VIETNAM 2010

PATHOPHYSIOLOGY OF DIABETES IN PREGNANCY

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Gestational diabetes

- Defined as any degree of glucose intolerance of varying severity with onset or first recognition during pregnancy
- With obesity, it is the most common metabolic abnormality during pregnancy
- 7% of all pregnancies, range of prevalence 1-14%

SHOULD WE EXPECT AN INCREASE IN DIABETIC PREGNANTS?

INCREASE OF BMI & OBESITY

INCREASE IN CHILDREN OBESITY

INCREASED MEAN AGE AT 1° PREGNANCY

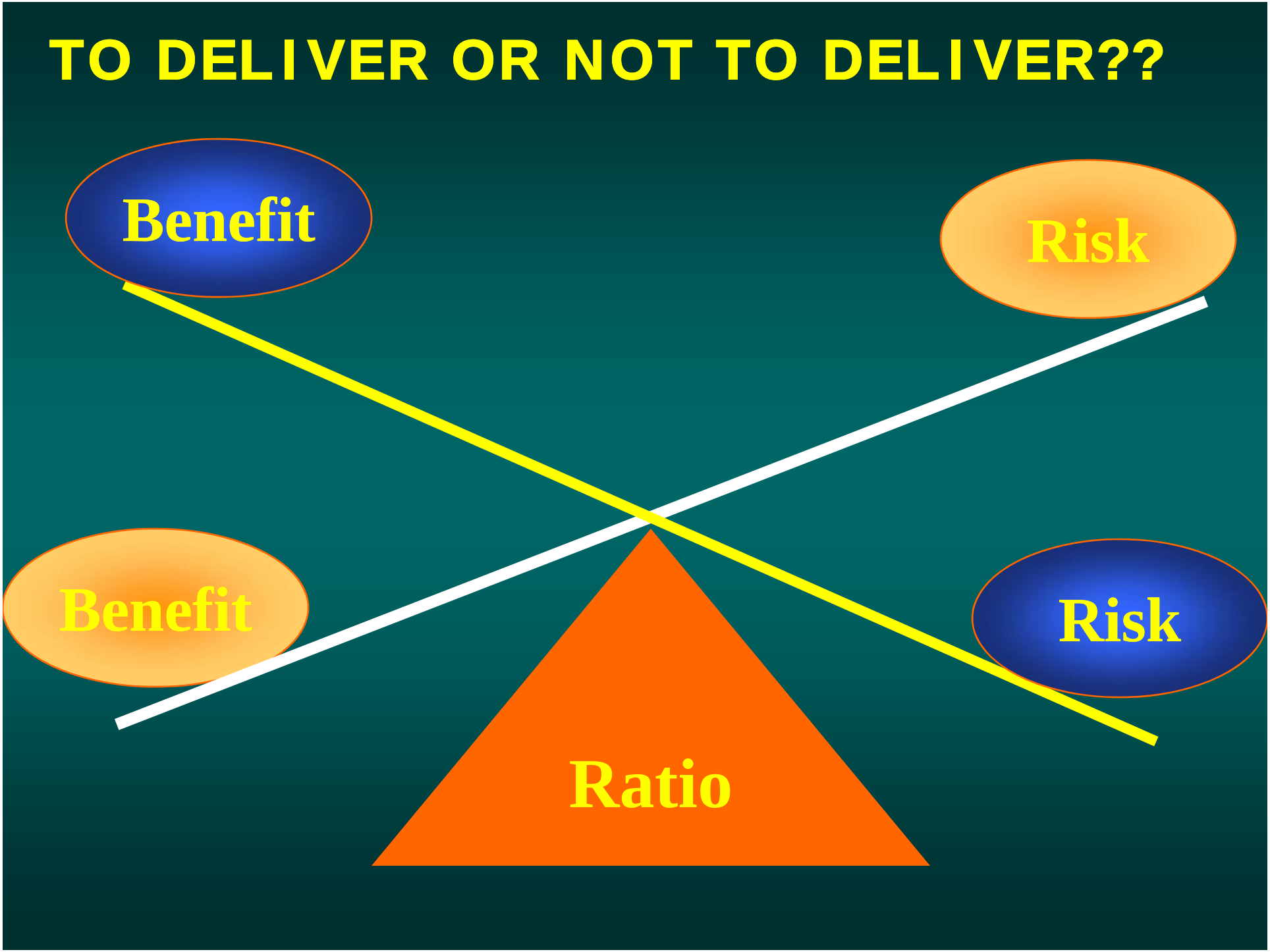
YES

ELECTIVE DELIVERY IN DIABETIC PREGNANCY ?

TIMING OF DELIVERY OF THE DIABETIC PATIENT IS A BALANCING ACT BETWEEN:

- **POTENTIAL INTRAUTERINE DEATH**
- **SHOULDER DYSTOCIA**
- **CESAREAN SECTION and**
- **THE CONSEQUENCES OF PREMATURE DELIVERY.**

TO DELIVER OR NOT TO DELIVER??



Cesarean Section – Adverse Outcome

Immediate

Risk of anesthesia

Blood loss

Bowel and bladder injury

Amniotic or air embolism

Scalp damage to baby 1-2%

Post-op Risks

Infection

Bleeding

Neonatal RDS/wet lungs

Relative Risk for Rehospitalization C/S vs VD

Washington state 54,074 CS, 142,765 SVD

Lndon-Rochelle et al JAMA 2000

	Incidence / 1000 high risk women		
	SVD	**CS**	**RR**
Uterine infection	**2.9**	**5.2**	**2.0**
Wound infection	**0.1**	**3.9**	**30.2**
PPH	**2.4**	**2.9**	**1.2**
Genitourinary	**1.3**	**1.7**	**1.5**
Thromboembolism	**0.3**	**0.9**	**2.5**
Total	**10.0**	**17.0**	**1.8**

Stillbirth

Association Between Diabetes & SB's US, '95-'97

Mondestin, Am J Ob Gyn 2002;187:922-6

	Fetal death rate			
	Non-diabetic	*Diabetic*		
Birth weight (g)	N=10,733,983	N=271,691	*RR*	*(95% CI)*
2,250-2,499	7.2	13.6	1.8	(1.4-2.2)
2,500-2,749	3.3	8.3	2.3	(1.8-2.8)
2,750-2,999	1.8	3.4	1.6	(1.3-2.6)
3,000-3,249	1.1	2.6	1.7	(1.4-2.2)
3,250-3,499	0.7	2.4	2.9	(2.4-3.5)
3,500-3,749	0.6	2.4	3.2	(2.6-3.6)
3,750-3999	0.6	2.3	3.2	(2.5-4.1)

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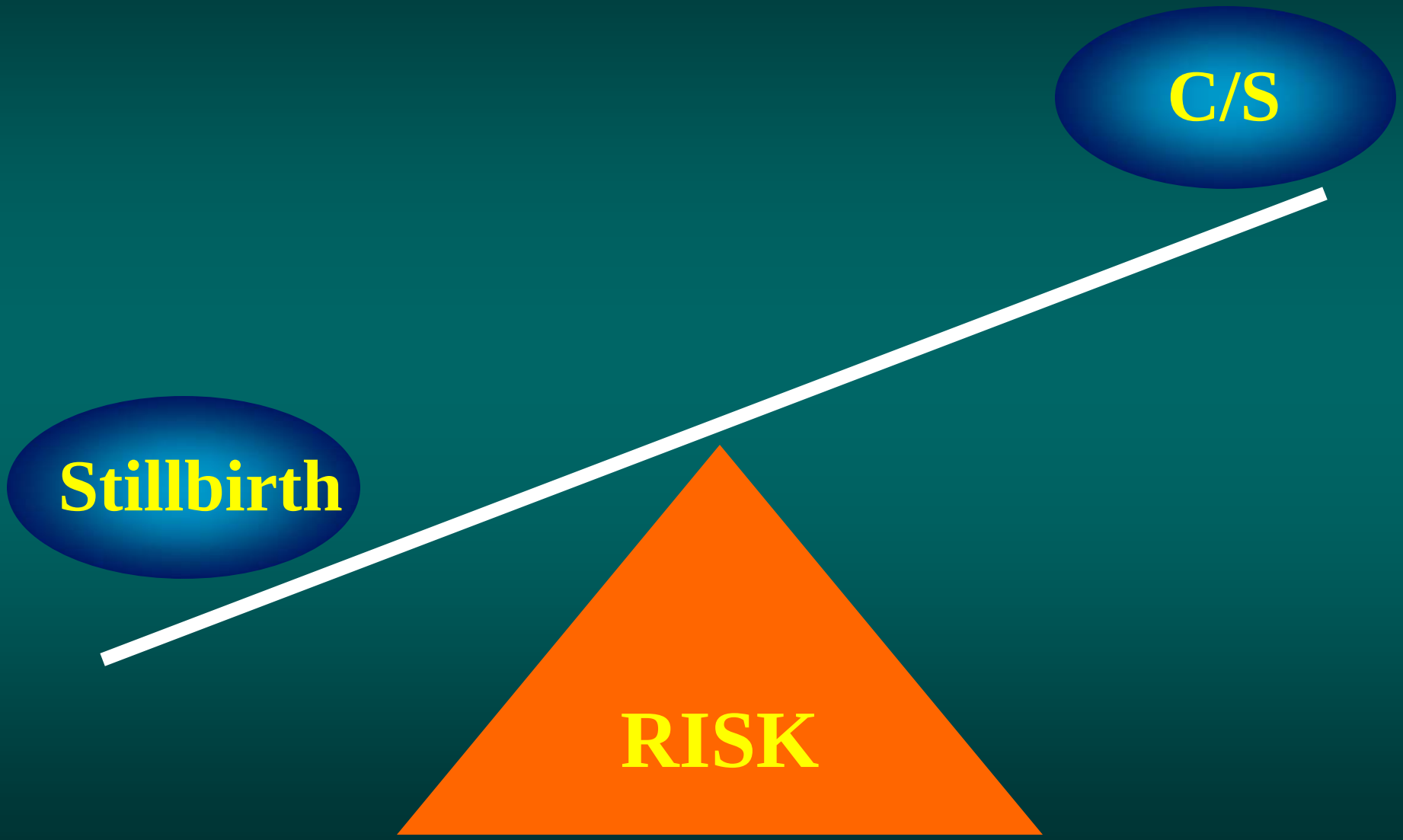
4,750-4,999	2.0	8.6	3.1	(1.9-5.1)
5,000-5,249	3.7	15.9	3.4	(1.9-6.1)
5,250-5,499	5.2	21.6	3.6	(1.5-8.6)
>5,500	18.3	38.9	1.8	(1.7-1.9)

TO DELIVER OR NOT TO DELIVER?

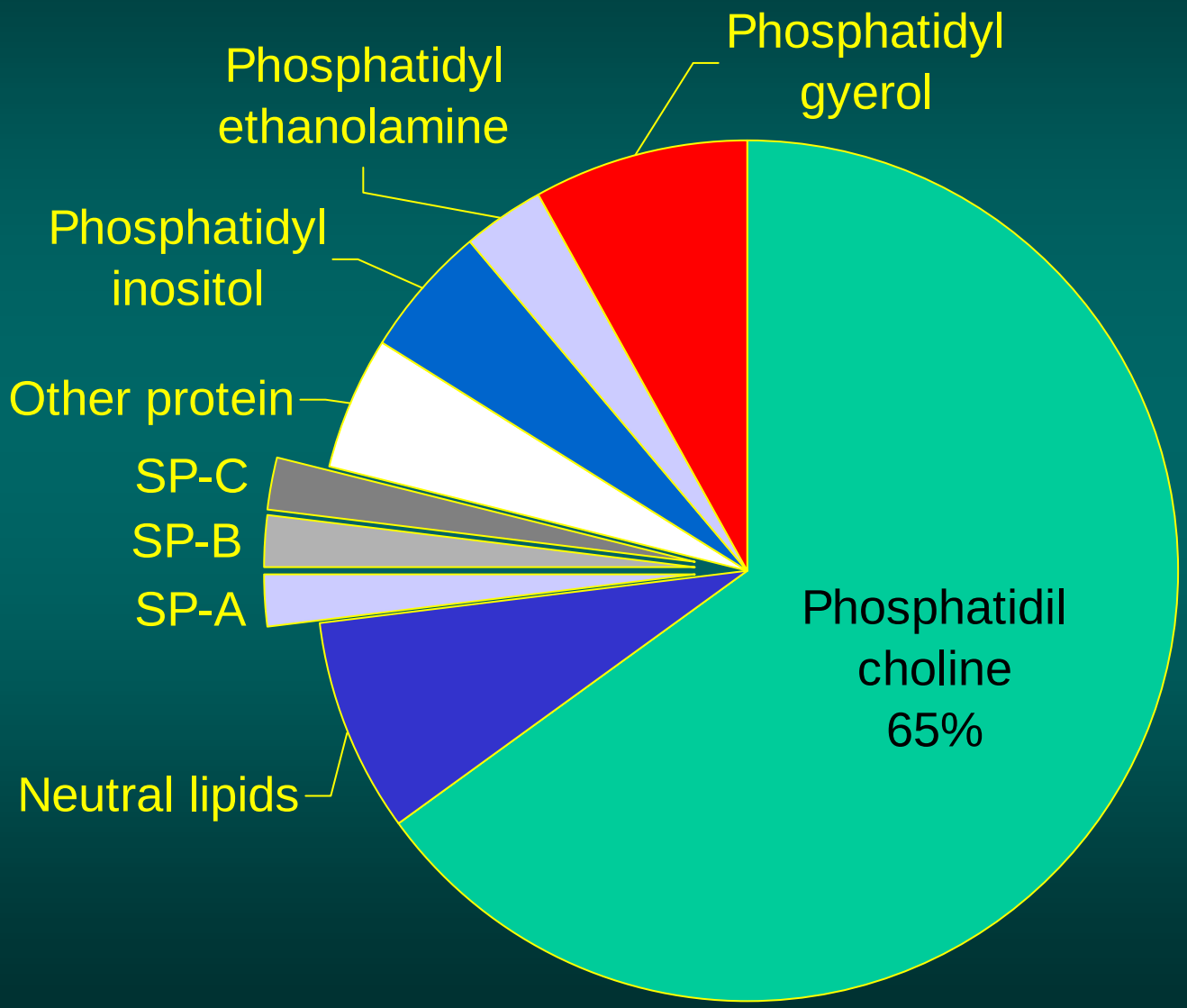


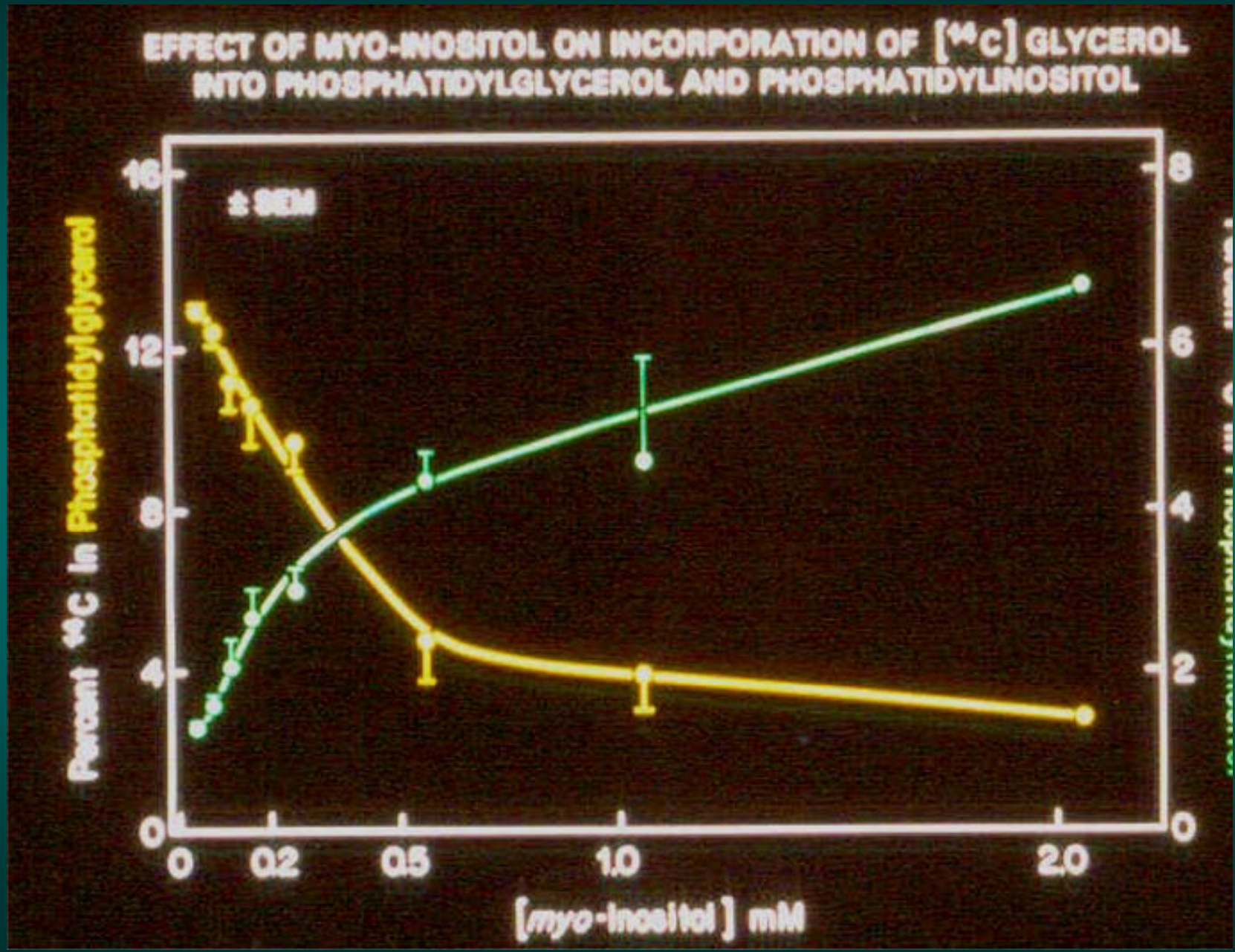
Lung Maturation

Diabetic pregnancy and fetal lung maturity

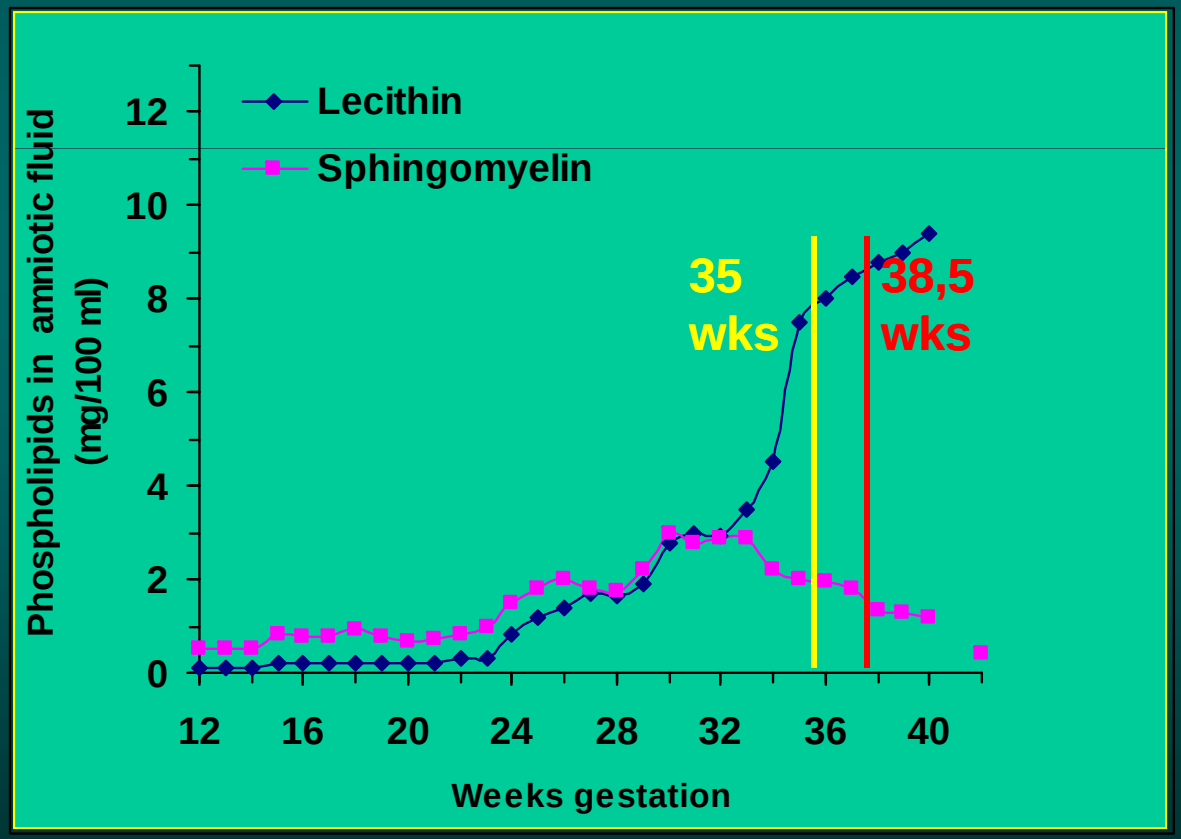
- Nondiabetic fetus achieves pulmonary maturity at a mean gestational age of 34-35 weeks
- By 37 weeks, more than 99% of normal newborns have mature lung profiles as assessed by phospholipid assays
- In a diabetic pregnancy, however, it is unwise to assume that the risk of respiratory distress has passed until after 38,5 gestational week have been completed

Composition of surfactant




EFFECT OF MYO-INOSITOL ON INCORPORATION OF [14C] GLYCEROL INTO PHOSPHATIDYLGLYCEROL AND PHOSPHATIDYLINOSITOL
± SEM
Percent 14C in Phosphatidylglycerol
16
12
8
4
0
8
6
4
2
0
0
0.2
0.5
1.0
2.0
[myo-Inositol] mM

Changes in the concentrations of lecithin and sphingomyelin in the amniotic fluid. The achieved pulmonary maturity in nondiabetic and diabetic pregnancy



LUNG IMMATURITY: POOR vs. WELL CONTROL

Piper, AJOG 1993
Langer, JMFM 2002

	R.R.	95% C.I.
< 34 WEEKS	1.27	0.02 – 107
34–36.9 WEEKS	1.25	0.43 – 3.70
37–37.9 WEEKS	4.33	1.02 – 19.3
38–38.9 WEEKS	2.50	0.61 – 10.9
> 39.0 WEEKS	1.00	0.33 –

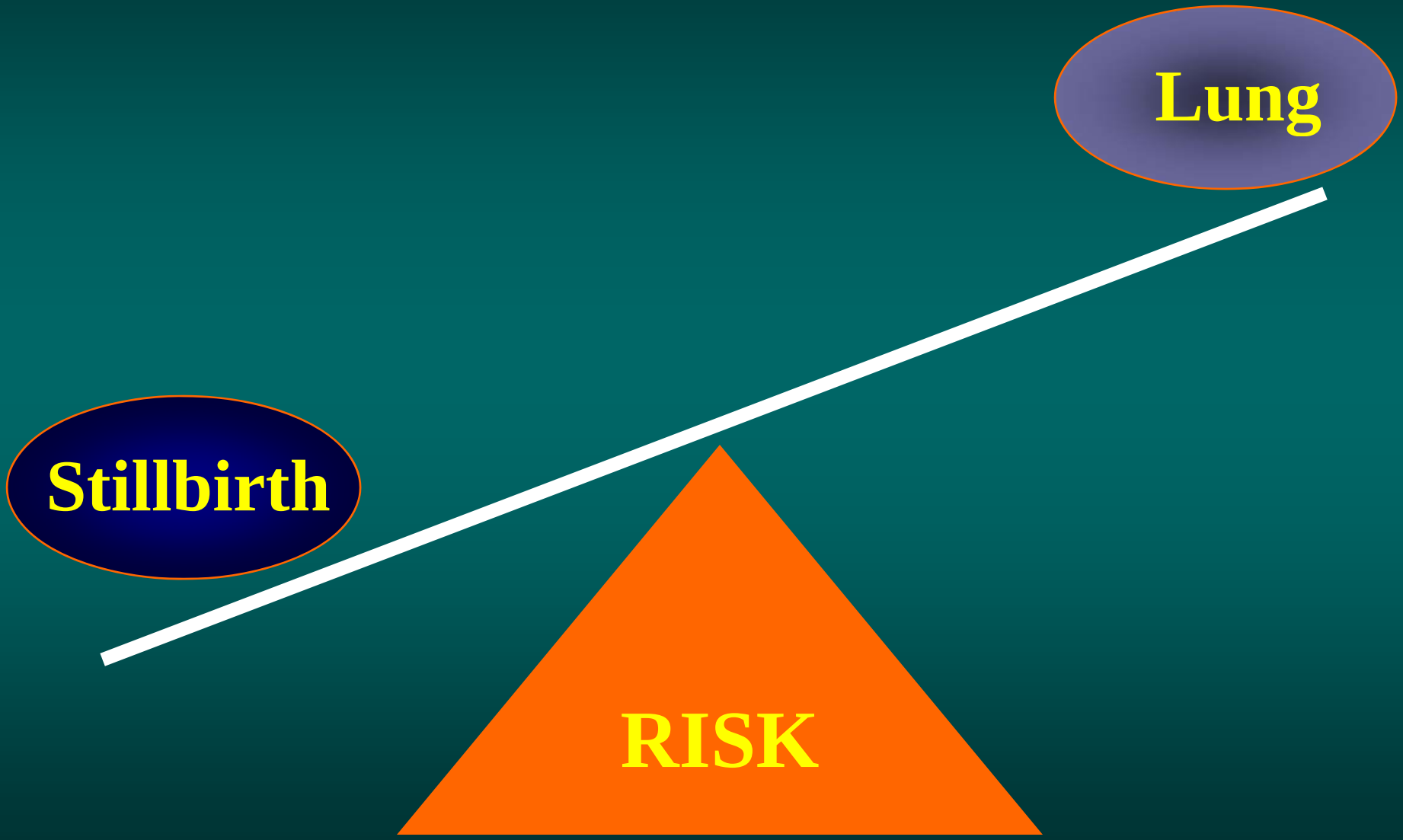
LUNG IMMATURITY: POOR CONTROL vs. NON-DIABETIC

	R.R.	95% C.I.
< 34 WEEKS	7.37	1.0 – 36.9
34-36.9 WEEKS	3.64	1.9 – 6.9
37-37.9 WEEKS	4.12	1.7 – 10.4
38-38.9 WEEKS	4.26	1.2 – 13.6
>38.9 WEEKS	4.04	1.2

LUNG IMMATURITY: WELL CONTROL vs. NON-DIABETIC

	R.R.	95% C.I.
< 34 WEEKS	4.69	0.61 – 31.1
34-36.9 WEEKS	2.33	0.94 – 5.76
37-37.9 WEEKS	3.81	0.94 – 16.6
38-38.9 WEEKS	1.43	0.23 – 9.10
> 39.0 WEEKS	0.45	0.10 –

TO DELIVER OR NOT TO DELIVER?



Macrosomia

What is in the box ?

ACOG PRACTICE BULLETIN

1. Unfortunately, the prenatal diagnosis of fetal macrosomia remains imprecise.

ACOG, 2000

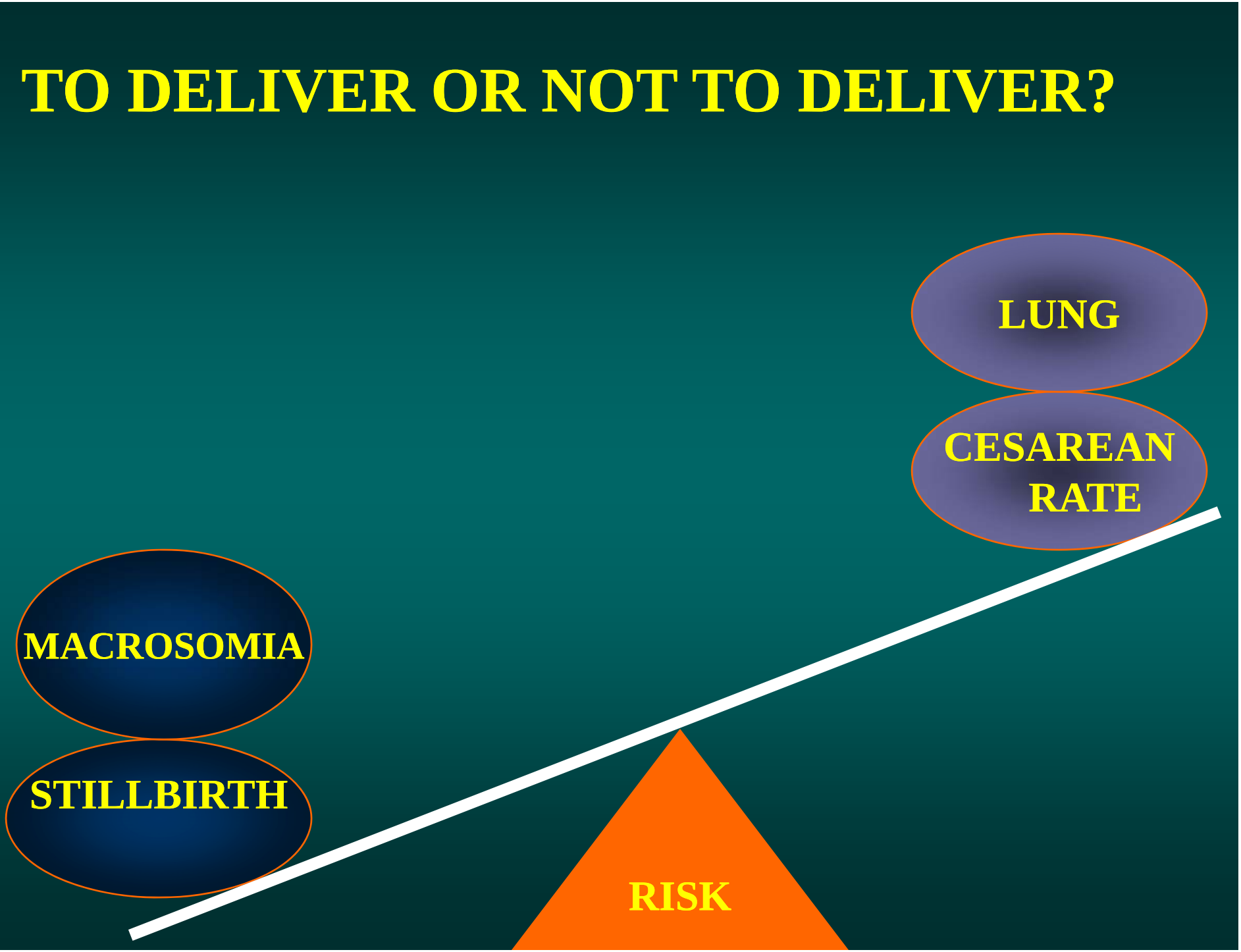
What is in the box ?

ACOG PRACTICE BULLETIN

2. Although ultrasonography enables the direct measurement of various fetal body parts, its accuracy in predicting macrosomia has been unreliable.

ACOG, 2000

TO DELIVER OR NOT TO DELIVER?



Shoulder Dystocia

Prognosis for Brachial Plexus Injury

Of all cases of shoulder dystocia:

15% suffer brachial plexus injury
20% of these are permanent

Therefore,

3% shoulder dystocia have permanent injury

In the USA - 54,000 infants >4500 g

19% SD in >4500 g= 10,260 infants

2/3 BPI = 6840 infants

80% full recovery = 5472 infants

20% permanent BPI = 1368 infants

The price:

Estimates of unnecessary CSs to prevent shoulder dystocia:

50:1 – 1000:1

When there is uncertainty…

2. Elective CS

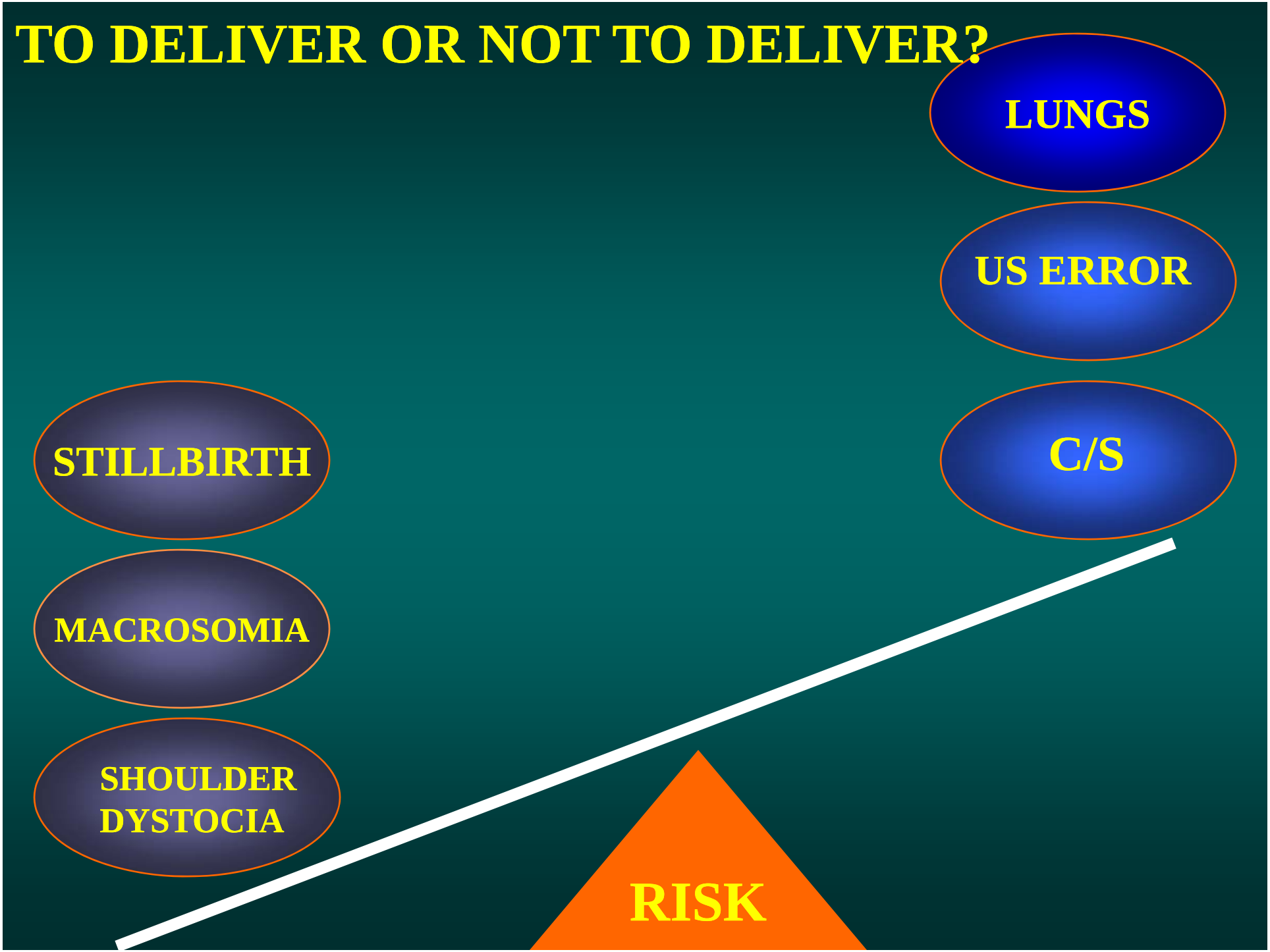
- Even more unnecessary CSs would be needed to prevent a single case of BPI

The price:

Estimates of unnecessary CSs to prevent brachial plexus injury:

100:1 – 3000:1

TO DELIVER OR NOT TO DELIVER?



OPTIMAL MANAGEMENT

What is critical in taking care of pregnants affected by diabetes?

GDM

...a new disease in a particular lifetime

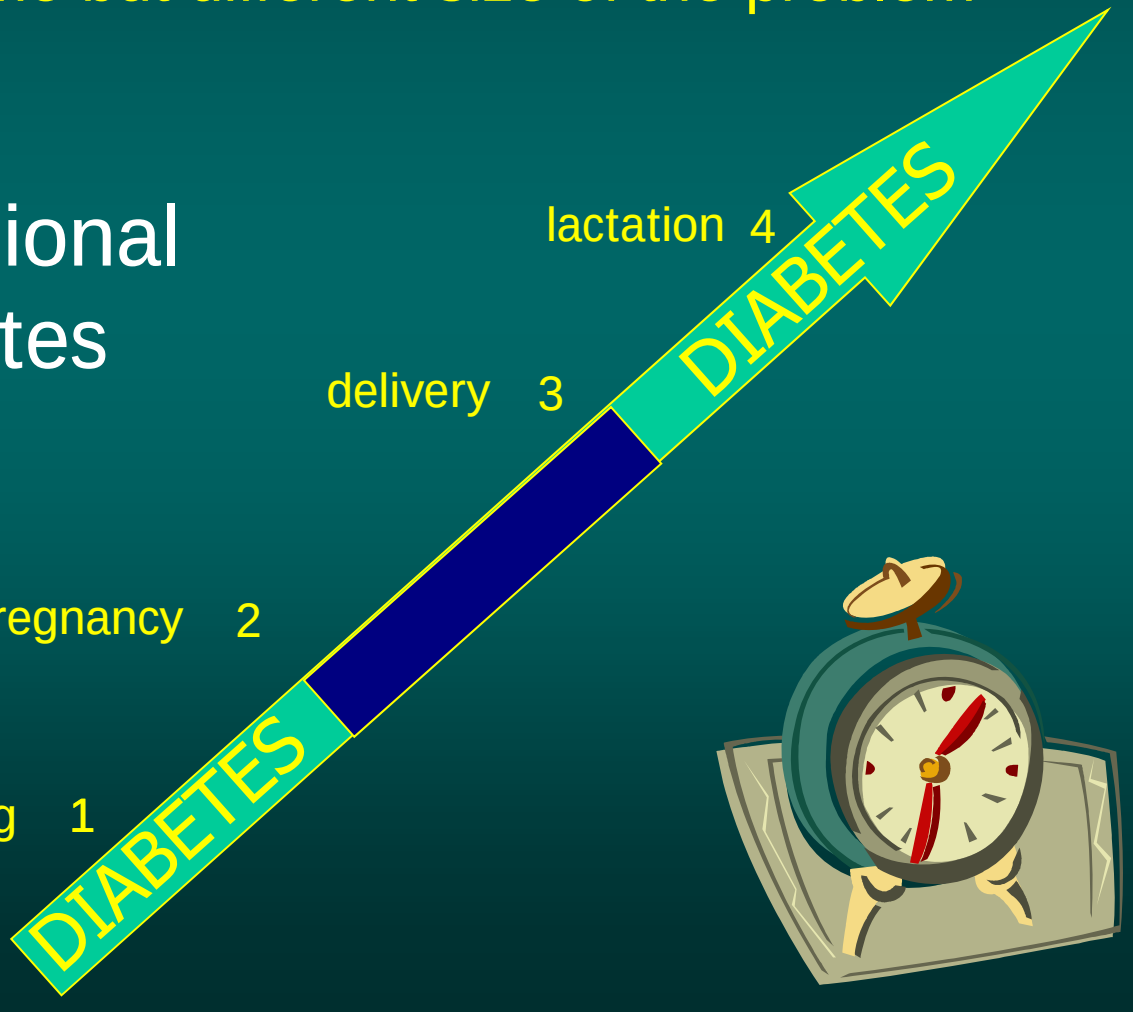
Pregestational diabetes

...to consider the impact of diabetes on foetus

What is critical in taking care of pregnants affected by diabetes?

…..similar name but different size of the problem

Pregestational diabetes



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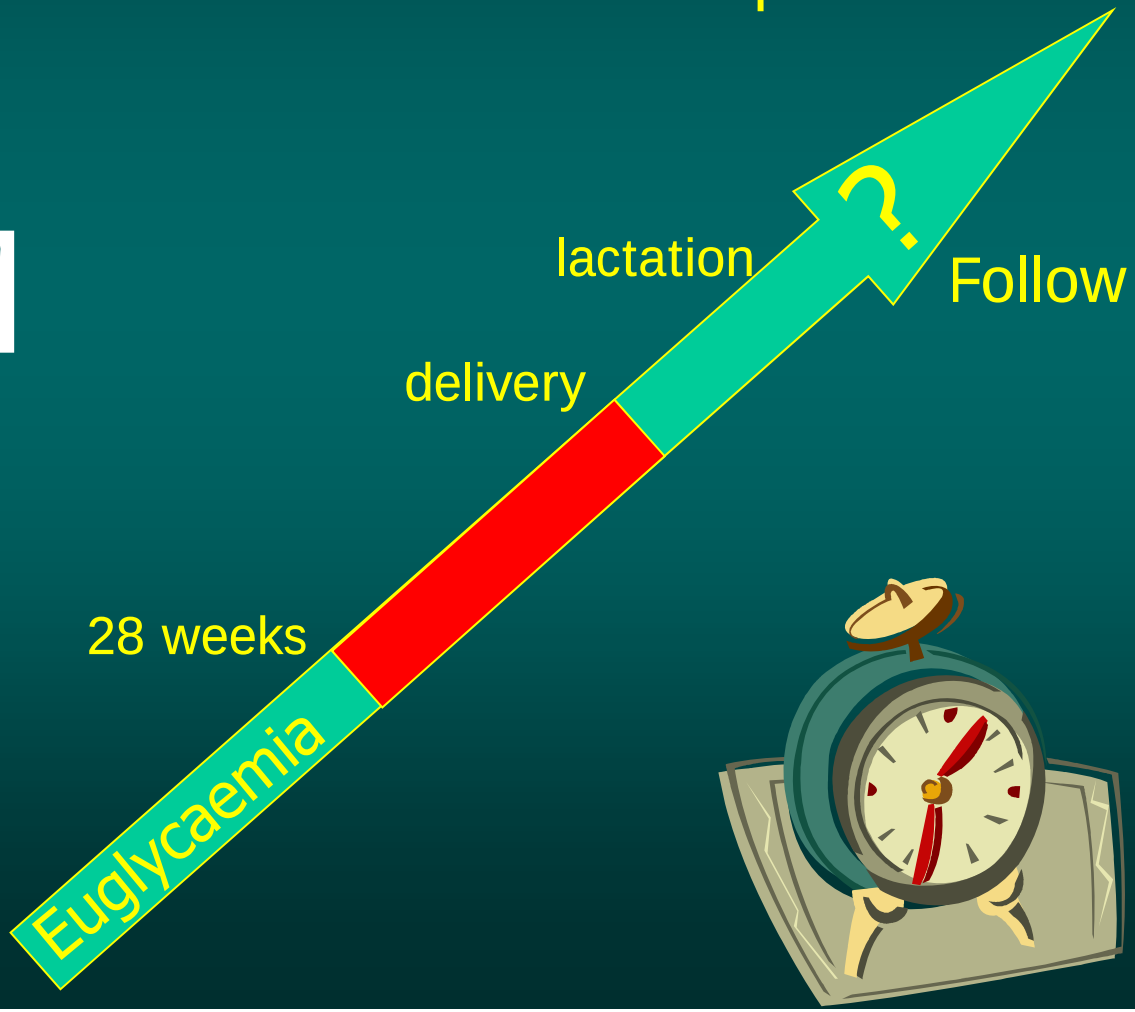
GDM



What is critical in taking care of pregnants affected by diabetes?

GDM:

1. Few weeks for diagnosis and treatment
2. The psychologic impact with the disease
3. The actors involved in the diagnosis are the same as for pregestational diabetes?

?

Diabetologist

Obstetrician

Gynecologist

Midwives

Specialized Nurse

Dietitian

?

GDM: Primary care

- Information;
- To evaluate the risk factors;
- To promote the right behaviour (diet, physical activity, etc);
- To act as a filter for the secondary care (Diabetology Center, Perinatal Care).

Right information about planning of the pregnancy in obese and high risk women

Multidisciplinary TEAM

Diabetologist

General Pract.

Ginecolo
Obstetric

etitian

Neonatologist

Specialist
Nurse

Team work: Our experience

	Overall (167)	Obese (50)	Non Obese (117)
Pregestational BMI	27,6±6,6	34,9±4,6	23,5±2,8
GA at diagnosis	24,7±7,9	21.5±9.0	26.7±6.2

Team work: Our experience

Maternal – Obstetric Outcomes	Overall (167)	Obese (50)	Non Obese (117)
Caucasian (%)	54	31	66
Ponderal increments at delivery	10,8±5,3	7.2±5.6	12.6±4.2
Insulin therapy N (%)	75	83	72
Gestational Hypertension (%)	12,5	27	5
GA at delivery	38±1.9	37.4±2.3	38.3±1.7
Caesarean Section (%)	56	66	51

Team work: Our experience

Neonatal Outcomes	Overall (167)	Obese (50)	Non Obese (117)
Neonatal Transitory Tachipnea TTN (%)	7 %	7 %	7 %
NICU admission (RDS)	2	2	0
Hypoglycemia (<30 mg%) (1°h)(%)	7	5 (10)	2(1,7)
Ponderal Index	2.6±0.3	2.59±0.3	2.65±0.3
Hospital stay	4.3±2.9	5.2±4.2	4±2

Fetal or Maternal perspective?

Diabetes in pregnancy has evolved as a full-fledged subspecialty with integral components such as pre-existing diabetes, gestational diabetes, and metabolic syndrome in pregnancy and sub-classifications within each major category to address the growing epidemic proportions of women whose pregnancy is compromised by diabetes.

O. Langer 2005

CONCLUSIONS

PREGNANCY: stress test

metabolic syndrome

METABOLIC MONITORING

OXIDATIVE STRESS

TARGETS in preGDM: malformations

abortion, stillbirth

TARGETS in GDM: growth & maturity

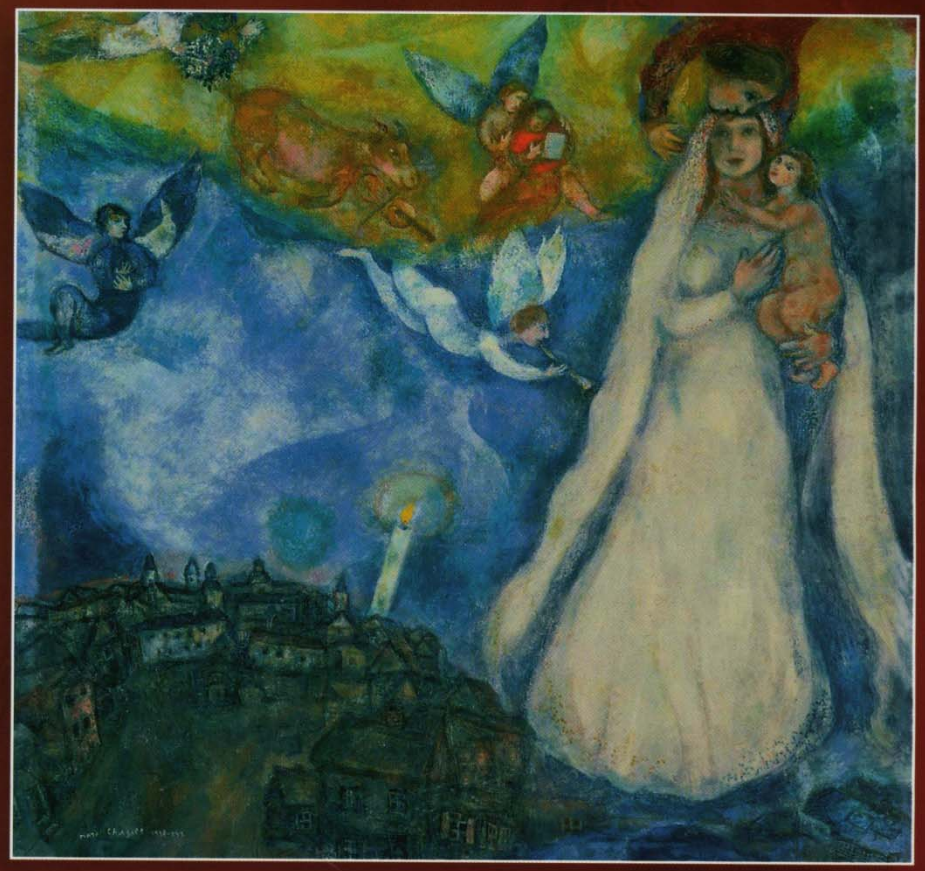
TEAMWORK

PERICONCEPTIONAL COUNSELING

Textbook of

Diabetes and Pregnancy

Second Edition



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informa
healthcare

Discovery consists of seeing what everyone has seen and thinking what nobody has thought.

Albert von Szent Gyorg


GRAZIE
THANK YOU!