O Estudo dos Fetos pequenos na abordagem Perinatal

Dr. Matheus Beleza

Brasília, 27 de Maio de 2021

Caso Clínico 1

G1, 23 anos, sem patologias prévias.

Pré-natal sem intercorrências.

Último ultrassom:
37s + 2d
PFE: 2350g (percentil 2)
Doppler normal

*Parto vaginal com doula com 37+5
Sofrimento fetal intra-parto
Cesárea de urgência

Caso Clínico 2

G2C1, 35 anos, sem patologias prévias.

Pré-natal:

- Pré-eclâmpsia de difícil controle desde 25 sem.
- Peso no Percentil 1 com 28 semanas.
- Doppler alterado desde 30 sem.

Último ultrassom:
31s + 4 dias
PFE: 1400g (percentil 2)
Doppler alterado - Monitorizando DV

Cesárea marcada com 32 semanas

Por quê os bebês pequenos nos preocupam tanto?


RISCO FETAL x RISCO NEONATAL

RISCO FETAL

X

RISCO NEONATAL

Devo fazer o parto???

Posso esperar?

Prematuridade iatrogênica
(↑ Morbimortalidade)

Óbito intra-útero

Saving Babies' Lives
A care bundle for reducing stillbirths

- Reducing smoking in pregnancy
- Raising awareness of reduced movements
- Effective monitoring in labour
- Risk assessment for growth restriction
- Reducing preterm birth

→ Não é possível quantificar.

→ 5 - 7% dos óbitos perinatais.

→ **↑ Incidência**

MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

NHS England

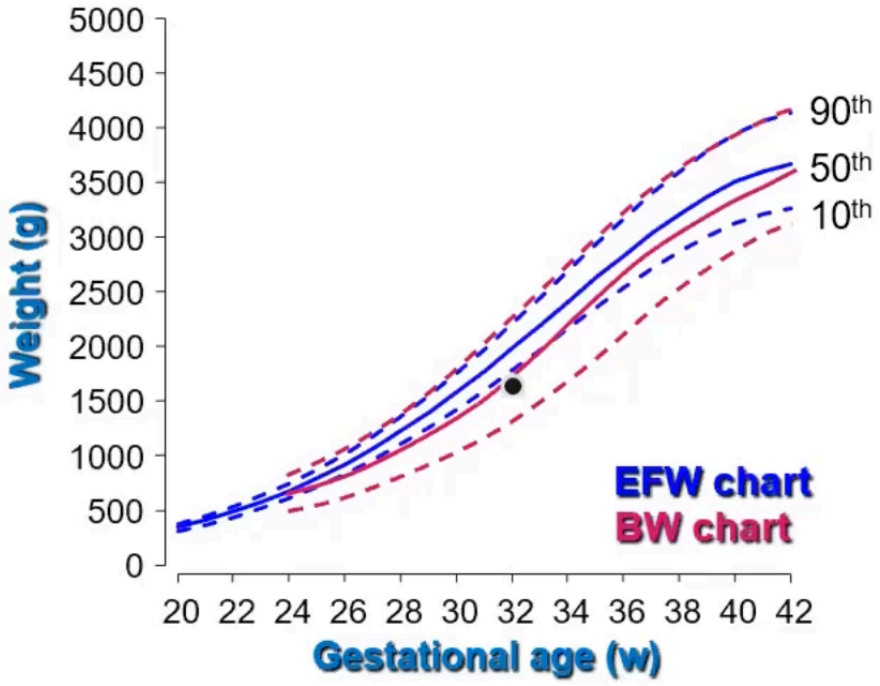
Qual curva de crescimento utilizar:

NEONATAL x FETAL

↓ detecção dos bebes restritos na prematuridade

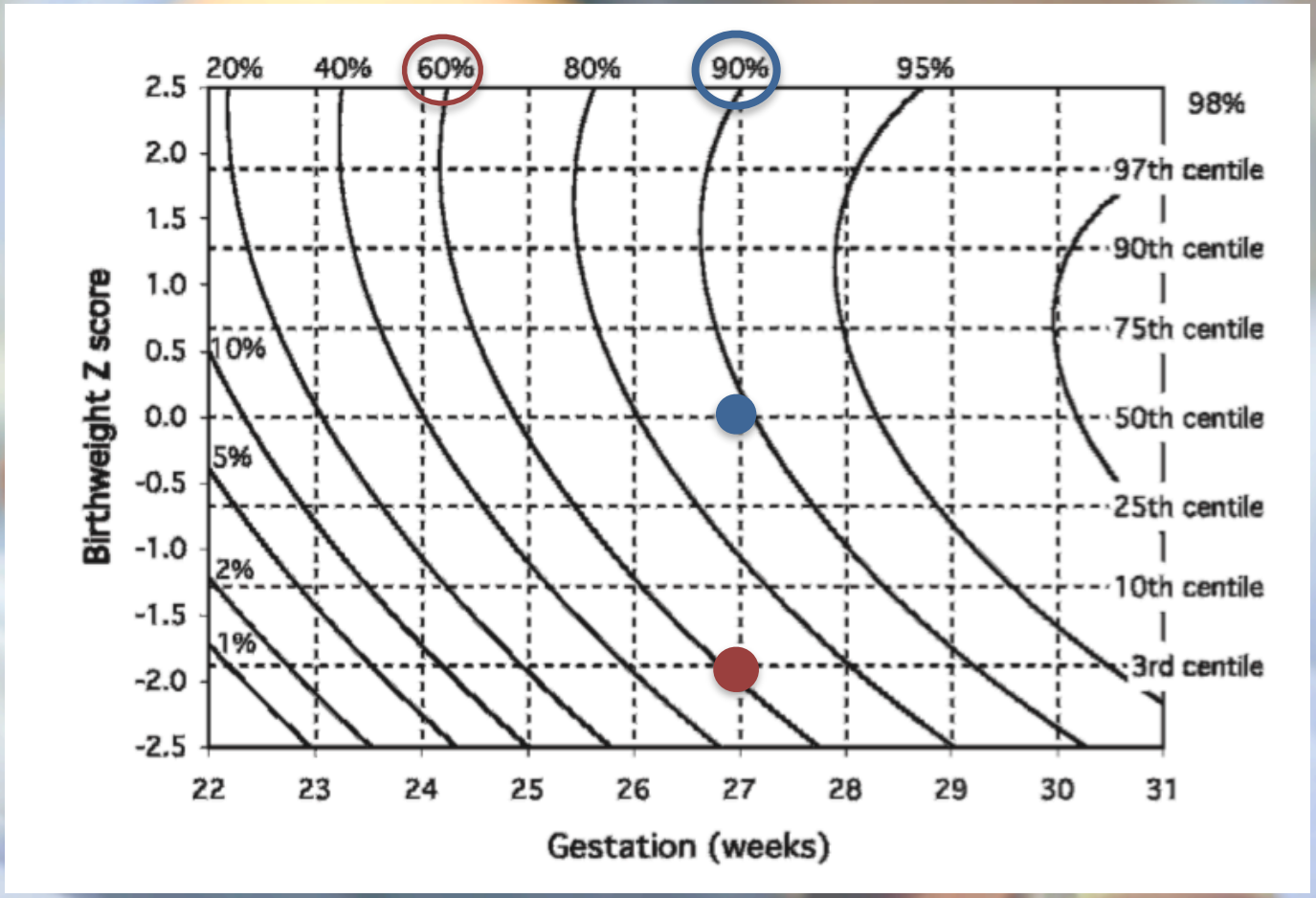
Utiliza como referência bebês prematuros, que por definição são doentes (Sd. da Prematuridade)

In reported reference ranges the media
with gestational age for babies born pr
substantially lower than that of the EFW.



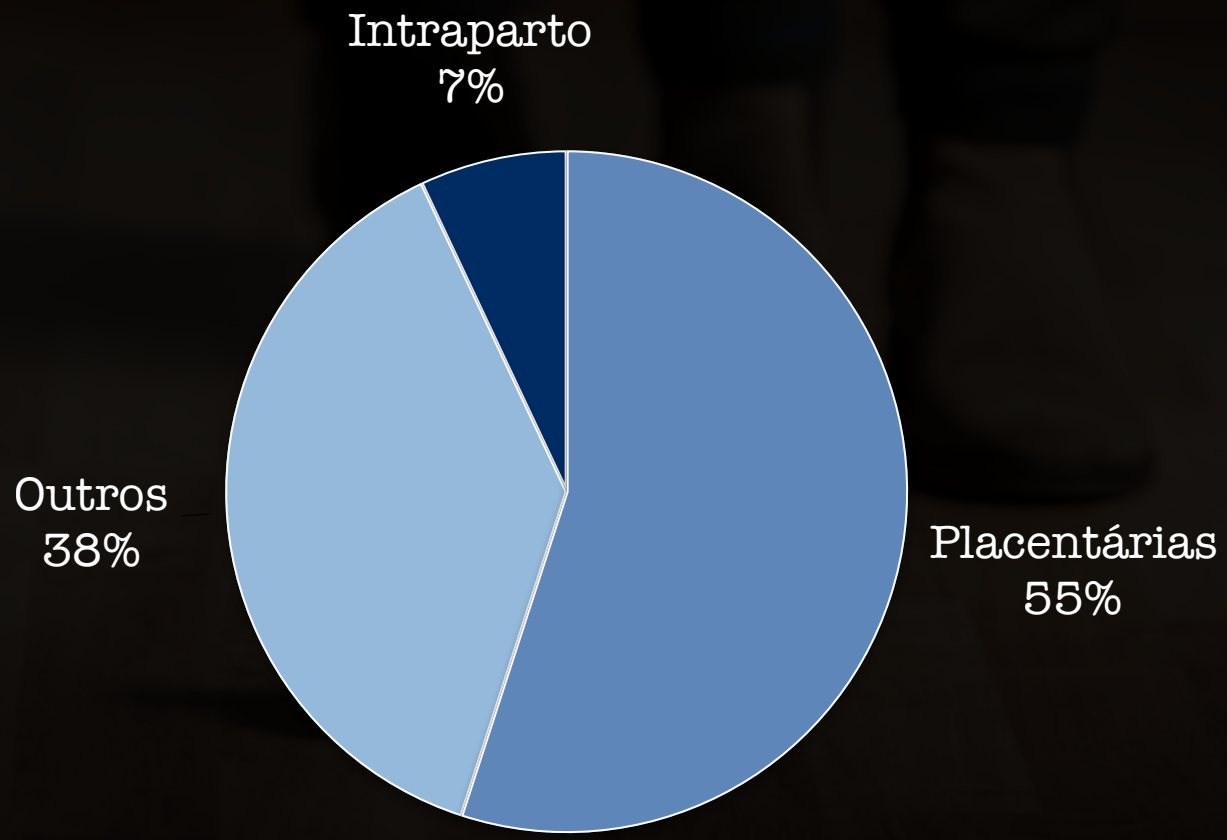
Nicolaides KH, et al. Fetal Medicine Foundation fetal and neonatal population weight charts. Ultrasound Obstet Gynecol. 2018

Impacto do peso fetal na **Sobrevida neonatal**



Cole T. J, et al. The PREM score: a graphical tool for predicting survival in very preterm births. Archives of Disease in Childhood - Fetal and Neonatal Edition, 2009.

Principais causas de **Natimortalidade**

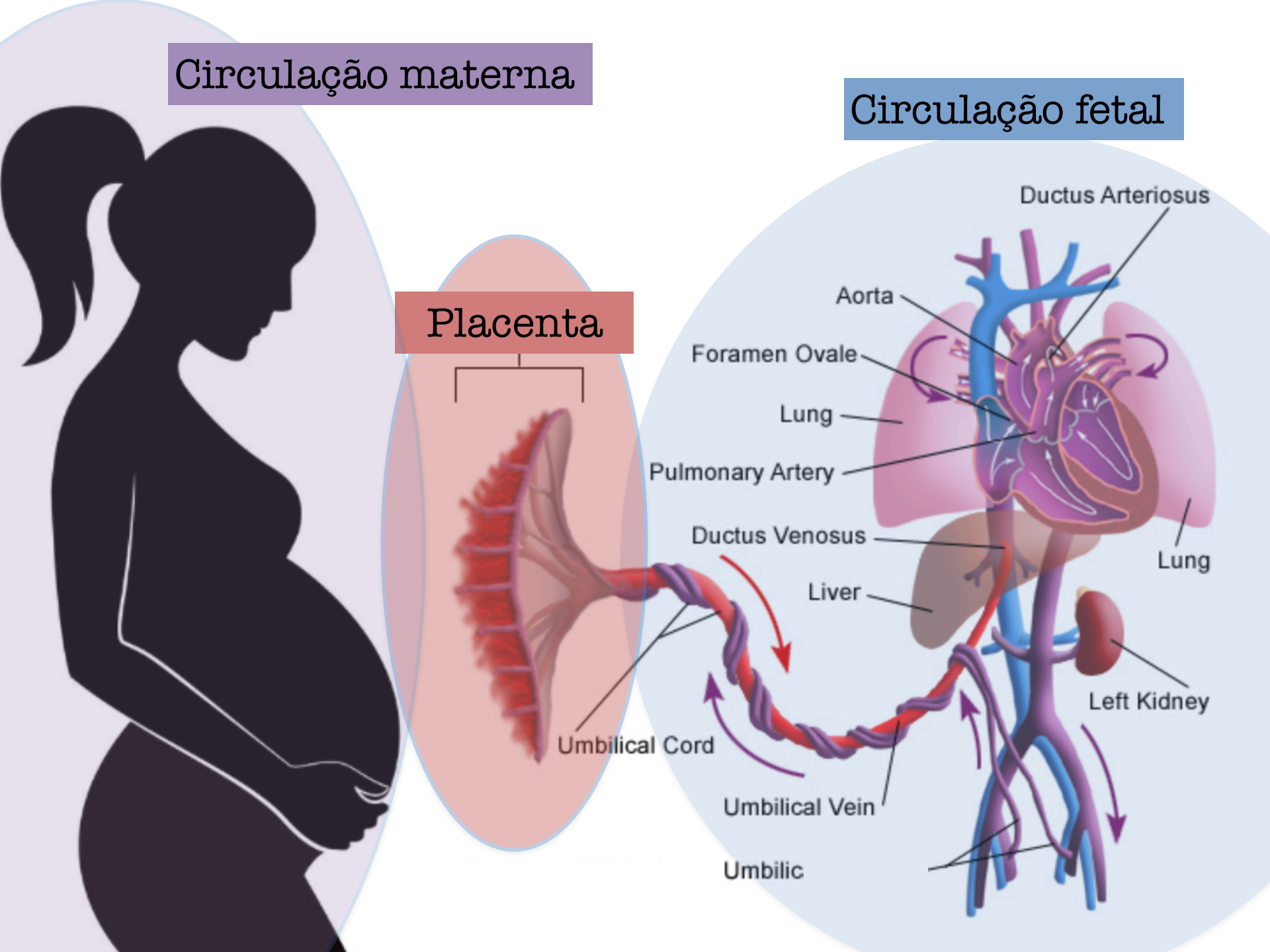


Townsend R, et al. Can risk prediction models help us individualise stillbirth prevention? A systematic review and critical appraisal of published risk models. BJOG : an international journal of obstetrics and gynaecology. 2020

Circulação materna

Placenta

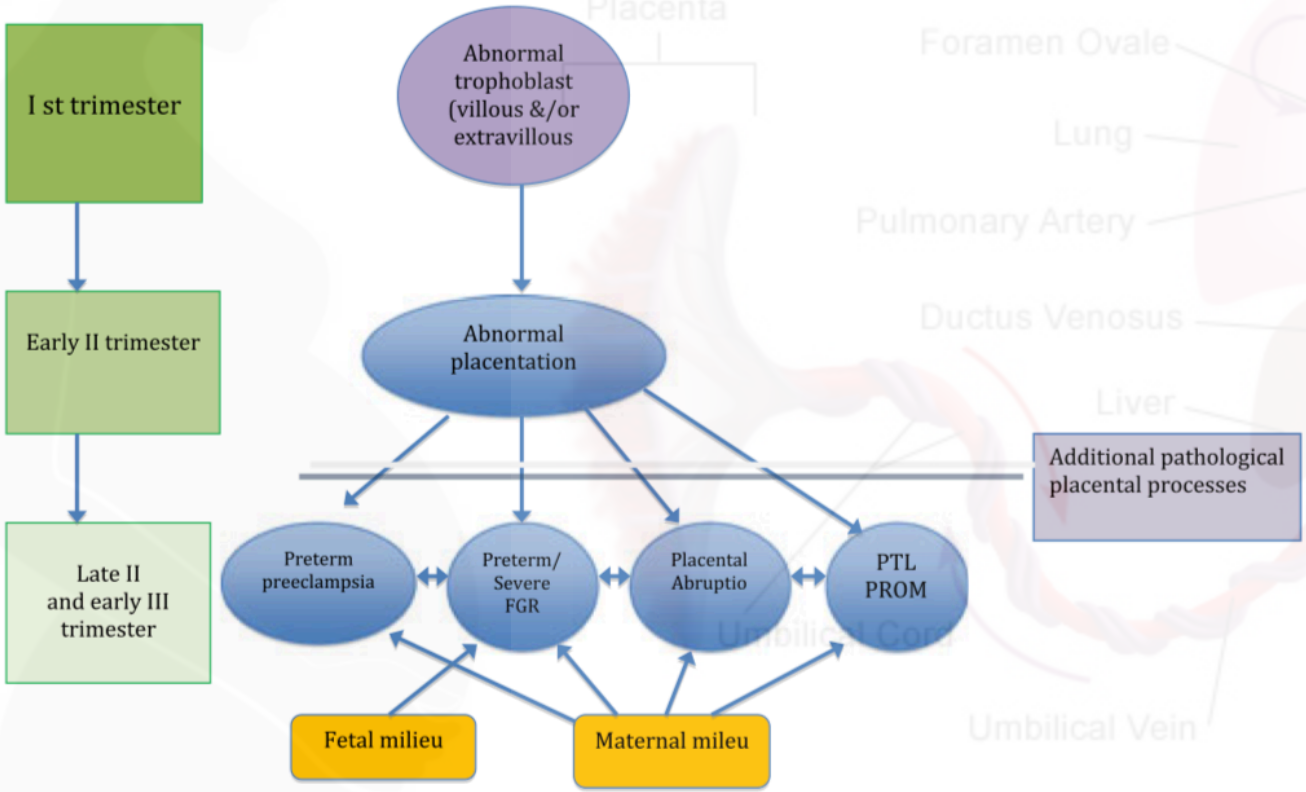
Circulação fetal



Can prenatal screening reduce the adverse obstetric outcomes related to abnormal placentation?

Alessandro Ghidini[1]* and Eduard Gratacos[2]

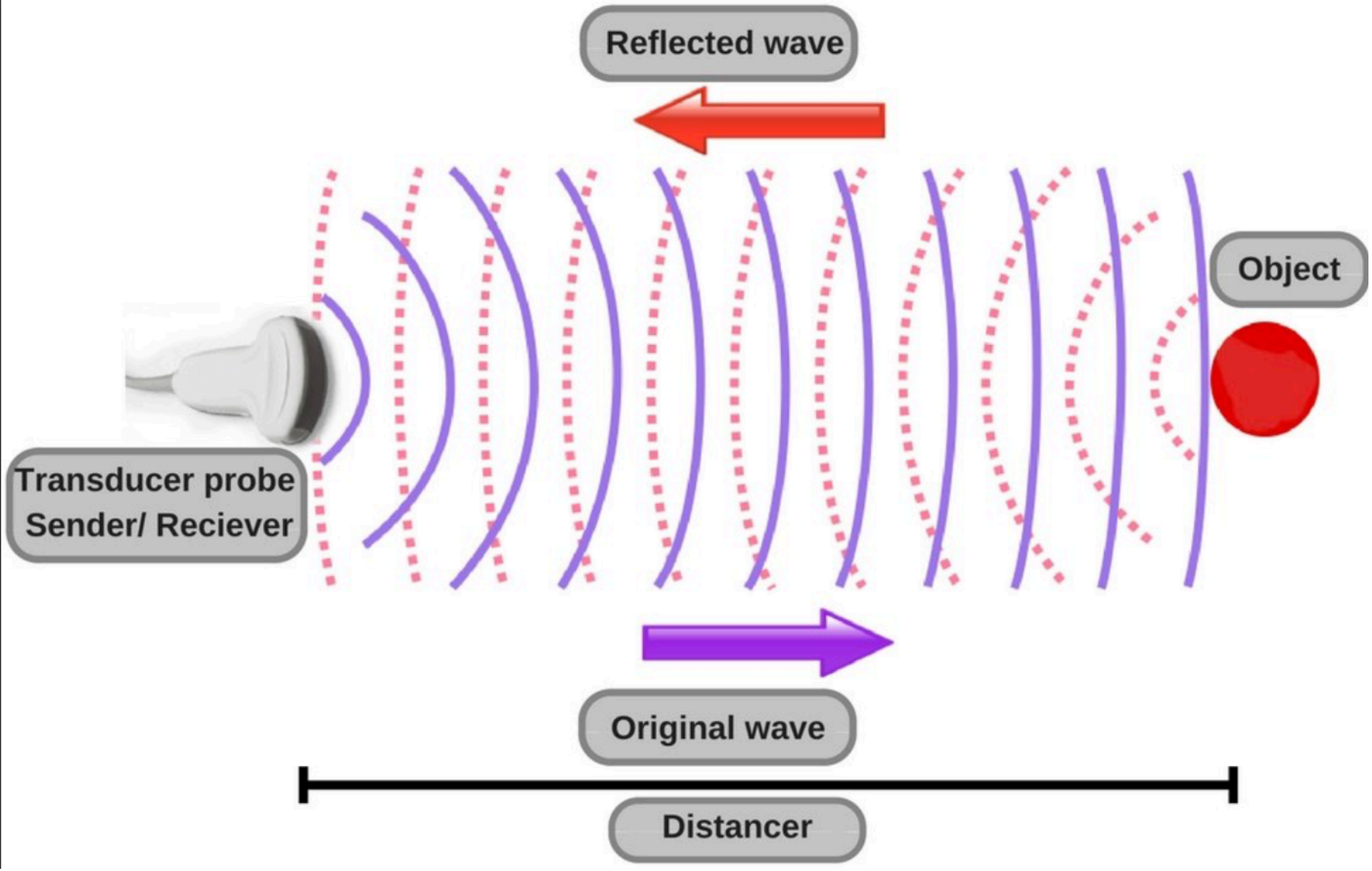
[1]Perinatal Diagnostic Center, Inova Alexandria Hospital, Alexandria, VA, USA
[2]BCNatal, Barcelona Center for Maternal-Fetal and Neonatal Medicine, Hospital Clinic and Hospital Sant Joan de Deu, IDIBAPS, CIBERER and Universitat de Barcelona, Spain
*Correspondence to: Alessandro Ghidini. E-mail: Alessandro.Ghidini@Inova.org

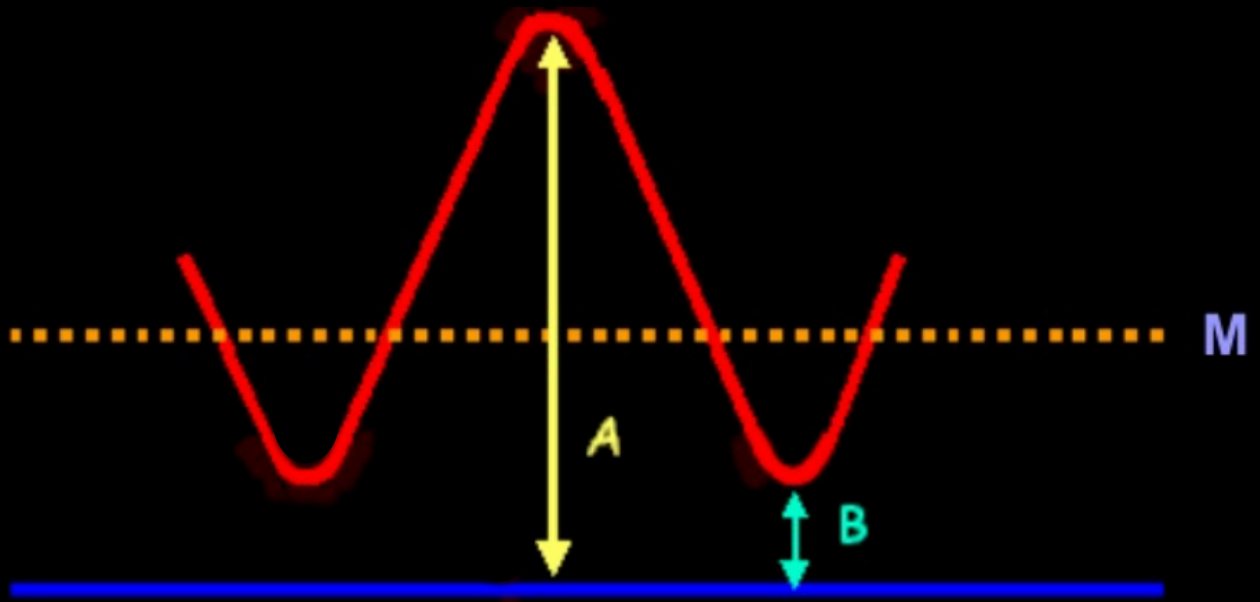


↑ **precoce**
=
↑ **recorrência**

Prenatal Diagnosis 2014.

Parâmetros
dopplervelocimétricos


Reflected wave
Object
Transducer probe
Sender/ Reciever
Original wave
Distancer



A: Sístole

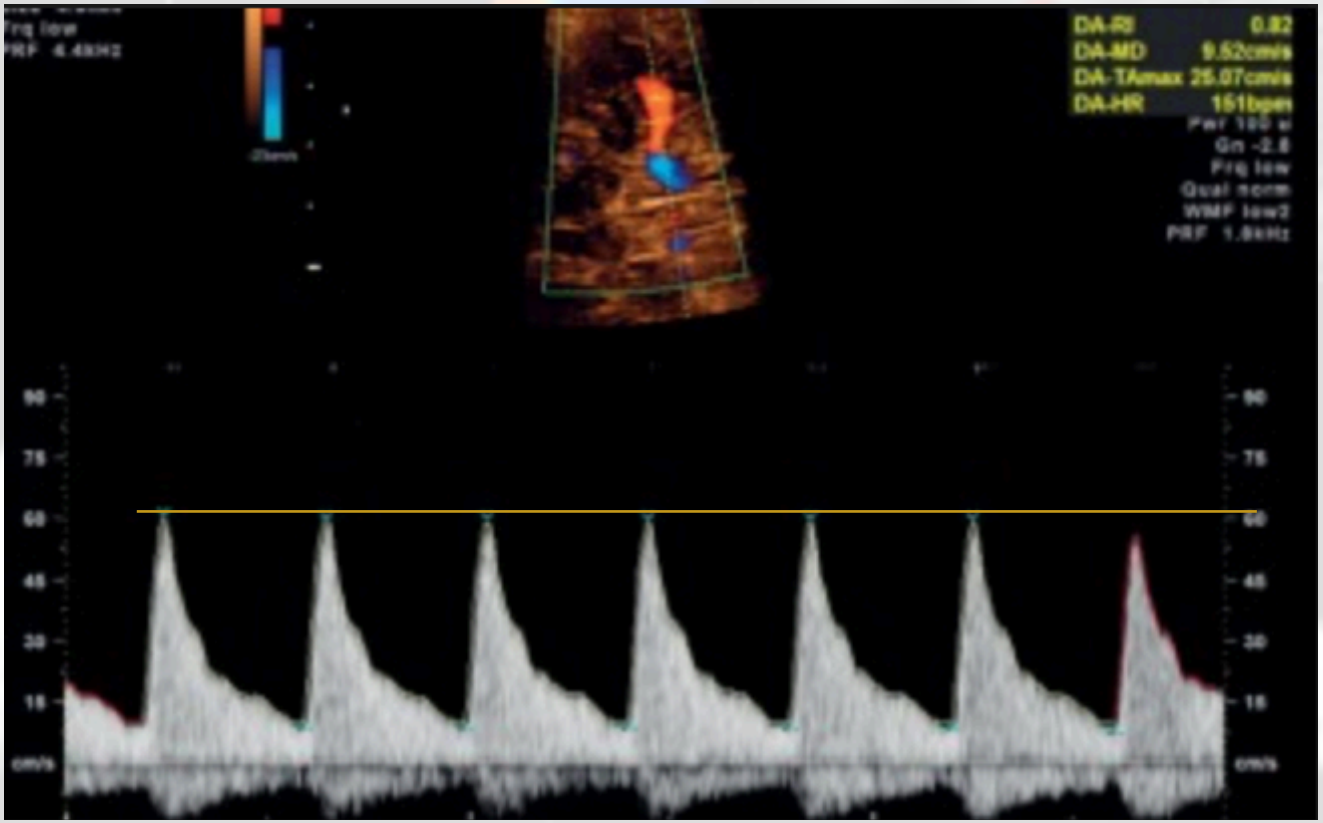
B: Diástole

M: média das velocidade em todo o ciclo cardíaco

Pico de Velocidade Sistólica (PVS)

Máximo da velocidade encontrado na sístole

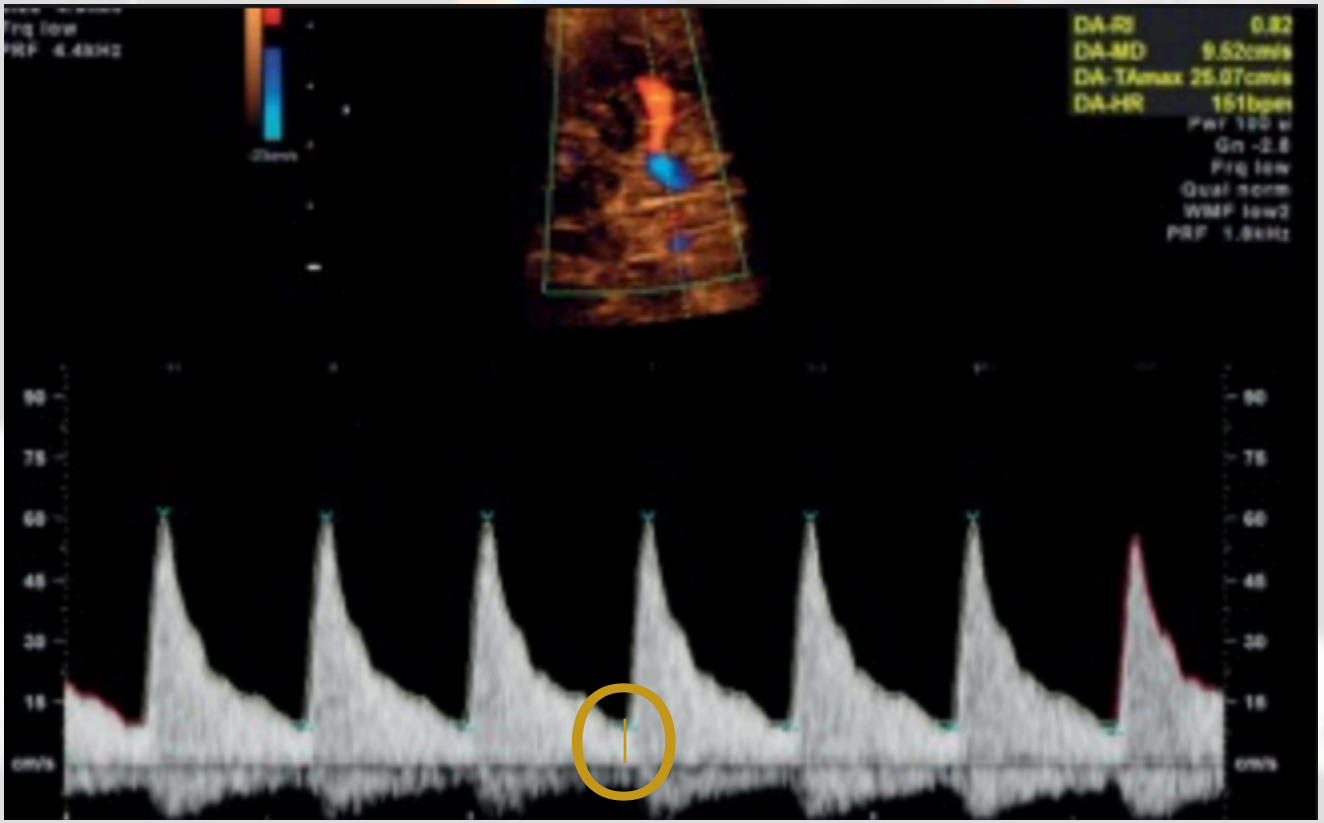
Dependente do ângulo de insonação



Velocidade Diastólica Final (VDF)

Máximo da velocidade no fim da diástole

Dependente do ângulo de insonação



Índices dopplervelocimétricos

$$IP = \frac{VS - VD}{VM}$$

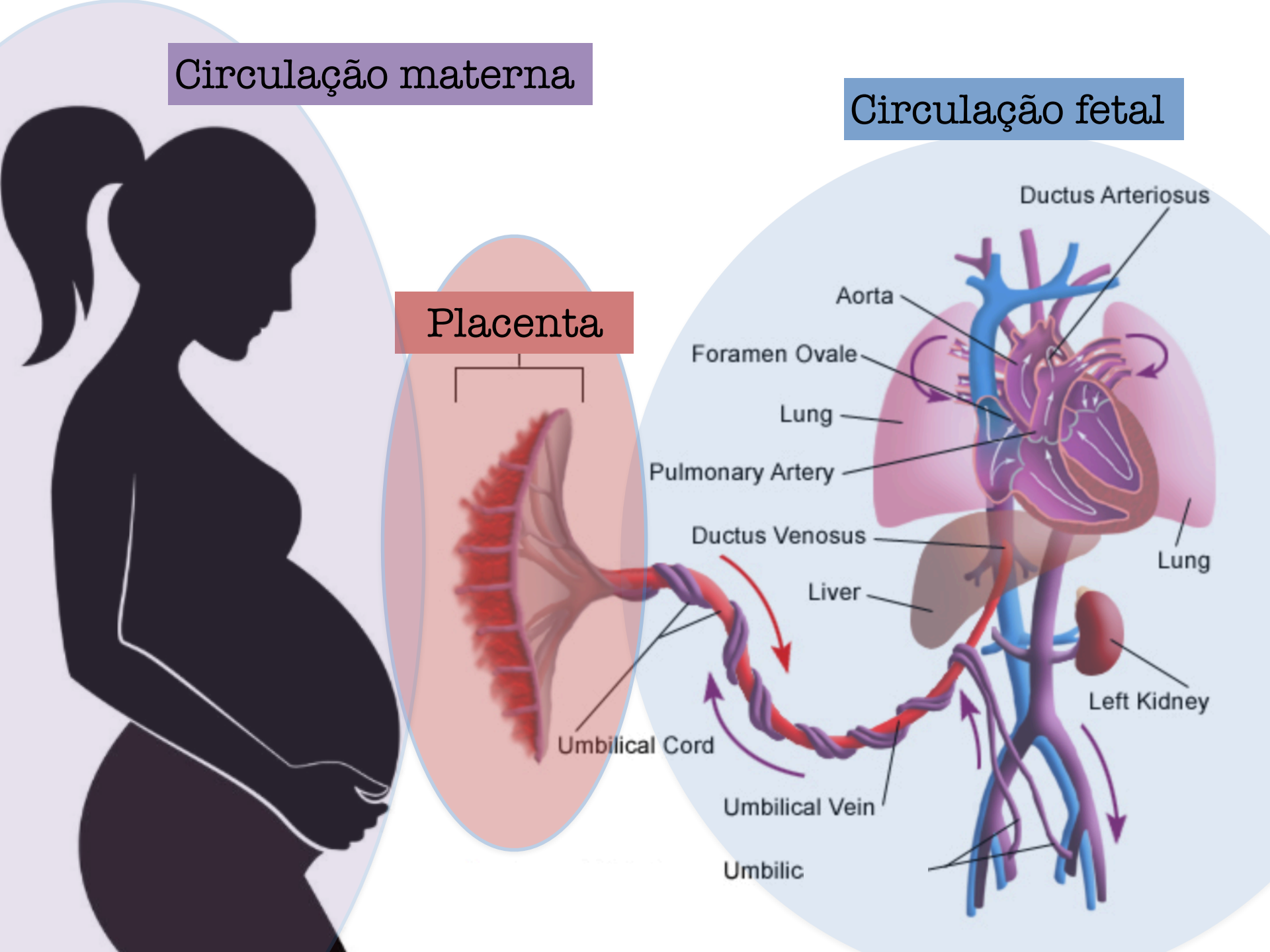
Índice de Pulsatilidade

Reflete resistência do fluxo de sangue no vaso estudado

Circulação materna

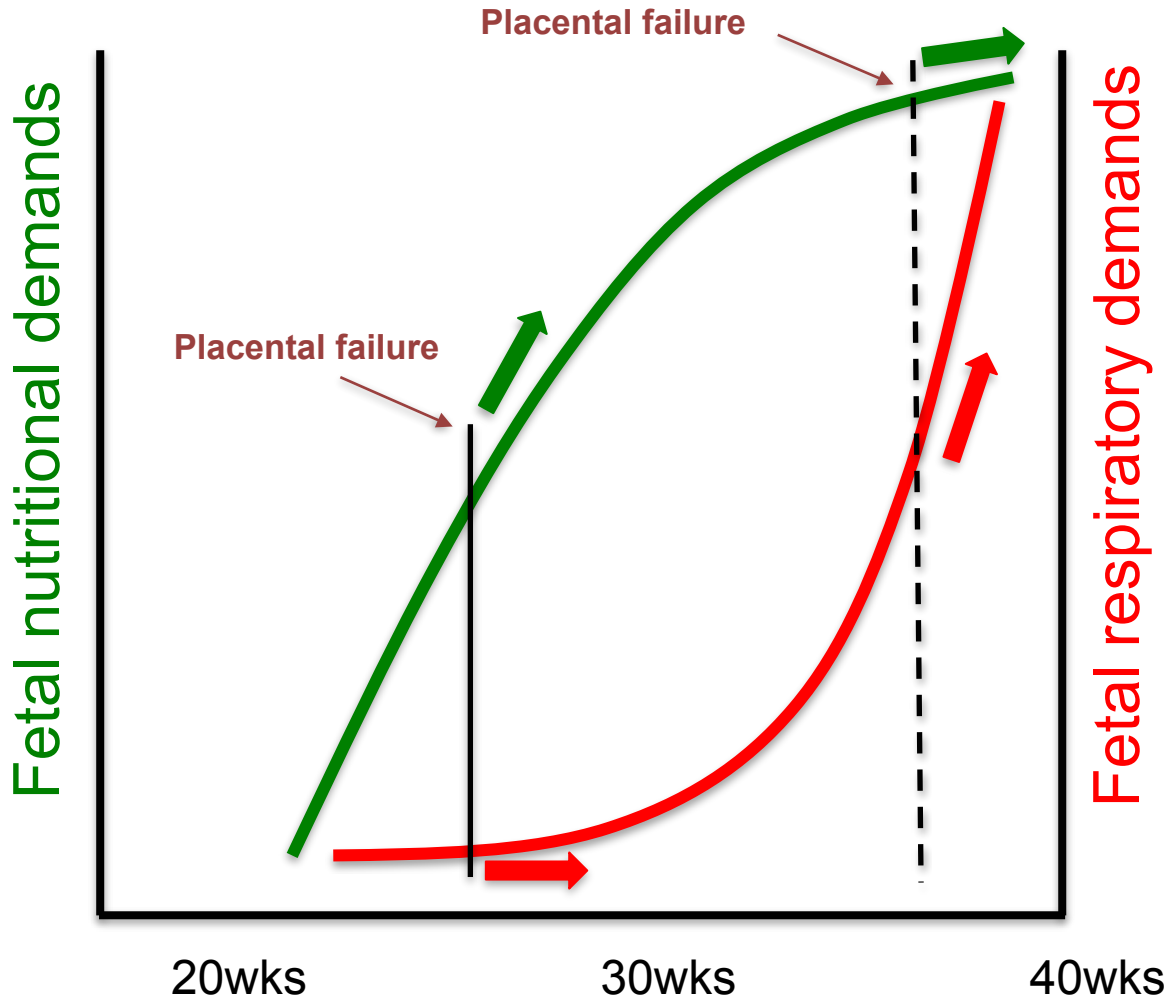
Placenta

Circulação fetal



Alterações hemodinâmicas x **Crescimento fetal**

A **nutrição** fetal e a demanda **respiratória (O^2) aumentam de maneira distinta** com a idade gestacional.

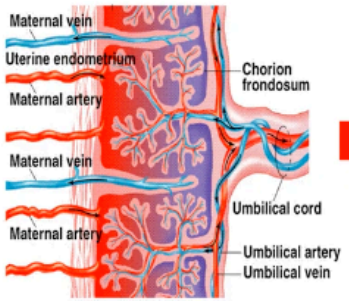


Adaptado de: Dunsworth HM *et al*. PNAS 2012

A **nutrição** fetal e a demanda **respiratória (O^2) aumentam de maneira distinta** com a idade gestacional.

SGA: symptom or disease?

St George's
University of London



PATHOLOGY
Placental dysfunction

SYMPTOM
Slow fetal growth (Food)
Death and disability (O_2)

Stillbirth and developmental handicap related to hypoxaemia not malnutrition

O bebê morre por hipóxia e
estar muito pequeno

Dias sem comida = perda p
Minutos sem oxigênio = mo

B. Thilaganathan. **Ultrasound fetal weight estimation at term may do more harm than good.** Ultrasound Obstet Gynecol 2018

Fetos Pequenos x **Fetos Restritos**
Restrição **Precoce x Tardia**

Expert Reviews ajog.org

Evidence-based national guidelines for the management of suspected fetal growth restriction: comparison, consensus, and controversy

Lesley M. McCowan, MBChB, MD; Francesc Figueras, MD, PhD; Ngaire H. Anderson, MBChB, PhD

2017

CLINICAL PRACTICE GUIDELINE

FETAL GROWTH RESTRICTION - RECOGNITION, DIAGNOSIS & MANAGEMENT

2014

The Investigation and Management of the Small-for-Gestational-Age Fetus

European Journal of Obstetrics & Gynecology and Reproductive Biology

Fetal growth restriction and intra-uterine growth restriction: guidelines for clinical practice from the French College of Gynaecologists and Obstetricians

2015

SOGC CLINICAL PRACTICE GUIDELINE

Intrauterine Growth Restriction: Screening, Diagnosis, and Management 2013

PRACTICE BULLETIN

Fetal Growth Restriction 2013-2018

SMFM CLINICAL GUIDELINE www.AJOG.org

Doppler assessment of the fetus with intrauterine growth restriction

2012

Guideline For the Management of Suspected Small for Gestational Age Singleton Pregnancies and Infants After 34 Weeks' Gestation

2014

Am J Obstet Gynecol 2018;218(2S):S855-S868.

Fetos Pequenos x **Fetos Restritos**
Restrição **Precoce x Tardia**

- Datação
- Diagnóstico
- Diferenciar
- Doppler
- Definição

Fetos Pequenos x **Fetos Restritos**
Restrição **Precoce x Tardia**

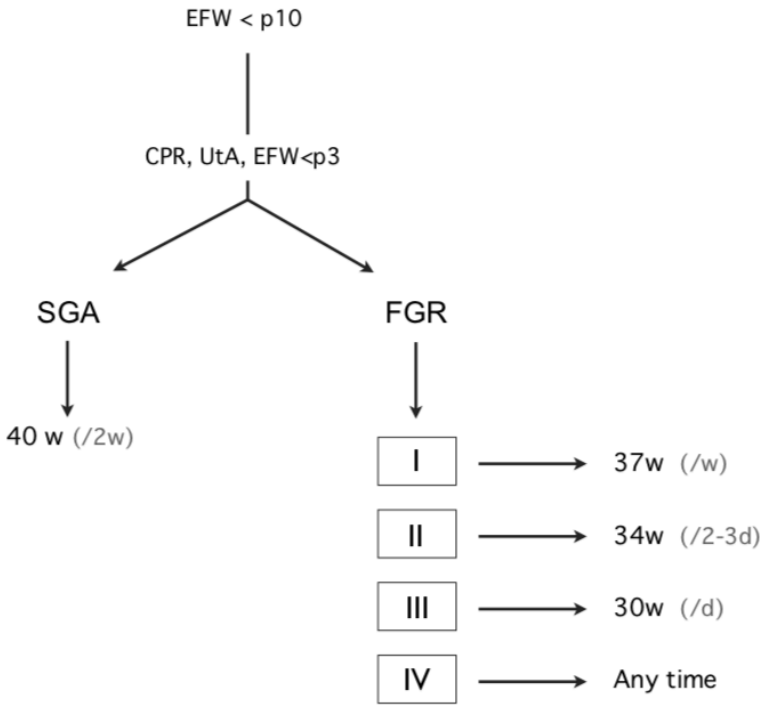
fetal iD

Integrated Management of IUGR

1. Identify small fetus

2. Distinguish SGA vs FGR

3. Timing delivery and follow up



BCN NATAL

Figueras & Gratacos 2014

www.fetalmedicinebarcelona.org/

PEQUENO PARA IDADE GESTACIONAL	
DESFECHO PERINATAL	BOM
MÉTODOS	USG + DOPPLER
PERIODICIDADE	2 SEM
PARTO	40 SEM
INDUÇÃO	OK

RESTRIÇÃO DO CRESCIMENTO FETAL

GRUPO	DEFINIÇÃO	AVALIAÇÃO •	PARTO
RESTRIÇÃO GRAVE INSUF. PLAC. LEVE	PFE < P3 ↓ ACM/AU ↑ AU ↓ ACM ↑ ART. UTERINA	SEMANAL	APÓS 37 SEM INDUÇÃO OK
INSUF. PLAC. GRAVE	AU DIÁSTOLE ZERO	CADA 2 A 3 DIAS	34 SEM CESÁREA
BAIXO RISCO DE ACIDOSE	AU DIÁSTOLE REVERSA ↑ DUCTO VENOSO	DIÁRIO	30 SEM CESÁREA
ALTO RISCO DE ACIDOSE	DV ONDA 'a' ZERO/ REVERSA CTR DESACELERAÇÃO STV <3MS	12 HORAS	26 SEM CESÁREA

Prenatal Diagnosis 2014.

	EARLY FGR	LATE FGR
Incidence	1%	10%
Clinical impact	High mortality and morbidity	Large etiological fraction of adverse outcomes (25%)
Evidence of placental disease	High 70% abnormal umbilical Doppler 60% association with preeclampsia Severe angiogenic disbalance	Low <10% abnormal umbilical Doppler 15% association with PE Mild angiogenic disbalance
Fetal hemodynamics	Systemic cardiovascular adaptation	Hemodynamic redistribution (brain sparing)
Maternal hemodynamics	Low CO High vascular resistance	High CO Normal/reduced vascular resistance
Challenge	<32 semanas	>32 semanas

Figueras F. Diagnosis and surveillance of late-onset fetal growth restriction. Am J Obstet Gynecol 2018;218(2):S774

BC NATAL FETAL MEDICINE RESEARCH CENTER

NATURAL HISTORY OF LATE IUGR

PLACENTAL DISEASE | DECOMPENSATED HYPOXIA | INJURY - DEATH

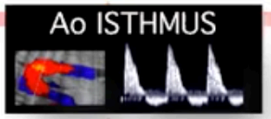
Placental resistance

CPR

placental lesion <30%

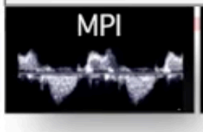
mild hypoxia

Centralization



growth

Cardiac dysfunction



minimal tolerance to hypoxia

Heart failure

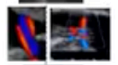
ABNORMAL CTG / BPP

Figueras & Gratacos, *Fetal Diagn Ther 2014*

BC NATAL FETAL MEDICINE RESEARCH CENTER

FGR

Management protocol according to severity stages

Stage	FGR-IV	FGR-III	FGR-II	FGR-I	SGA
Follow-up	Daily	/1-2d	/2-4d	/1-2w	/2-3w
Delivery	 DV(a-) cCTG abn  CTG dec	 DV>p95  UV puls  UA-REDV	 UA-AEDV	EFW<p3 CPR<p5 UtA>p95	 EFW=p4-9  CPR n  UtA n
Mode	CS	CS	CS or LI	LI	LI

26 30 34 37 40

Mort.	>90%	50%	<10%
Morb.		>90%	50%

CIUR TARDIO

Alta demanda por **O^2**

↓ Perfusão

↓ Latência

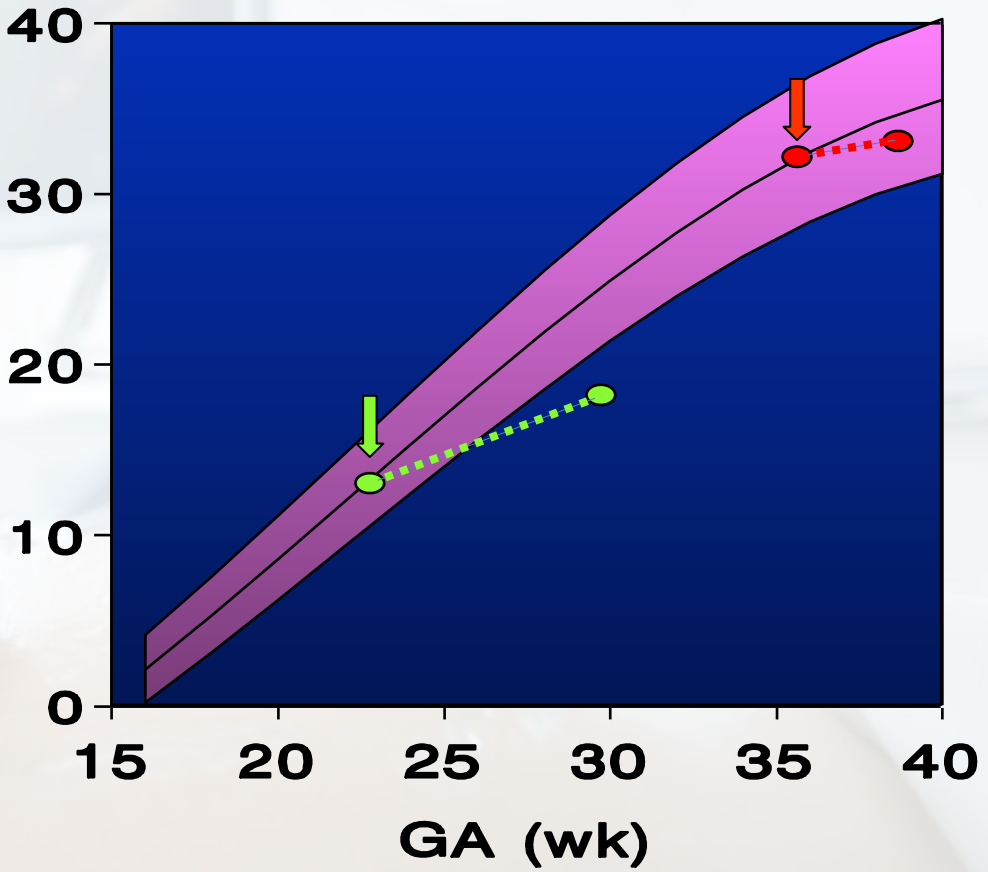
X

CIUR PRECOCE

↓ **Nutrição** = ↓ peso fetal

↑ Latência

Tempo para desenvolvimento



B. Thilaganathan. **Ultrasound fetal weight estimation at term may do more harm than good.** Ultrasound Obstet Gynecol 2018

Restrição **Precoce x Tardia**

X

MCA Doppler PI:

1.7

Percentile: 22

Ut.A Right Doppler:

1.0

Ut.A Left Doppler:

1.0

Calculate

CPR (Percentile: 7)

1.42

Mean Ut. A (Percentile:93)

1

D.V. Atrial Flow:

Present

Calculate

Fetal Growth restriction:

SGA - Normal

Recommended management:

Follow up 2 Weeks

1.5

Percentile: 12

Ut.A Right Doppler:

1.0

Ut.A Left Doppler:

1.0

Calculate

CPR (Percentile: 1)

0.75

Mean Ut. A (Percentile:94)

1

DV PI:

1.2

Percentile: >99

D.V. Atrial Flow:

Present

Calculate

Fetal Growth restriction:

Stage 3

Recommended management:

FGR Recommendation: Delivery

Como monitorizar
fetos pequenos?

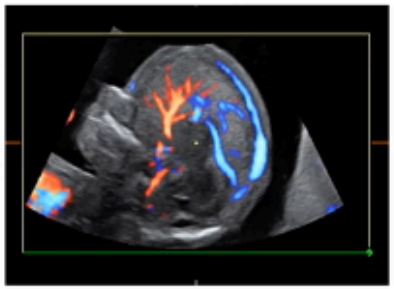
CPR and Mortality

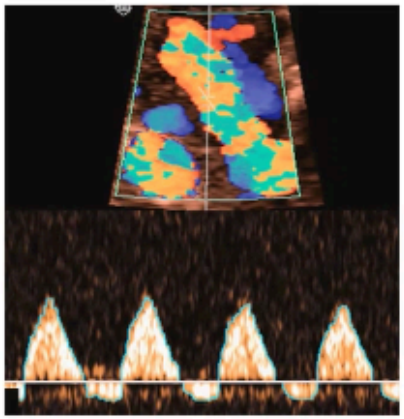
St George's University of London

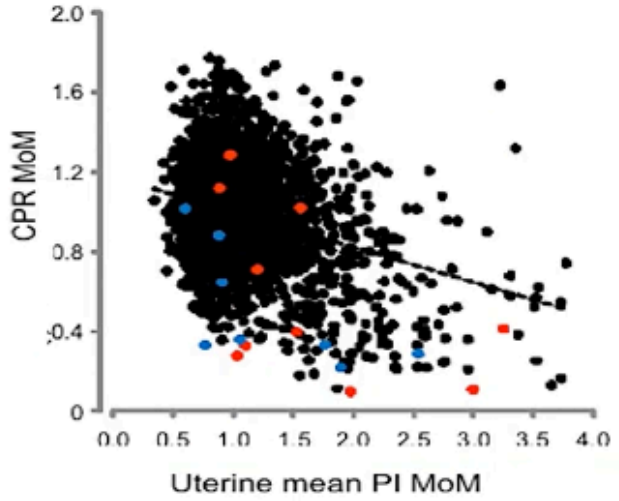
N=2832	Crude OR	p-value	Adj OR	p-value
Perinatal death (n=18)				
BW centile	0.96	<0.001	0.98	0.080
UtAD PI	3.36	<0.001	0.63	0.300
CPR MoM	0.003	<0.001	0.004	<0.001

11,576 term pregnancies

Within 4 weeks of delivery







Uterine perfusion fetal size and CPR all associated with PNM

Changes in fetal Doppler indices as a marker of failure to reach growth potential at term

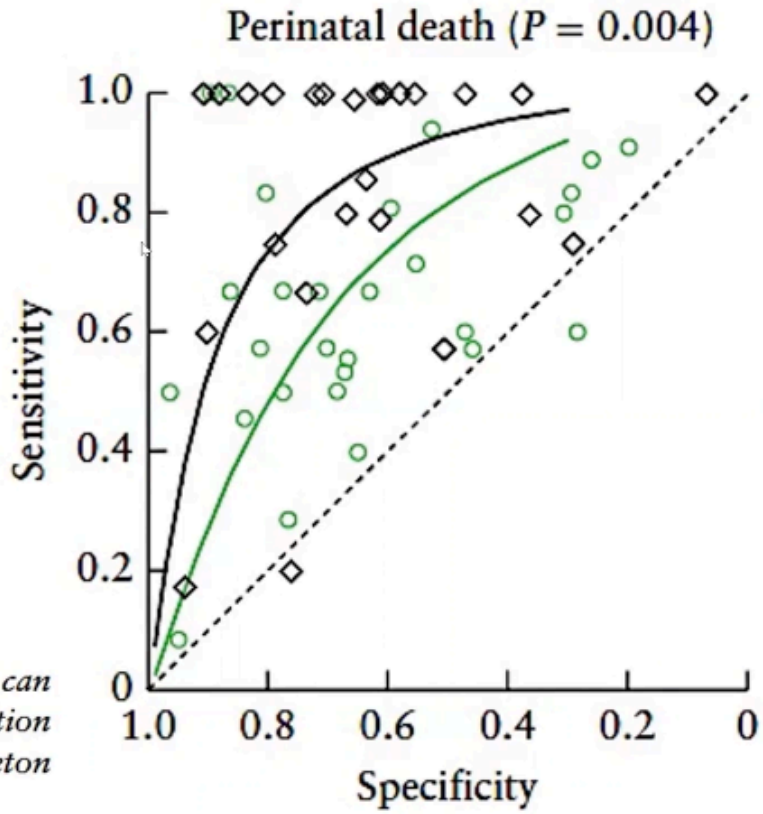
J. MORALES-ROSELLÓ*†, A. KHALIL*, M. MORLANDO*, A. PAPAGEORGHIOU*, A. BHIDE* and B. THILAGANATHAN*

St George's
University of London

Prognostic accuracy of cerebroplacental ratio and middle cerebral artery Doppler for adverse perinatal outcome: systematic review and meta-analysis

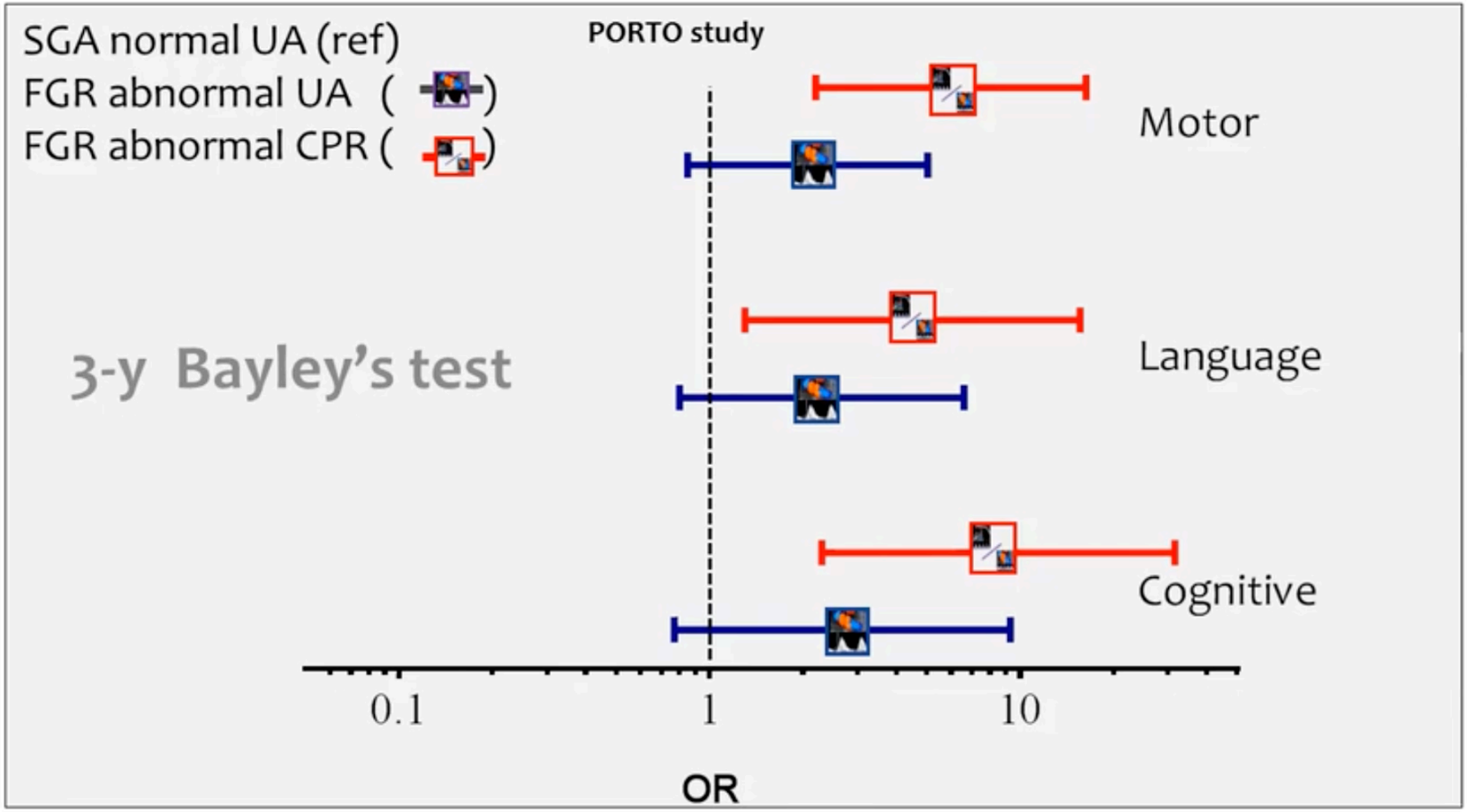
C. A. VOLLGRAFF HEIDWEILLER-SCHREURS[1], M. A. DE BOER[1], M. W. HEYMANS[2], L. J. SCHOONMADE[3], P. M. M. BOSSUYT[4], B. W. J. MOL[5,6], C. J. M. DE GROOT[1] and C. J. BAX[7]

128 studies
47,748 pregnancies



Conclusion Calculating the CPR with MCA Doppler can add value to UA Doppler assessment in the prediction of adverse perinatal outcome in women with a singleton pregnancy.

An abnormal cerebroplacental ratio (CPR) is predictive of early childhood delayed neurodevelopment in the setting of fetal growth restriction. Monteith C, Am J Obstet Gynecol 2019 (June)



Outras formas de monitorizar fetos pequenos?

THE COCHRANE COLLABORATION®

Antenatal cardiotocography for fetal assessment (Review)

Grivell RM, Alfirevic Z, Gyte GML, Devane D

↓ sensibilidade para detectar hipóxia.

"Não existe evidência de que a CTB antenatal melhora o desfecho perinatal".

"Perfil biofísico fetal NÃO prediz desfecho perinatal adverso".

Grivell RM, et. al., Cochrane Database Syst Rev. 2010

BILARDO, C M, et al. Severe fetal growth restriction at 26–32weeks: key messages from the TRUFFLE study. Ultrasound Obstet Gynecol 2017

The TRUFFLE study; fetal monitoring indications for delivery in 310 IUGR infants with 2 year's outcome delivered before 32 weeks of gestation

Gerard H.A.Visser (1), C.M Bilardo (2), J.B.Derks (1), E Ferrazzi (3), N.Fratelli (4), T. Frusca (5), W. Ganzevoort (6), C.Lees (7), R. Napolitano (8), T.Todros (9), H.Wolf (6), K.Hecher (10) on behalf of the TRUFFLE group investigators*

"Safety net"

Rede de segurança

CIUR PRECOCE

↓

CTB computadorizada **+** **IP Ducto venoso**

↓

Parto

Grivell RM, et. al., Cochrane Database Syst Rev. 2010

BILARDO, C M, et al. Severe fetal growth restriction at 26–32weeks: key messages from the TRUFFLE study. Ultrasound Obstet Gynecol 2017

Crescimento fetal ...

Ultrasound Obstet Gynecol 2020; **55**: 170–176
Published online 8 January 2020 in Wiley Online Library (wileyonlinelibrary.com). **DOI:** 10.1002/uog.21909.

Impact of biometric measurement error on identification of small- and large-for-gestational-age fetuses

D. WRIGHT[1], A. WRIGHT[1], E. SMITH[2] and K. H. NICOLAIDES[3]

[1]*Institute of Health Research, University of Exeter, Exeter, UK;* [2]*Ultrasound Clinic Bovenmaas, Rotterdam, The Netherlands;* [3]*Harris Birthright Research Centre for Fetal Medicine, King's College Hospital, London, UK*

85% PEG nascem a termo.

↓ relevância da curva de crescimento.

Crescimento fetal ...

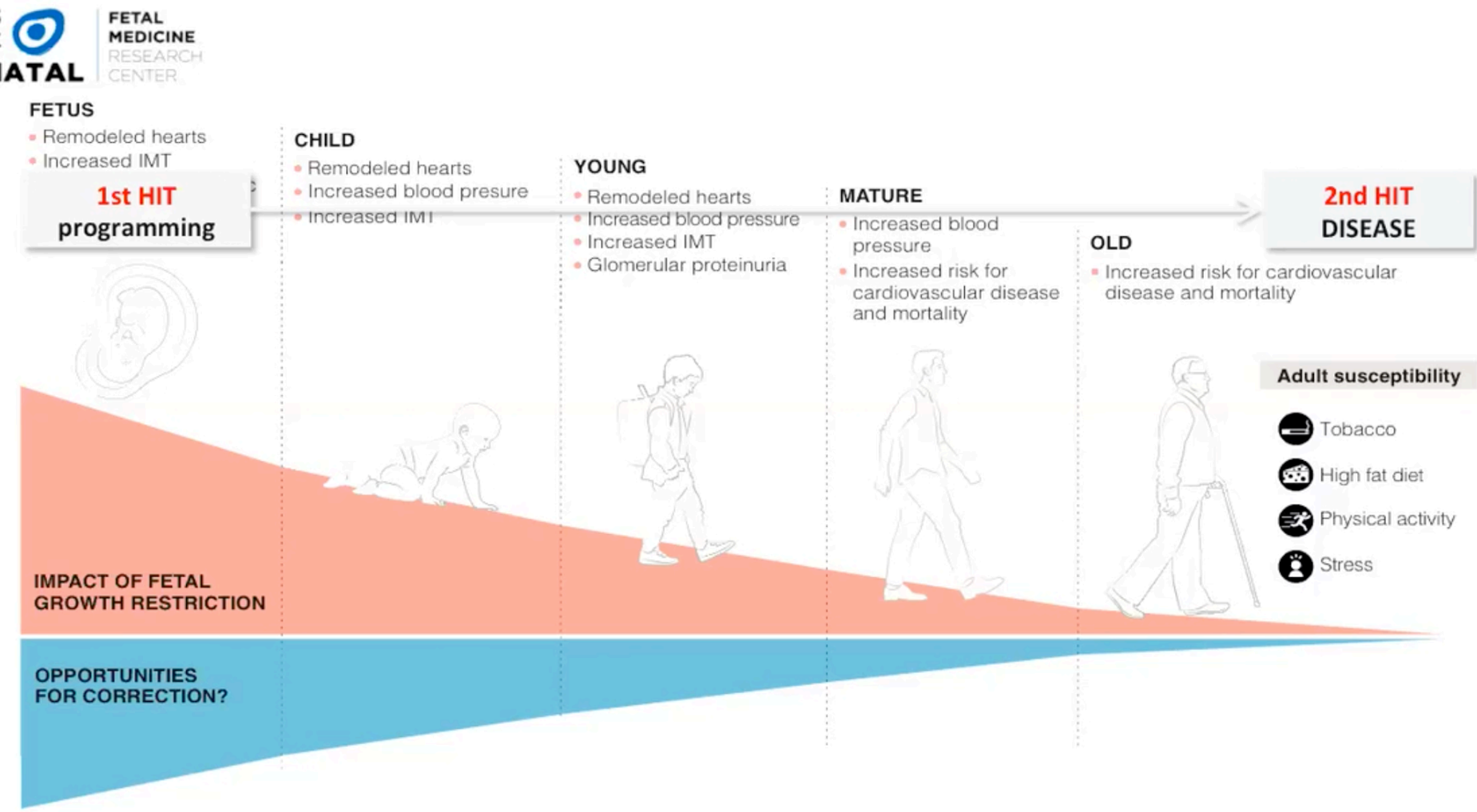
A ↓ de 2 Quartis ou 50 percentis deve **ALERTAR** para possibilidade de CIUR.

*** * evidências não são claras**

Redistribuição arterial fetal possui maior relação com **óbito fetal a termo** em comparação ao PFE.

Lees CC, et al. **ISUOG Practice Guidelines: diagnosis and management of small-for-gestational-age fetus and fetal growth restriction.** Ultrasound Obstet Gynecol 2020.

B. Thilaganathan. **Ultrasound fetal weight estimation at term may do more harm than good.** Ultrasound Obstet Gynecol 2018



F Crispi, J Miranda & E Gratacos AJOG 2018

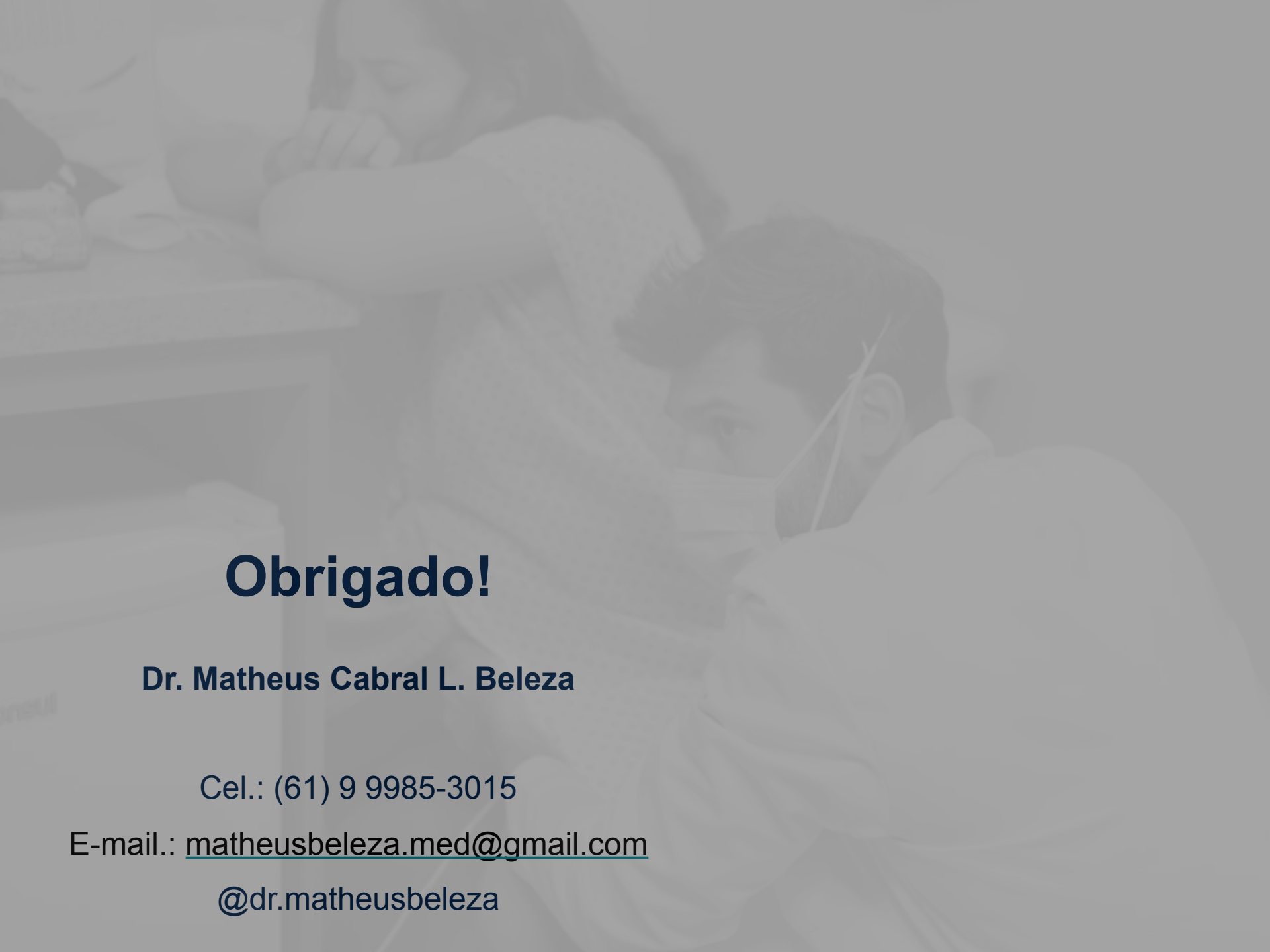
Casos clínicos:

Caso 1
RCIU Tardio

37+5 - percentil 2
Sofrimento fetal intra-parto
Cesárea de urgência

Caso 2
RCIU Precoce

Cesárea marcada com 32s
PFE: 1400g (percentil 2)
Doppler alterado → DV



Obrigado!

Dr. Matheus Cabral L. Beleza

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