IN SUMMARY

MATERNAL PHYSIOLOGIC CHANGES IN PREGNANCY

MATERNAL PHYSIOLOGY

Cardiovascular System

- Heart size increases 12%
- Murmurs (systolic and diastolic)
- ECG changes similar to ischemia but due to positional changes
- Extrasystoles, supraventricular tachycardia
- Output rises 1.5 liters/minute
- Heart rate rises from 70 to 85 beats per minute

- Stroke volume rises from 63 to 70 ml
- A-V oxygen difference drops near end of first trimester from 44 to 33 ml/l but then rises again
- Blood pressure
  - Systolic unchanged
  - Diastolic drops in mid-pregnancy
  - Increases again near term

- Pulse pressure higher
- Venous pressure unchanged in the arms and raised in the legs
- Peripheral resistance drops
- Pulmonary pressure unchanged
- Circulation time unchanged

Figure removed due to copyright restrictions. Please see:

Elkayam, Uri, and Norbert Gleicher, eds. *Cardiac Problems in Pregnancy : Diagnosis and Management of Maternal and Fetal Disease.* 2nd ed. New York, NY: Liss, 1990, p. 61. ISBN: 0471505005 .

Figure removed due to copyright restrictions.
[bar graph of Cardiac Output (L/min) vs Weeks Gestation]

- Cardiac output +43%
- SVR -21%
- PVR -34%
- HR +17%
- Stroke index +17%
- MAP -4%
- Osmotic pressure -14%

Pulmonary

Figure removed due to copyright restrictions.
[graph showing Lung Volume Compartments corresponding to Months Pregnant]

- Inspiratory capacity goes up
- Vital capacity unchanged
- Functional residual capacity goes down
- Mother notes subjective dyspnea as pregnancy advances
- Seen as early as 12 weeks
- Progesterone effect

Glucose Metabolism

- Mean blood glucose drops
- Basal and total insulin goes up
- Daily glucose excretion goes up due to elevated GFR and fixed rate of reabsorption
- Oral 100 gram glucose tolerance test or 50 gram 1 hour glucose challenge test
- Hemoglobin A1c is good measure of long term control
- A1c related to incidence of congenital malformations
- Malformations
    - Cardiac
    - Gastrointestinal
    - Genitourinary
    - Central nervous system

Laboratory parameter effects of pregnancy

- Lower hematocrit (although elevated red cell mass)
- Creatinine clearance rises (creatinine falls)
- BUN falls
- Plasma volume goes up
- Serum sodium falls
- Estrogen levels (all three estrogens) rise
- LH, FSH fall
- Prolactin rises
- TSH unchanged

FUNDAMENTAL QUESTIONS

1. Describe the changes in cardiovascular parameters in pregnancy?
2. What changes in pulmonary function are to be expected? Why do these occur?
3. Describe the changes in renal function as pregnancy progresses.
4. What happens to serum glucose and insulin as pregnancy advances?
5. What risks does diabetes confer on the fetus? Why?
6. What normally happens to the hematocrit and plasma volume in pregnancy?
7. What laboratory parameters rise and which ones fall in a normal pregnancy?
8. What is the most optimal physiologic position for a woman to labor?
9. Describe the changes in plasma glucose and insulin as pregnancy advances.
10. What happens to serum binding proteins in pregnancy? Why?