, MAP, mean UtA PI	0.786 (0.732-0.840)	32.9	<b>44.7</b>
A priori, MAP, mean UtA PI, sFlt-1/PIGF ratio	0.854 (0.792-0.916)	71.8	<b>74.1</b>
<b>FGR without PE (n=377, 81.6%)</b>			
A priori risk ( $\log_{10}$ )	0.706 (0.677-0.735)	31	<b>41.4</b>
A priori, MAP, mean UtA PI	0.714 (0.684-0.744)	28.6	<b>41.1</b>
A priori, MAP, mean UtA PI, sFlt-1/PIGF ratio	0.756 (0.721-0.792)	54.1	<b>62.1</b>

# Low-dose aspirin for preeclampsia prevention

The **NEW ENGLAND**  
**JOURNAL** of **MEDICINE**

ESTABLISHED IN 1812

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VOL. 377 NO. 7

## Aspirin versus Placebo in Pregnancies at High Risk for Preterm Preeclampsia

Daniel L. Rolnik, M.D., David Wright, Ph.D., Liona C. Poon, M.D., Neil O’Gorman, M.D., Argyro Syngelaki, Ph.D., Catalina de Paco Matallana, M.D., Ranjit Akolekar, M.D., Simona Cicero, M.D., Deepa Janga, M.D., Mandeep Singh, M.D., Francisca S. Molina, M.D., Nicola Persico, M.D., Jacques C. Jani, M.D., Walter Plasencia, M.D., George Papaioannou, M.D., Kinneret Tenenbaum-Gavish, M.D., Harnutal Meiri, Ph.D., Sveinbjorn Gizurarson, Ph.D., Kate Maclagan, Ph.D., and Kypros H. Nicolaides, M.D.

- ✓ 1610 gestants.
- ✓ 11-14 SG → 36 SG.
- ✓ AAS 150mg vs Placebo



Combined pre-eclampsia screening at 11–13+6 weeks



High risk

Aspirin

70% SGA in PE < 37w  
85% SGA in PE < 32w

early pre-eclampsia

preterm pre-eclampsia

✓ OR: 0,18

✓ OR: 0,38



# Prediction and prevention of small-for-gestational-age neonates: evidence from SPREE and ASPRE



Combined pre-eclampsia screening at 11–13+6 weeks

46%  
Of preterm SGA

56%  
Early SGA



High risk



Aspirin

40% Drop in SGA <37w    73% Drop in SGA <32w

PREECLAMPSIA

70% Drop in SGA <37w    90% Drop in SGA <32w

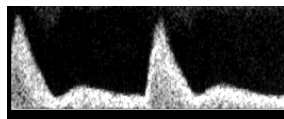
OVERALL SGA

20% Drop in SGA <37w    40% Drop in SGA <32w

SGA delivering at term at not predictable nor preventable by AAS

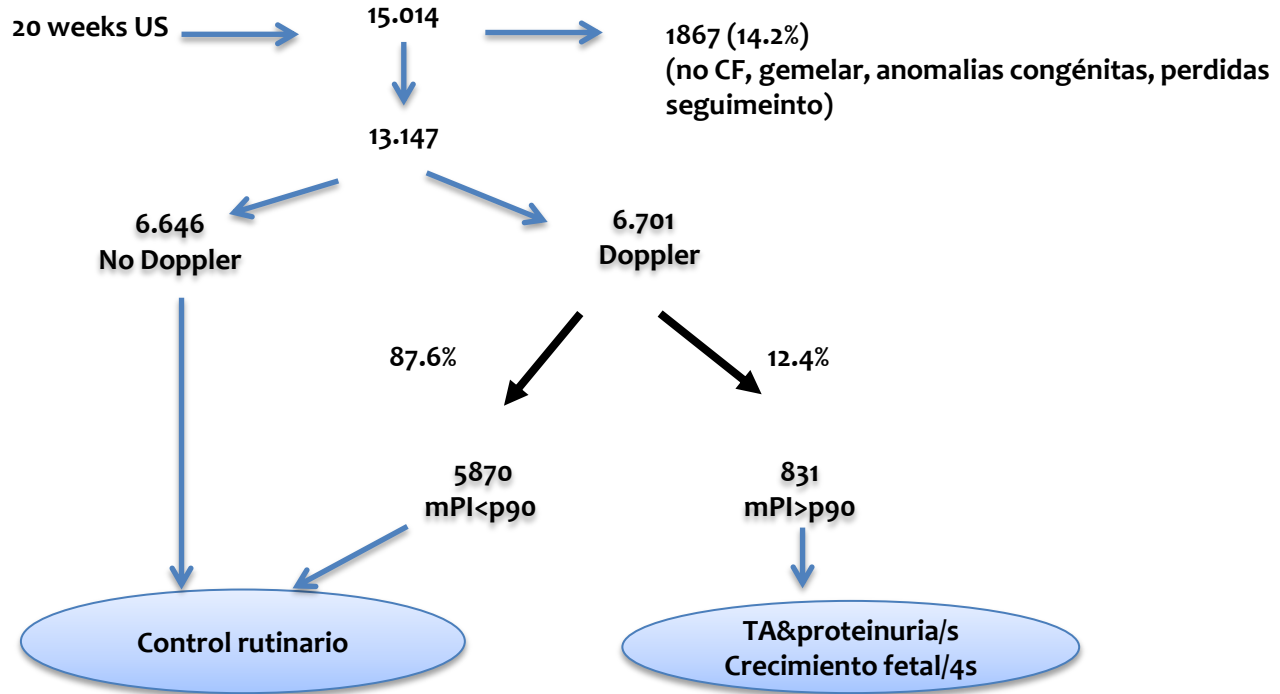
# SCREENING SGA/FGR

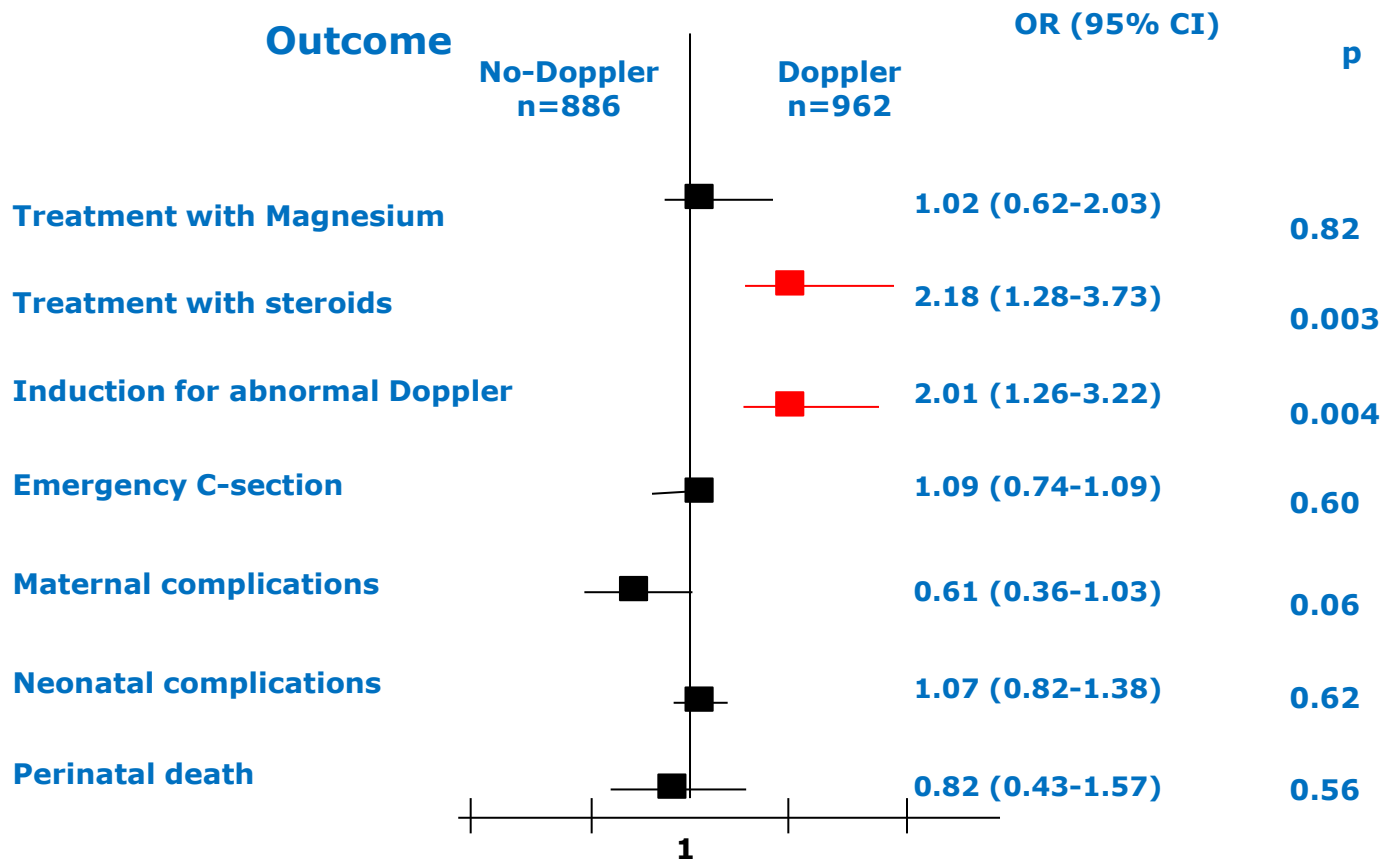
## SECOND TRIMESTER



Usefulness of sistematic second trimester  
UtA Doppler

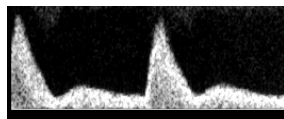
# Do knowledge of uterine artery resistance in the second trimester and targeted surveillance improve maternal and perinatal outcome? UTOPIA study: a randomized controlled trial.





# SCREENING SGA/FGR

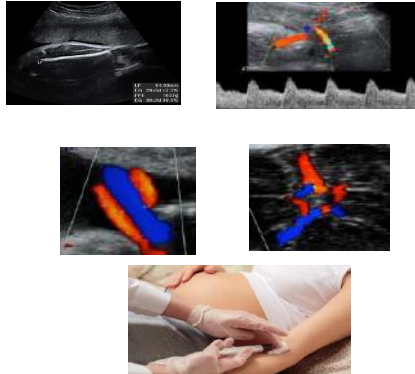
## SECOND TRIMESTER



Second trimester UtA Doppler:  
high-risk pregnancies

# SCREENING SGA/FGR

## THIRD TRIMESTER

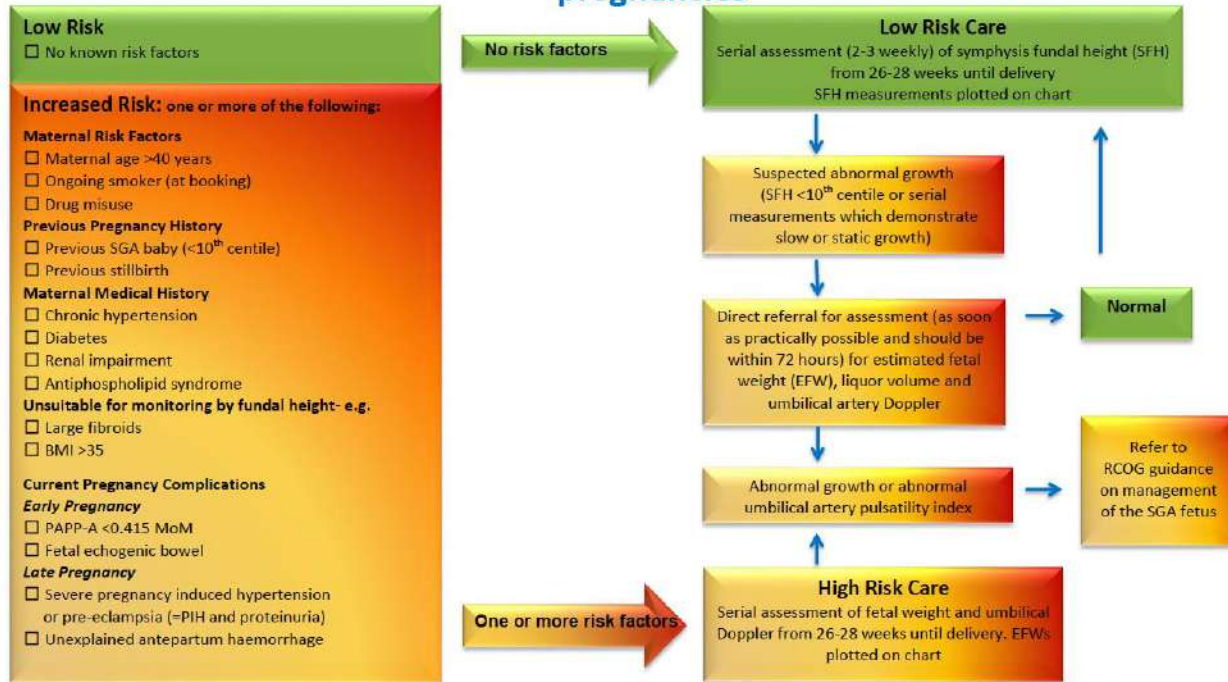


Universal screening?  
When?

## McCowan. Evidence-based national guidelines for management of suspected fetal growth restriction. Am J Obstet Gynecol 2018

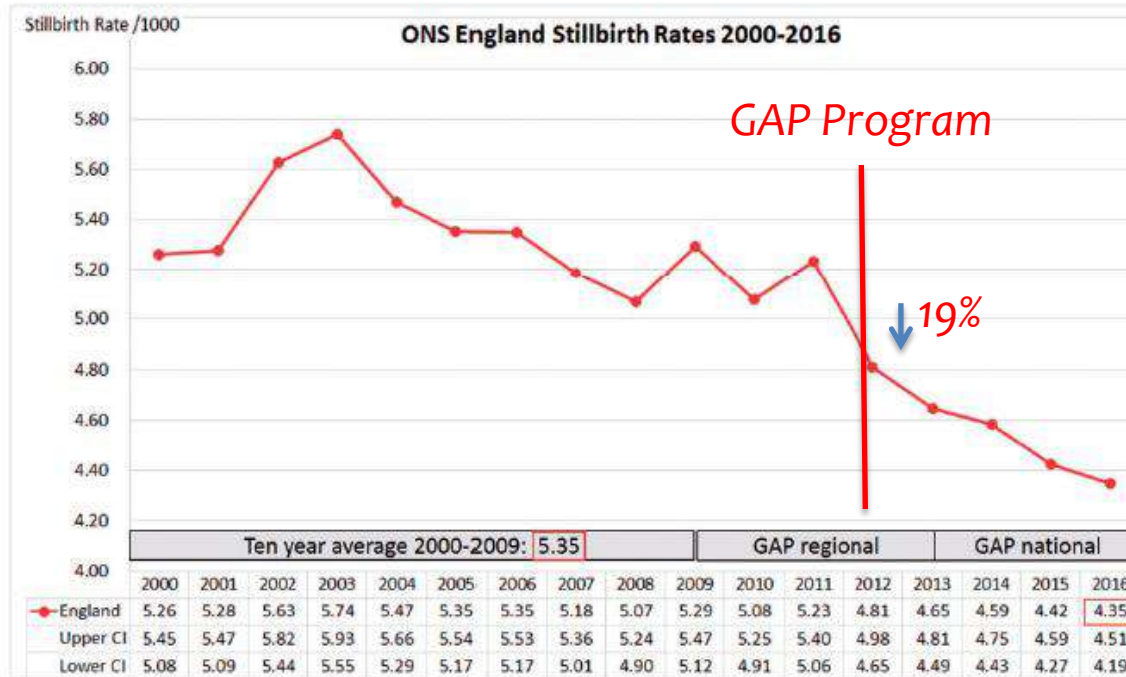
Country	UK (2013)	NZ (2014)	CND(2013)	IR (2017)	USA (2013)	France (2015)
≥3 US in low risk women	NR	NR	NR	NR	NR	Recommend at 32 w
Serial scanning	>1 major risk factors, abnormal UtA	>1 major risk factors or not able fundal height monitoring	Not specified	>1 major risk factors	Previous FGR, or not able fundal height monitoring	Not specified
Biometry charts	EFW customized chart	EFW customized chart	EFW or AC on population chart, not specified	EFW customized chart, biometry chart not specified	EFW and biometries, chart not specified	EFW customized, biometry using French population ultrasound charts
Interval scans SGA/FGR	3w	2-3 w	2w	2-4 w	3-4 w	3 w

## Algorithm and Risk Assessment Tool: Screening and Surveillance of fetal growth in singleton pregnancies





# Trend in stillbirth rates in England after Growth Assessment Protocol (GAP)

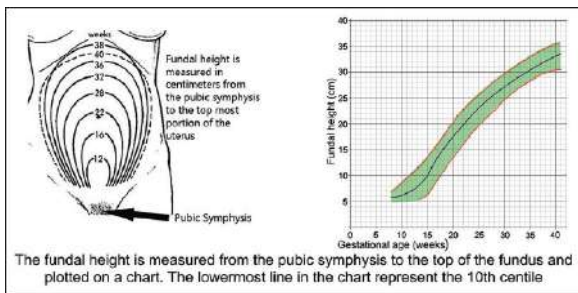


SGA DR  
42%

## Low-risk population: prediction

**Fundal height measurement**

Low detection rate (25-30%)



Lindhard A, BJOG, 1990

Bais MJM, Eur J Obstet Gynecol Reprod Biol 2004

Goto E. Meta-analysis 46 studies. J Epidemiol Community Health, 2013

**Routine ultrasound**

POP study: detection of SGA  
3977 28 and 36 weeks of gestation  
20% selected vs 57% universal US



Solvio U, Lancet 2015

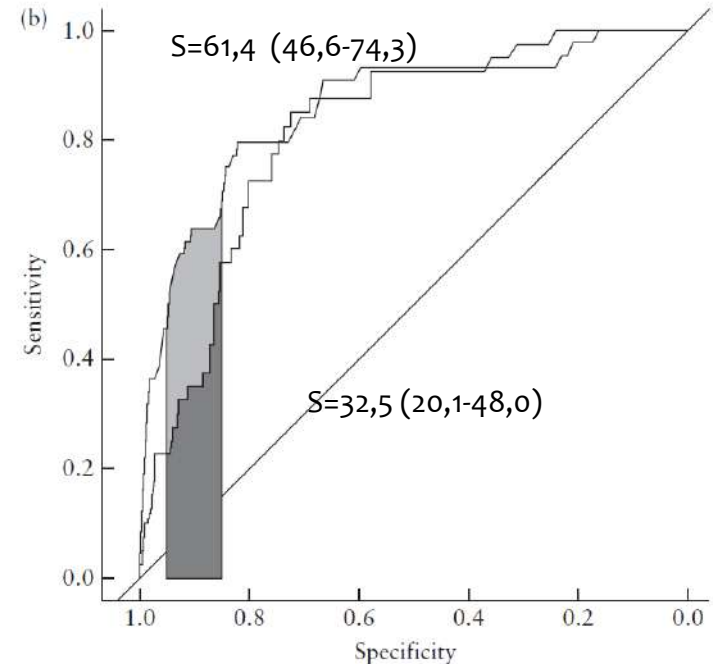
## Ultrasound screening for fetal growth restriction at 36 vs 32 weeks' gestation: a randomized trial (ROUTE)

Third trimester routine scan

1272 women  
32 w

1314 women  
36 w

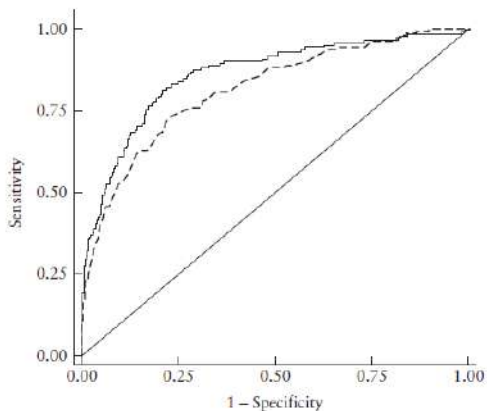
<b>DR</b>	<b>32,5%</b>	<b>61,4%</b>
FPR	8,5%	8,7%
LR+	3,7	7,2
LR-	0,74	0,40



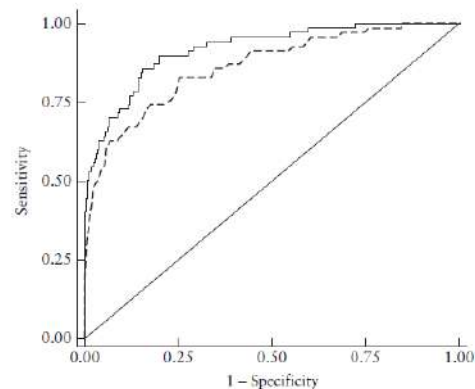
# Prediction of small for gestational age neonates: screening by maternal factors, fetal biometry, and biomarkers at 35–37 weeks' gestation

Crovetto F, UOG, 2016

SGA



FGR

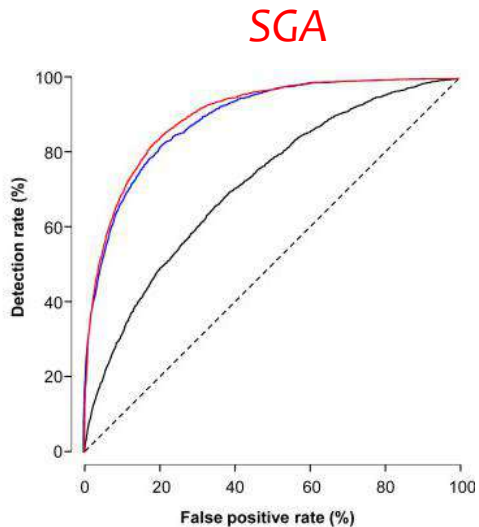


SCREENING TEST	DR (10% SPR)
EFW	52%
MF+EFW	56%
MF+EFW+PIGF+UtA +lipocalin+estriol	61%

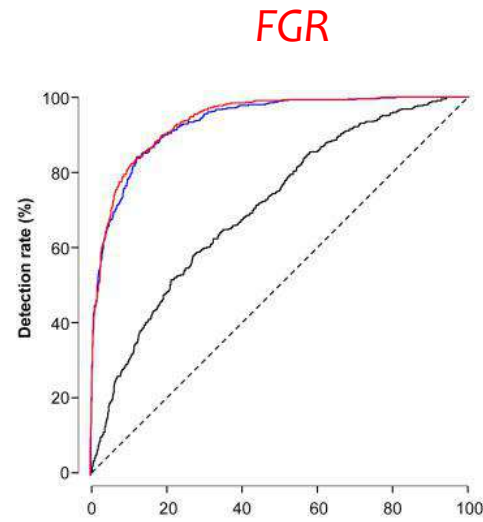
SCREENING TEST	DR (10% SPR)
EFW	64%
MF+EFW	64%
MF+EFW+PIGF+UtA +lipocalin+estriol	77%

# Prediction of small for gestational age neonates: screening by maternal factors, fetal biometry, and biomarkers at 35–37 weeks' gestation

Ciobanu A, Am J Obstet Gynecol, 2019.



SCREENING TEST	DR (10% SPR (95% CI))
Maternal factors	30(27-33)
MF+EFW	67 (64-70)
MF+EFW+PI GF	70 (67-72)



SCREENING TEST	DR (10% SPR (95% CI))
Maternal factors	37 (32-42)
MF+EFW	76 (71-80)
MF+EFW+PI GF	77 (73-82)

## Cribratge de preeclàmpsia en el primer trimestre: Universal

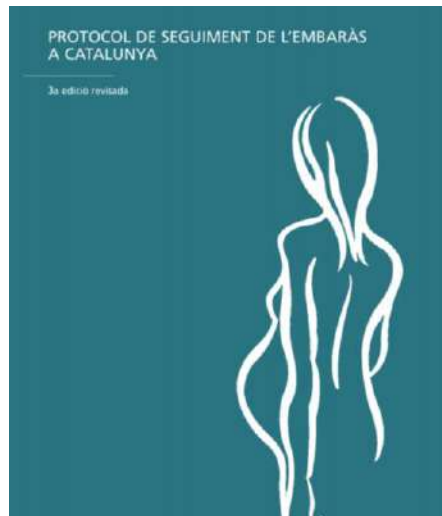
- Factors de risc (preeclàmpsia prèvia, síndrome antifosfolípid, IMC, diabetis mellitus tipus I, paritat, edat, malalties renals, malalties autoimmunes) + TA + Doppler de les arteries uterines + PAPP-A
- En els casos amb resultat positiu es recomana prescriure 150 mg d'àcid acetil salicílic al dia.

## Cribratge de segon trimestre: Seleccionat a les pacients de risc

- Antecedents obstètrics desfavorables (preeclàmpsia precoç, despreniment prematur de la placenta no inserida, retard de creixement intrauterí, mort intrauterina), HTA prèvia, HTA gestacional, malaltia renal, diabetis mellitus de tipus 1 amb complicacions vasculars.
- Es considera patològic si l'índex de pulsatilitat mitjà és superior al percentil 95.

## Cribratge de tercer trimestre : Universal

- L'objectiu fonamental d'aquesta ecografia és el diagnòstic de la restricció de creixement i la detecció d'anomalies fetals tardanes, evolutives o que han passat inadvertides a l'ecografia morfològica del segon trimestre



## Take home messages

- First-trimester screening for PE identifies a high proportion of cases of **preterm SGA** that can be prevented by **AAS**
- About 85% of SGA neonates are born at term. **SGA delivering at term** are not predictable nor preventable by AAS
- Effective screening for **late SGA** is provided by **a combination of maternal factors and fetal biometry at 35<sup>+0</sup>–36<sup>+6</sup> w.**
- Screening later in pregnancy **reduce perinatal mortality and morbidity** associated with SGA through close monitoring, appropriate timing of delivery and prompt neonatal care.

*Gràcies!*



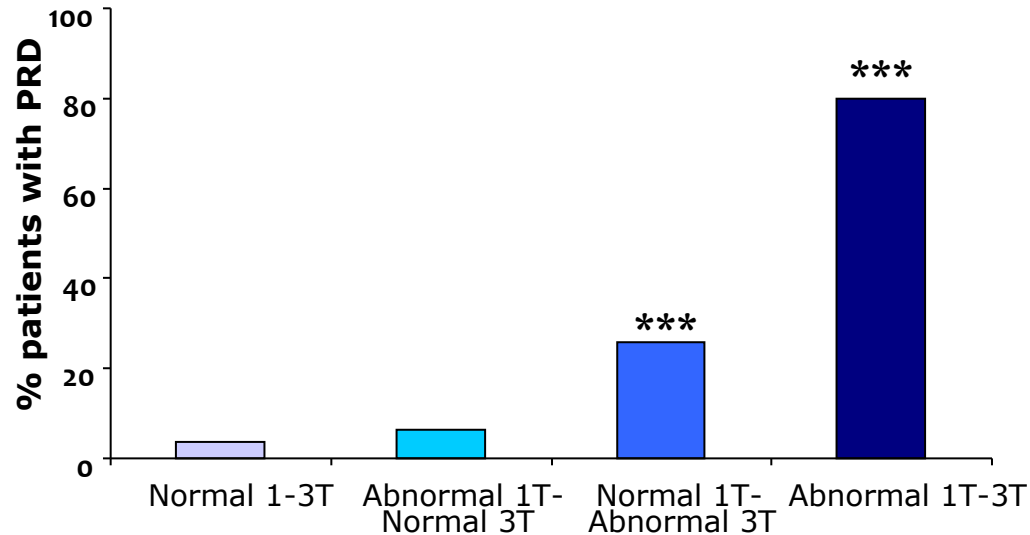
[ellurba@santpau.cat](mailto:ellurba@santpau.cat)



## Effectiveness of ultrasound biometry at 34-36 weeks in the detection of SGA at birth

Weeks' gestation	34	35	36
N (pregnancies with a 'last scan')	12,612	10,285	17,301
% of all cases scanned at 34-36 weeks	31.4	25.6	43.1
SGA rate at birth (%)	14.1	18.4	19.3
Detection rate (DR)	19.0	33.6	36.1
False positive rate (FP)	1.3	3.7	3.5
Positive predictive value (PPV)	71.1	67.3	71.3
Negative predictive value (NPV)	88.1	86.5	86.4
Gestational age at delivery if EFW <10	262.4	268.5	270.0
Gestational age at delivery if EFW >10	277.3	276.5	277.3

## Concordance between 1st and 3rd trimester abnormal mUtA-PI z-scores.



mUtA_Pi z-scores		Third Trimester	
		Normal (<2SD)	Abnormal ( $\geq 2SD$ )
First Trimester	Normal (<2SD)	878	31
	Abnormal ( $\geq 2SD$ )	31	5

Prediction of small-for-gestational-age neonates: screening by biophysical and biochemical markers at 19 · 24 weeks

