

Obesity in pregnancy

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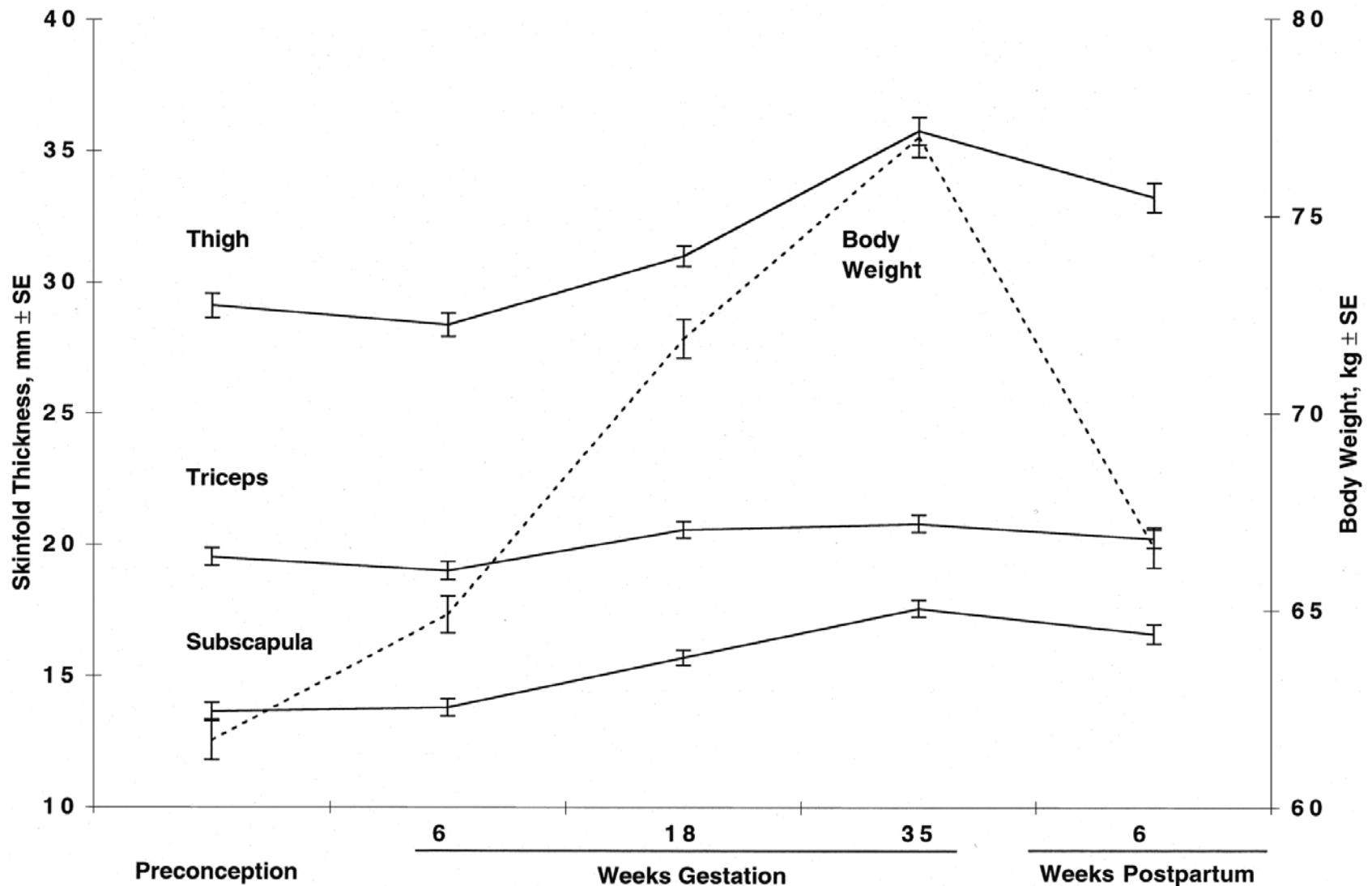
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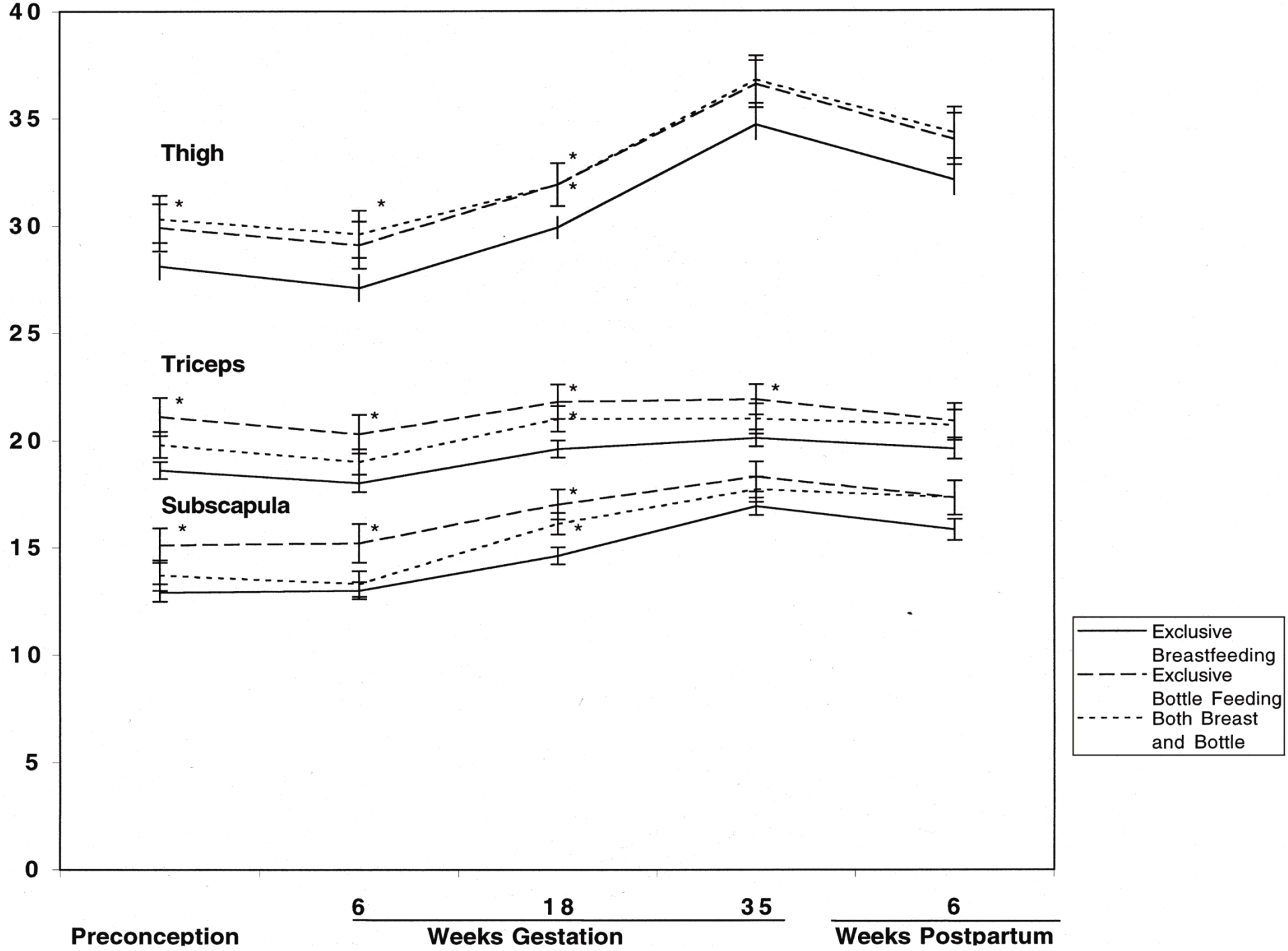
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- 1. Assessment of Obesity in pregnancy**
- 2. Obesity and pregnancy risks**
- 3. Management of obesity in pregnancy**

Adipose tissue deposition during pregnancy

(Sidebottom et al. Eur. J. Obs. Gyn 2001)

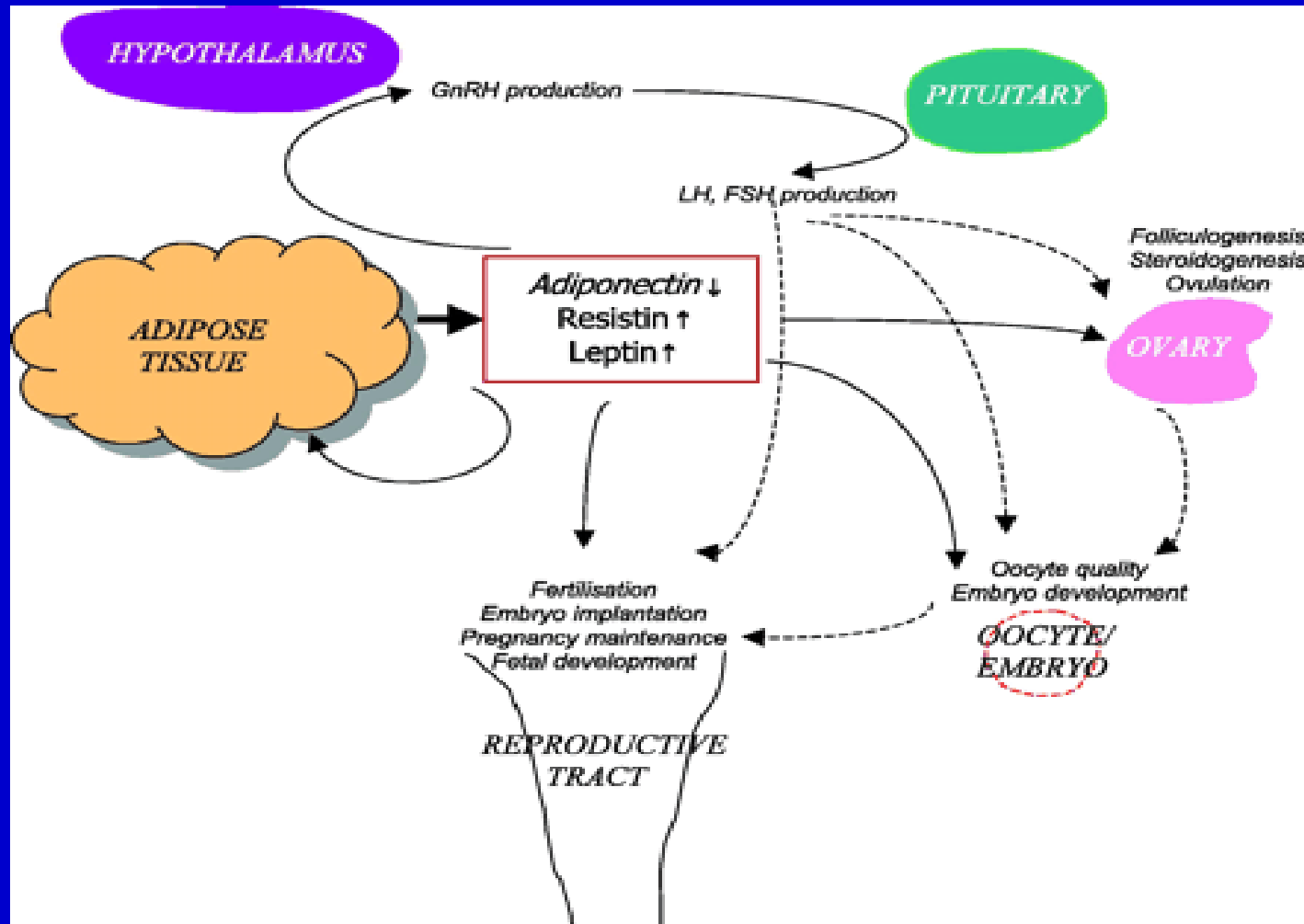




Cytokines production in pregnancy

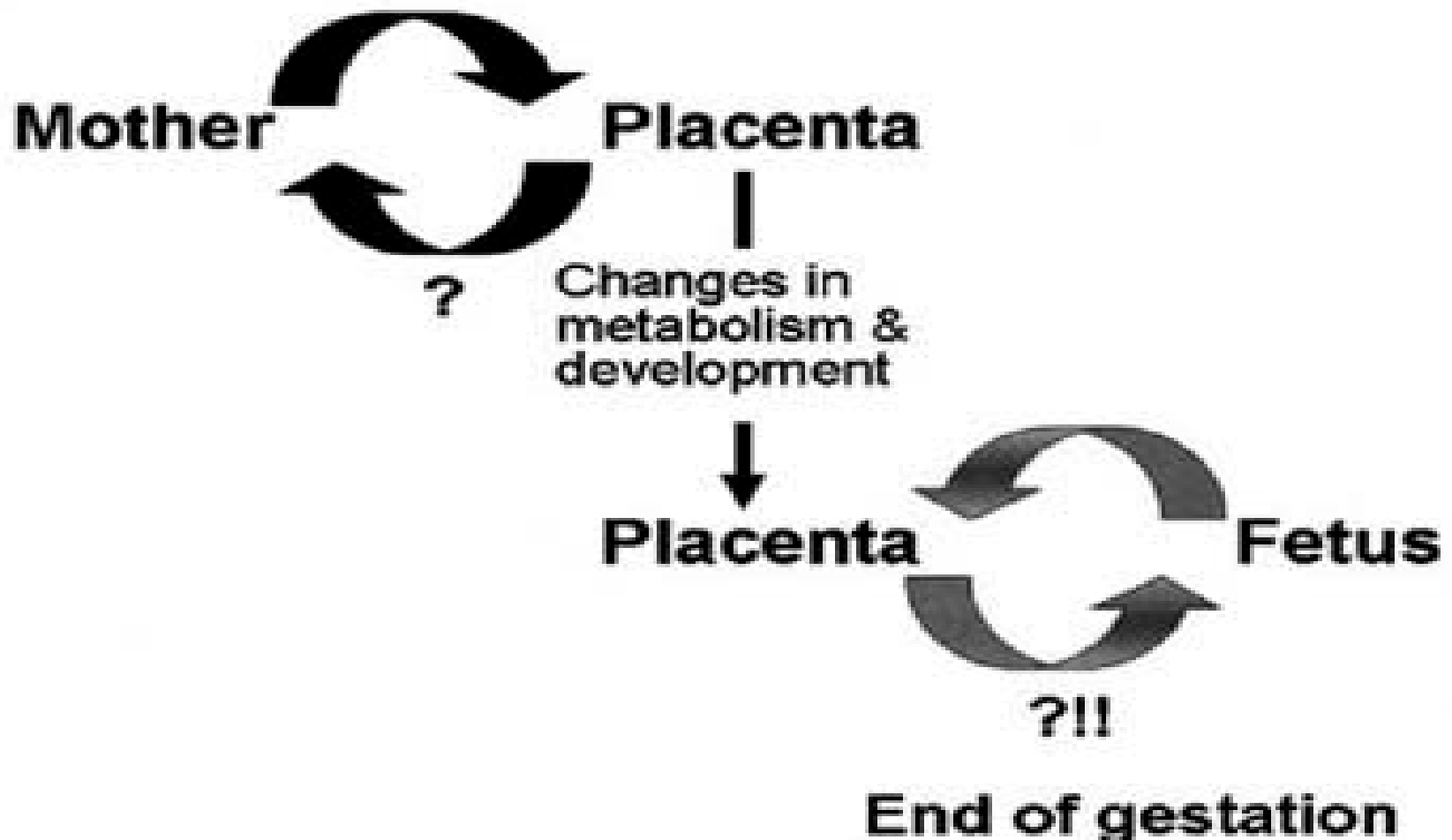
	Adipocyte	SVF	Placenta
TNF- α	+	+	+
IL-6	+	+	+
IL-1b		+	
IL-8	+	+	+
IL-1Ra	+	+	+
IL-10	+	+	+
Leptin	+	0	+
Adiponectin	+	0	-
Resistin	0	+	+
MCP-1	+	+	+
MIF	+	+	+
VEGF	+	+	+
PAI-1	+	+	+
Cathepsin S	+	+	+

Adipose tissue and female fertility axis

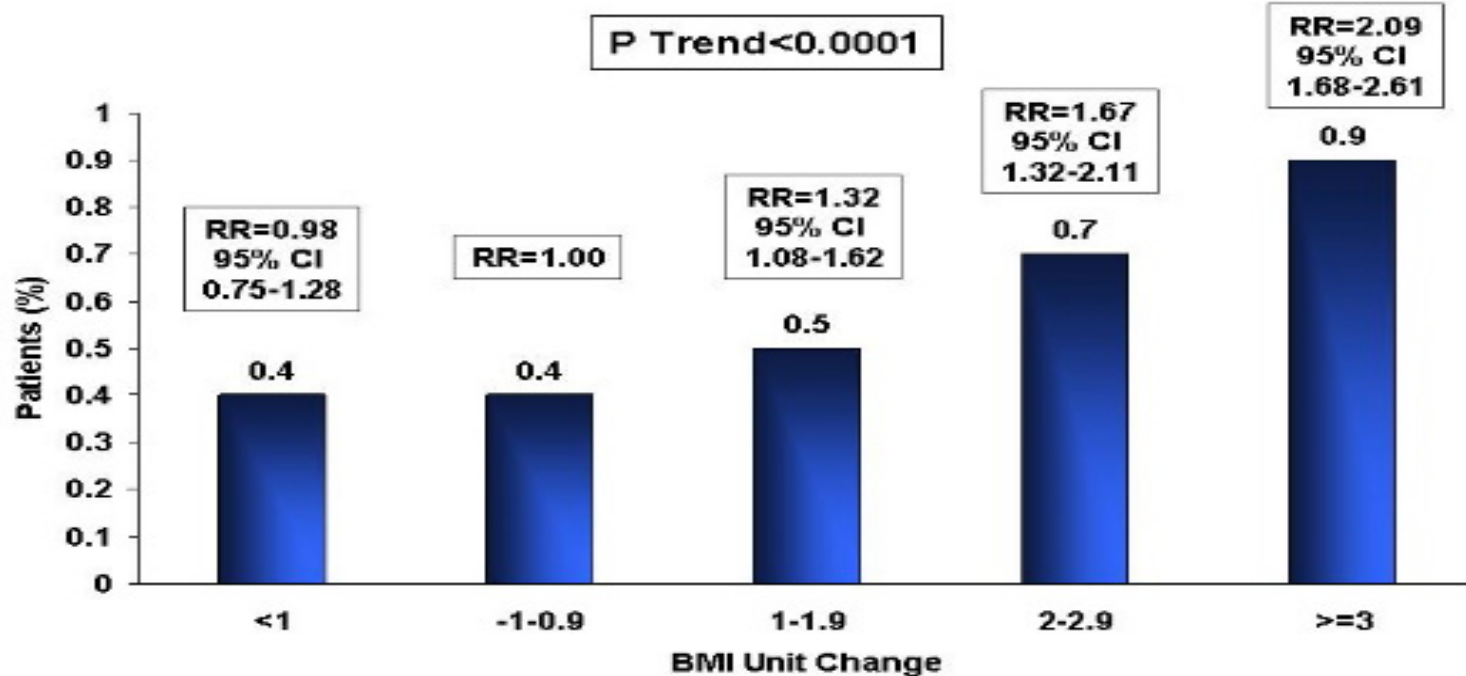


Adipose tissue in Pregnancy: Metabolic effects for two

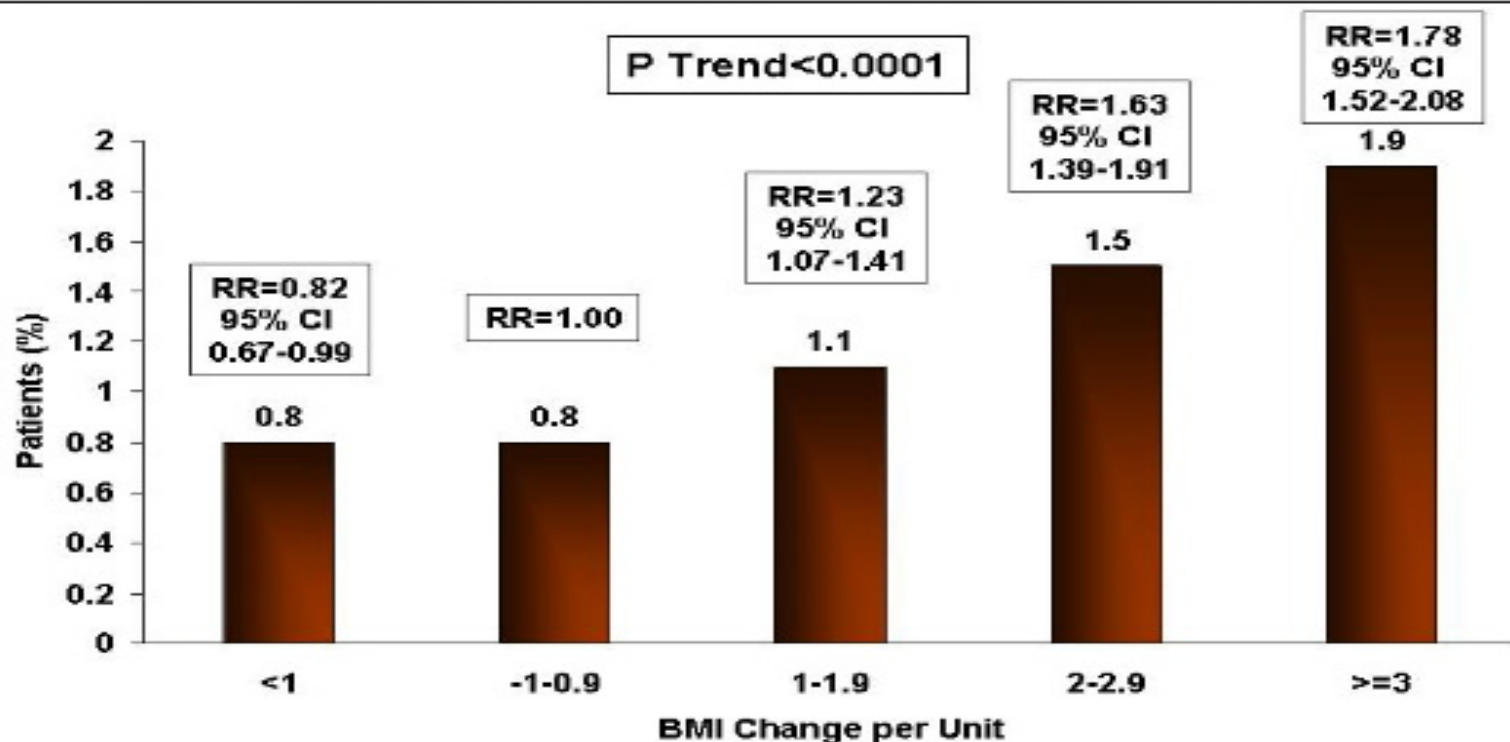
First trimester



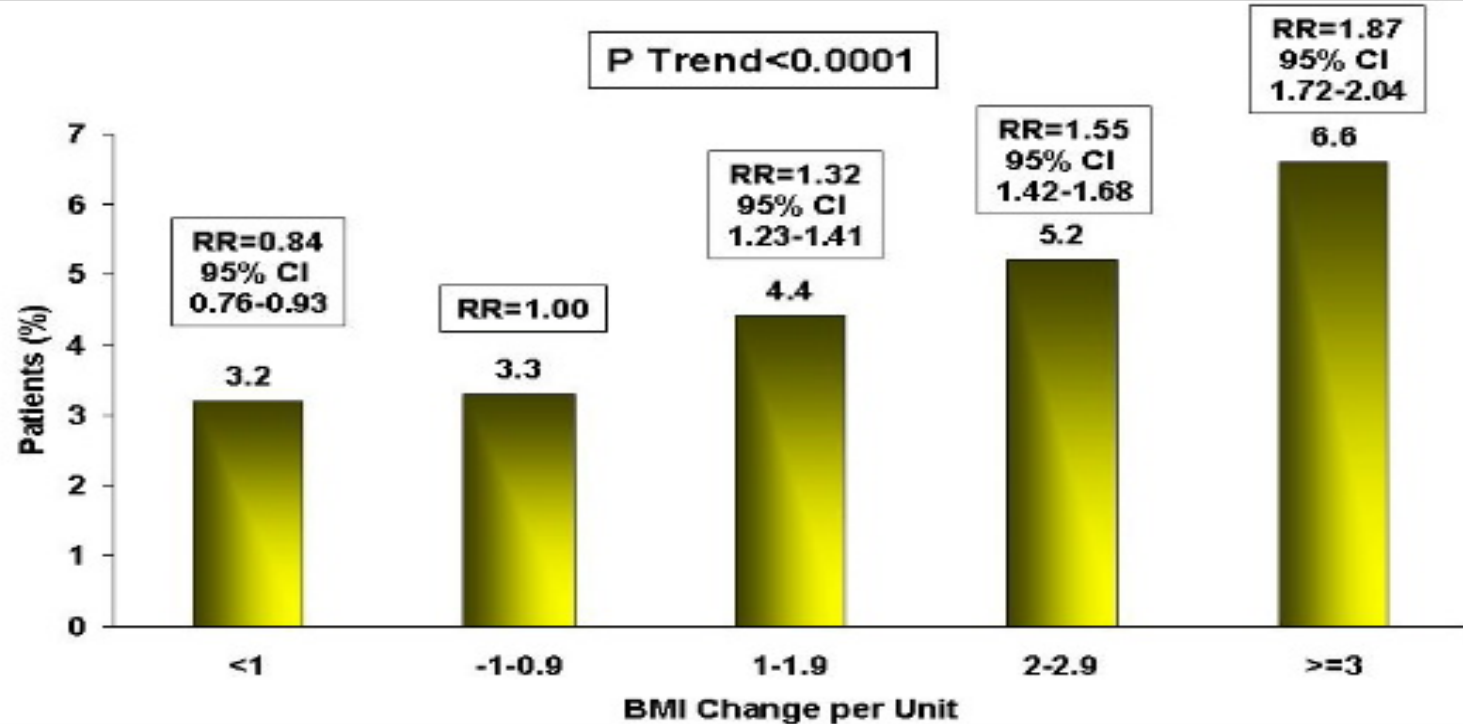
Risk of GDM according to BMI change in pregnancy



Risk of preeclampsia according to BMI change in pregnancy



Risk of large fetal gestational weight according to maternal BMI change



Fetal outcomes and maternal pre-pregnancy weight (BMI)

- Large for gestational age
- Birth weight >4000gr
- Neonatal hypoglycemia
- Respiratory distress syndrome
- Jaundice
- Perinatal mortality
- Congenital malformations

Pregravid maternal BMI and neonatal body composition (Sewell et al.)

Pregravid BMI	BMI>25	BMI<25	P-value
Birth weight (gr)	3436 ± 567	3284 ± 534	0.051
LBM (gr)	3023 ± 410	2951 ± 406	0.22
Fat mass (gr)	416 ± 221	334 ± 179	0.008
Body fat (%)	11.6 ± 4.7	9.7 ± 4.3	0.006
Maternal weight gain	6.3 ± 3.4	6.9 ± 2.4	0.001

Prevalence of obesity (BMI>95% age and gender) in offspring of obese women

Prevalence of obesity	age
9.5%	2
12.5%	3
14.8%	4
(Whitaker et al. Pediatrics)	

Maternal overweight and independent fetal morbidity

- 1) teratogenic fuel mediated effect (insulin, triglycerides, uric acid, estrogens)
- 2) Insufficient folate intake
- (Rasmussen Am J Obstet Gynecol 2008)

Malformations incidence according to maternal BMI

- 1) NTD and other CVS effects
- BMI 25-29.9 1.22
- BMI 30-35 1.7
- BMI >36 3.11

- 2) Heart defects
- 3) Abdominal wall abnormalities & GIT
- (Rasmussen Am J Obstet Gynecol 2008)

Institute of Medicine recommendations 2009

Pre-gestational BMI (kg/m ²)	Recommended gestational weight gain (kg)
<18.5	14-20
18.5-24.9	12.5-17.5
25-29.9	7.5-12.5
>30	5.5-10

Arguments against weight loss in pregnancy (DIP Salzburg 2011)

- 1) Do not advise until additional studies demonstrate benefits and no adverse consequences to the mother and or fetus
- Contrarian view: Studies are available additional weight gain is detrimental

- 2) "Obligatory" physiological changes that should result in a net maternal gain (average 4-5 kg)
- Contrarian view: The concept implies risks and is not supported by data

- 3) Ketonuria/ketonemia causes delayed neurodevelopment
- Contrarian view: No credible data to support this myth

- 4) Weight loss will result in SGA newborns
- Contrarian view: In the higher BMIs the effect is minimal

Summary

- Obesity per se is a risk factor for various complications during pregnancy
- Pregnancy outcome in obese women might benefit from restricted weight gain during pregnancy
- Prevention and treatment of obesity before pregnancy is mandatory
- Intervention studies during pregnancy on diet, weight restriction and exercise are needed