PREMENSTRUAL PHASE

- 2-3 days before menstruation
- marked decrease in estrogen and progesterone
- collapse of glands due to loss of tissue fluid
- intense coiling of spiral arteries
  - resistance to blood flow
  - hypoxia
  - vasoconstriction (24-36hrs pre menses)
  - vasodilation (24-36hrs after VC)
  - bleeding

PREMENSTRUAL DISCOMFORT

1) swelling and tenderness of the breasts
2) bloated feeling in the abdomen
3) weight gain up to 5lbs
4) dysmenorrhea
5) low back pain
6) pimples
7) mild fatigue and irritability
8) increased perspiration

MECHANISMS of REPRODUCTION

MITOSIS

- process of cell division giving rise to 2 daughter cells that are genetically identical to the parent cell
- each duaghter cellr receives the complete complement of 46 chromosomes
- stages
  - *Prophase*
    - chromosomes begin to coil, shorten and thicken
  - *Metaphase*
    - chromosomes line up in the equatorial plane
    - each chromosome is attached by microtubules extending from the centromere to the centriole, forming the *mitotic spindle*
  - *Telophase*
    b) chromosomes uncoil and lengthen
    c) nuclear envelope forms
    d) cytoplasm divides

MEIOSIS

- the cell division that takes place in the GERM CELLS to generate male and female gametes, sperm and egg cells
- requires two cell divisions, MEIOSIS I and MEIOSIS II, to reduce the number of chromosomes to the haploid number of 23
- significance
  a) Crossover enhances genetic varioablity which redistributes genetic material
  b) each germ cell contains a haploid number of chromosomes, so that at fertilization the diploid number of 46 is restored

OOGENESIS

- near birth, all primary oocytes have started prophase of meisosis I
- instead of proceeding into metaphase, they enter the DIPLOTENE stage, a resting stage during prophase and will remain until just before ovulation
- during ovulation: enter metaphase of the first meiotic division
- oocyte maturation inhibitor (OMI), a substance secreted by follicular cells
  - primary oocytes at birth - 700,000 to 2M
  - puberty - 400,000- < 500 will be ovulated
- Meiosis II is completed only if the oocyte is fertilized otherwise, the cell degenerates approximately 24hrs after ovulation

SPERMIOGENESIS

- from spermatids into spermatozoa
  a) formation of the acrosome
  b) condensation of the nucleus
  c) formation of neck, middle piece, and tail
  d) shedding of most of the cytoplasm
- spermatogonium to mature spermatozoon - 64 days

BLASTOCYST

- cells undergo differentiation and morphogenesis
- cells of the trophoblast mediate the implantation of the blastocyst into the uterine wall
- implantation begins when blastocyst comes in contact with the ENDOMETRIUM

IMPLANTATION

- takes place during the second week of development
- trophoblast cells surrounding the blastocyst secrete digestive enzymes that break down the endometrial cells
- *Syncytiotrophoblast*
  - the trophoblast that grows into the endometrium
- cytotrophoblast