

Physiological adaptations of the female body to pregnancy.

1.) Hormonal adaptation: Pregnant women experience numerous adjustments in their endocrine system that help support the developing fetus. The fetal-placental unit secretes steroid hormones and proteins that alter the function of various maternal endocrine glands. Sometimes, the changes in certain hormone levels and their effects on their target organs can lead to gestational diabetes and gestational hypertension.

2.) Hematology: During pregnancy the plasma volume increases by 40-50% and the red blood cell volume increases only by 20-30%. These changes occur mostly in the second trimester and prior to 32 weeks gestation.[19] Due to dilution, the net result is a decrease in hematocrit or hemoglobin, which are measures of red blood cell concentration. Erythropoietin, which stimulates red blood cell production,



increases throughout pregnancy and reaches approximately 150 percent of their pregnancy levels at term. The slight drop in hematocrit or hemoglobin is most pronounced at the end of the second trimester and slowly improves when reaching term.

3.) Increase in breast size: A woman's breasts grow during pregnancy, usually 1 to 2 cup sizes and potentially several cup sizes. A woman's torso also grows and her bra band size may increase one or two sizes. Once the baby is born up to about 50–73 hours after birth, the mother will experience her breasts filling with milk. Once lactation begins, the woman's breasts swell significantly and can feel achy, lumpy and heavy (which is referred to as engorgement). Her breasts may increase in size again by an additional 1 or 2 cup sizes, but individual breast size may vary depending on how much the infant nurses from each breast. A regular pattern of breast feeding is generally established after 8–12 weeks, and a woman's breasts will usually reduce in



size, but may remain about 1 cup size larger than prior to her pregnancy.

4.) Cardiovascular adaptation: Cardiac output increases throughout early pregnancy, and peaks in the third trimester, usually to 30-50% above baseline. Estrogen mediates this rise in cardiac output by increasing the pre-load and stroke volume, mainly via a higher overall blood volume (which increases by 40–50%). The heart rate increases, but generally not above 100 beats/ minute. Total systematic vascular resistance decreases by 20% secondary to the vasodilatory effect of progesterone. Overall, the systolic and diastolic blood pressure drops 10–15 mm Hg in the first trimester and then returns to baseline in the second half of pregnancy.

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5.) Respiratory adaptation: There are many physiologic changes that occur during pregnancy that influence respiratory status and function. Progesterone has noticeable effects on respiratory physiology, increasing minute volume in the first trimester via an increase in tidal volume alone, as the respiratory rate does not change during pregnancy. As a result, carbon dioxide levels in the blood decrease and the pH of the blood becomes more alkaline (i.e. the pH is higher and more basic). This causes the maternal kidneys to excrete bicarbonate to compensate for this change in pH. The combined effect of the decreased serum concentrations of both carbon dioxide and bicarbonate leads to a slight overall increase in blood pH (to 7.44 compared to 7.40 in the non-pregnant state).

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Oxygen consumption increases by 20% to 40% during pregnancy, as the oxygen demand of the growing fetus, placenta, and increased metabolic activity of the maternal organs all increase the pregnant person's overall oxygen requirements. Ex

