

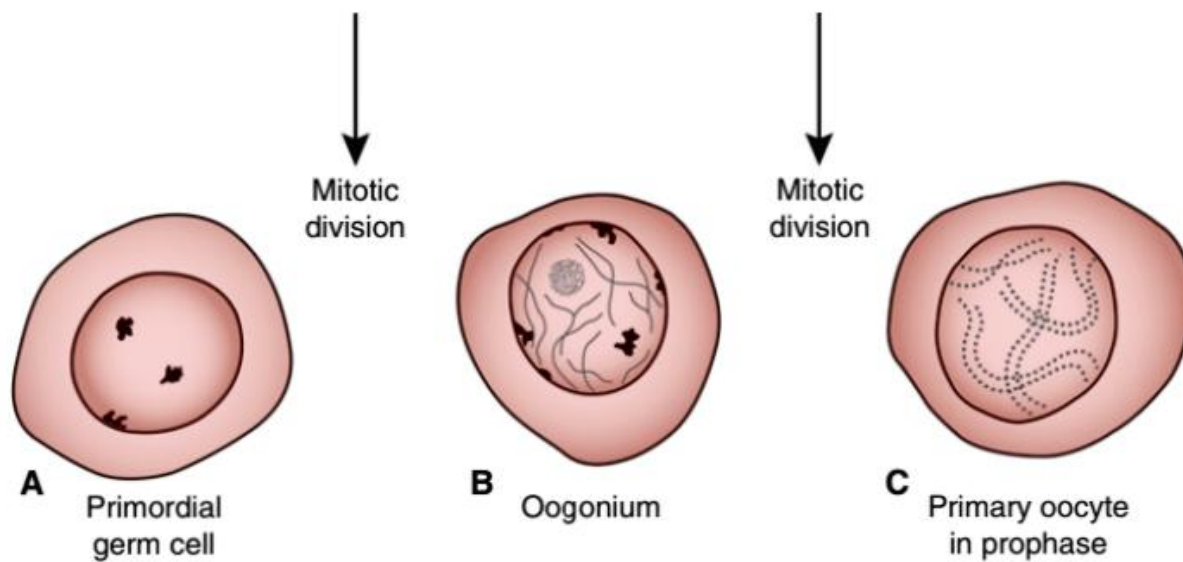
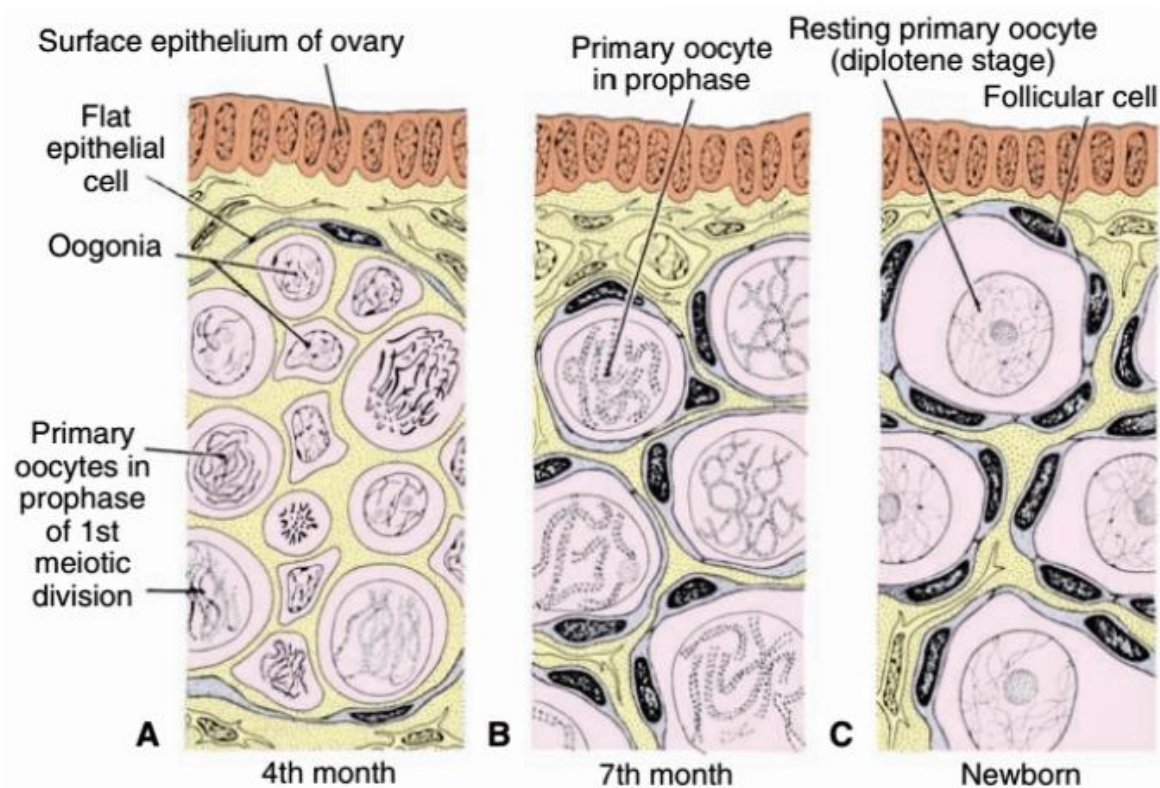


Figure 2.16 Differentiation of PGCs into oogonia begins shortly after their arrival in the ovary. By the third month of development, some oogonia give rise to primary oocytes that enter prophase of the first meiotic division. This prophase may last 40 or more years and finishes only when the cell begins its final maturation. During this period, it carries 46 double-structured chromosomes.

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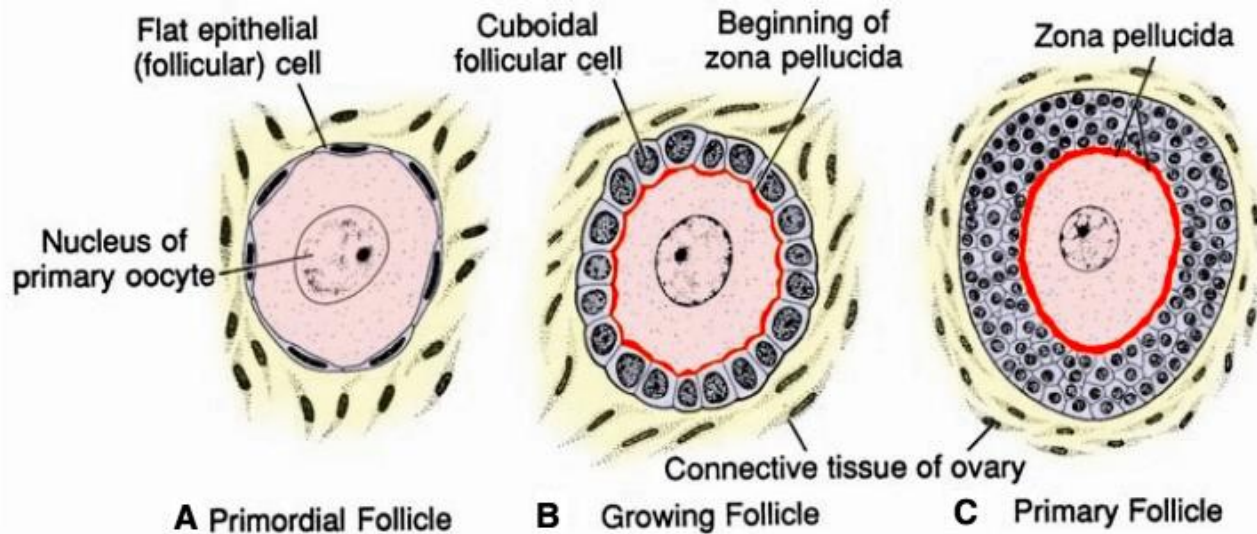


Figure 2.18 **A.** Primordial follicle consisting of a primary oocyte surrounded by a layer of flattened epithelial cells. **B.** Early primary or preantral stage follicle recruited from the pool of primordial follicles. As the follicle grows, follicular cells become cuboidal and begin to secrete the zona pellucida, which is visible in irregular patches on the surface of the oocyte. **C.** Mature primary (preantral) follicle with follicular cells forming a stratified layer of granulosa cells around the oocyte and the presence of a well-defined zona pellucida.

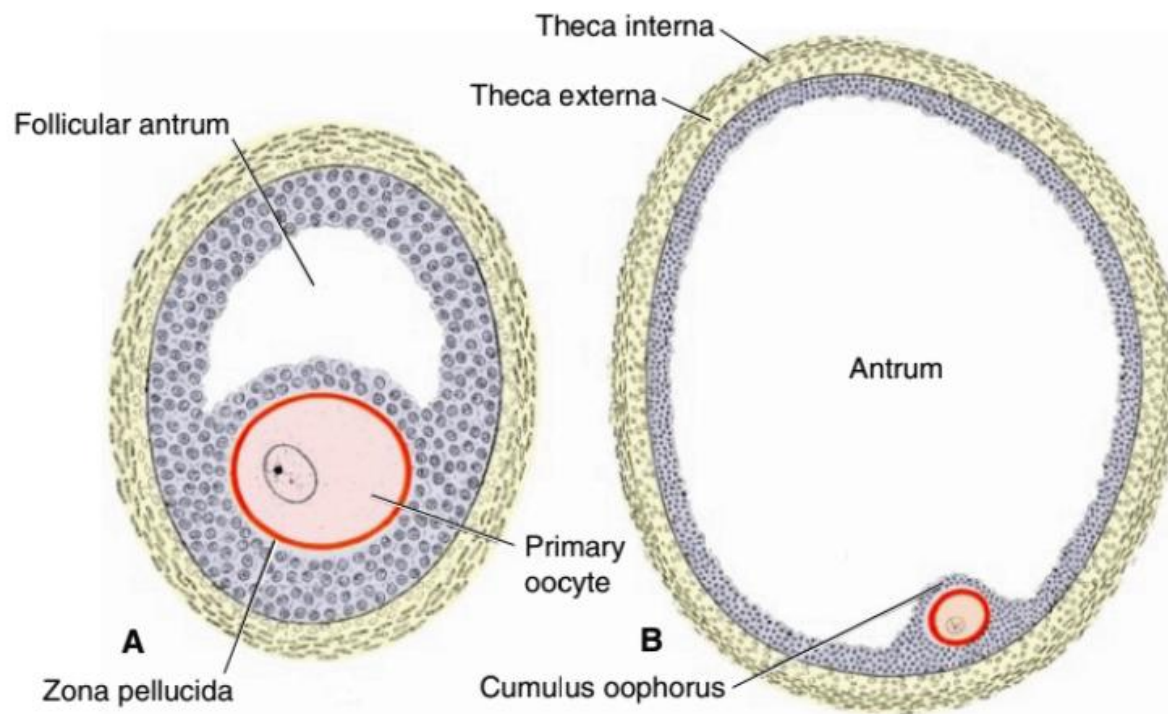


Figure 2.19 **A.** Vesicular (antral) stage follicle. The oocyte, surrounded by the zona pellucida, is off center; the antrum has developed by fluid accumulation between intercellular spaces. Note the arrangement of cells of the theca interna and the theca externa. **B.** Mature vesicular (Graafian) follicle. The antrum has enlarged considerably, is filled with follicular fluid, and is surrounded by a stratified layer of granulosa cells. The oocyte is embedded in a mound of granulosa cells, the cumulus oophorus.

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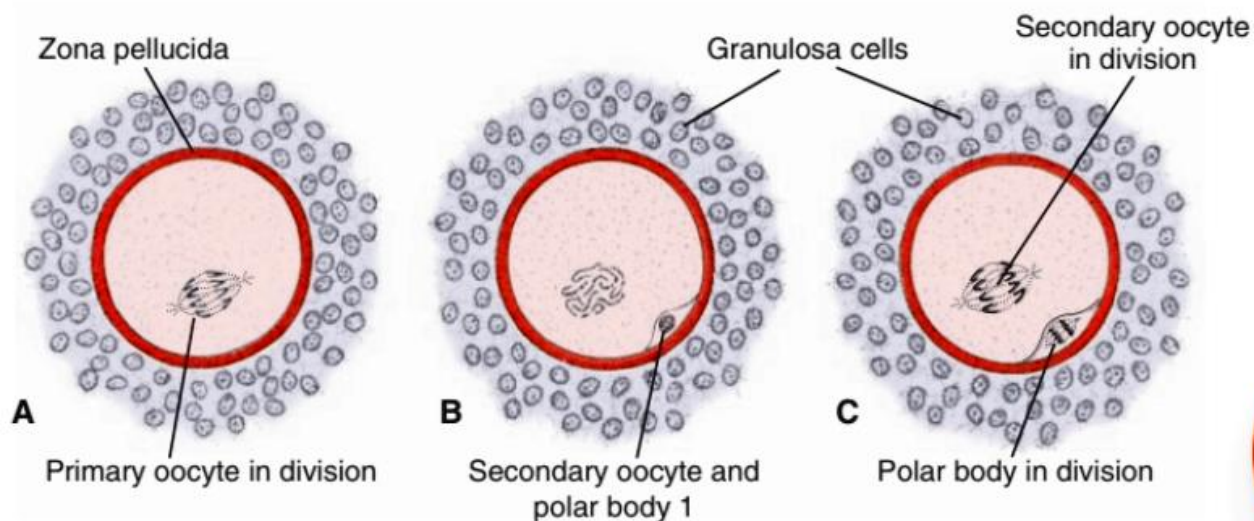


Figure 2.20 Maturation of the oocyte. **A.** Primary oocyte showing the spindle of the first meiotic division. **B.** Secondary oocyte and first polar body. The nuclear membrane is absent. **C.** Secondary oocyte showing the spindle of the second meiotic division. The first polar body is also dividing.

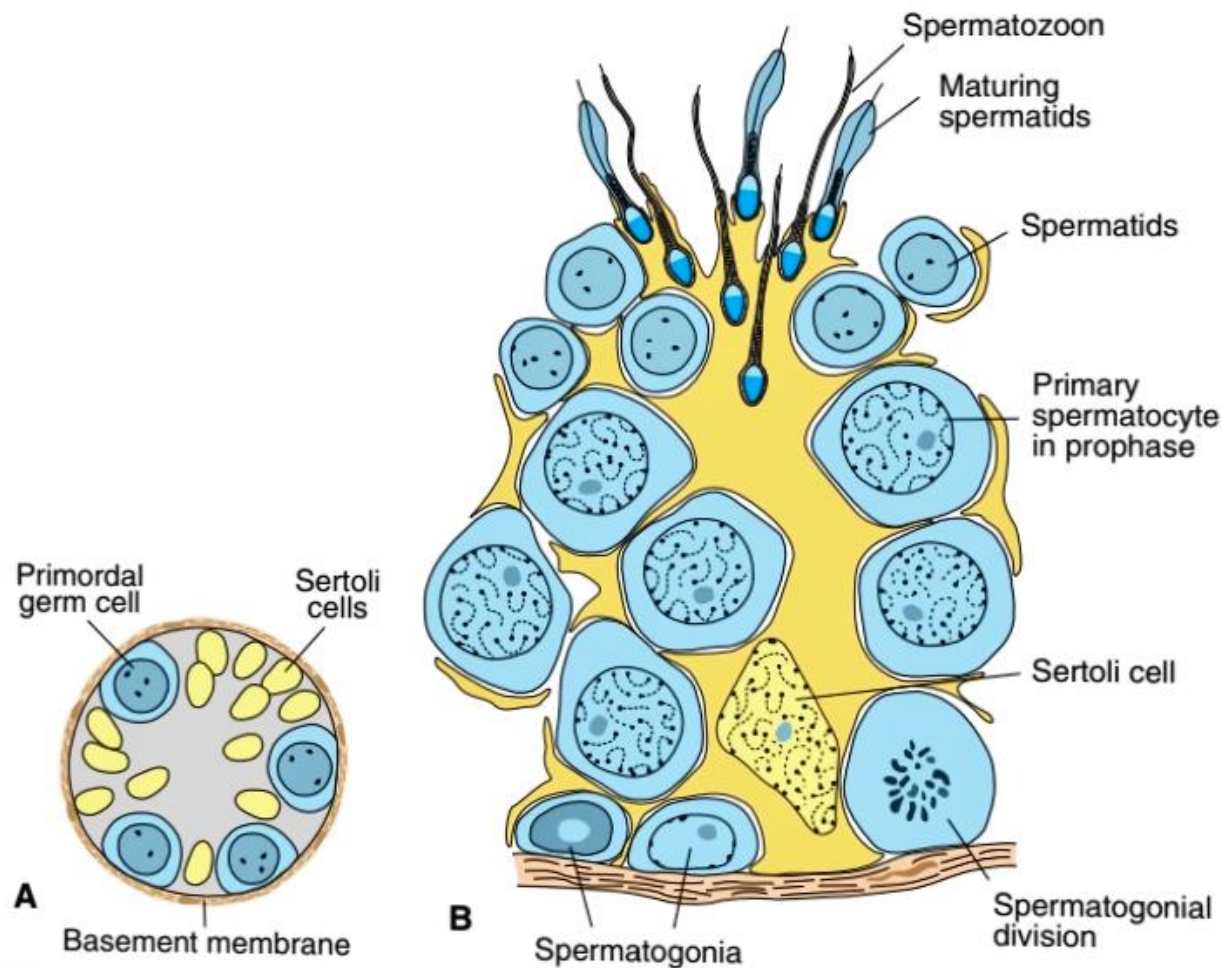


Figure 2.21 **A.** Cross section through primitive sex cords of a newborn boy showing PGCs and supporting cells. **B.** Cross section through a seminiferous tubule at puberty. Note the different stages of spermatogenesis and that developing sperm cells are embedded in the cytoplasmic processes of a supporting Sertoli cell.

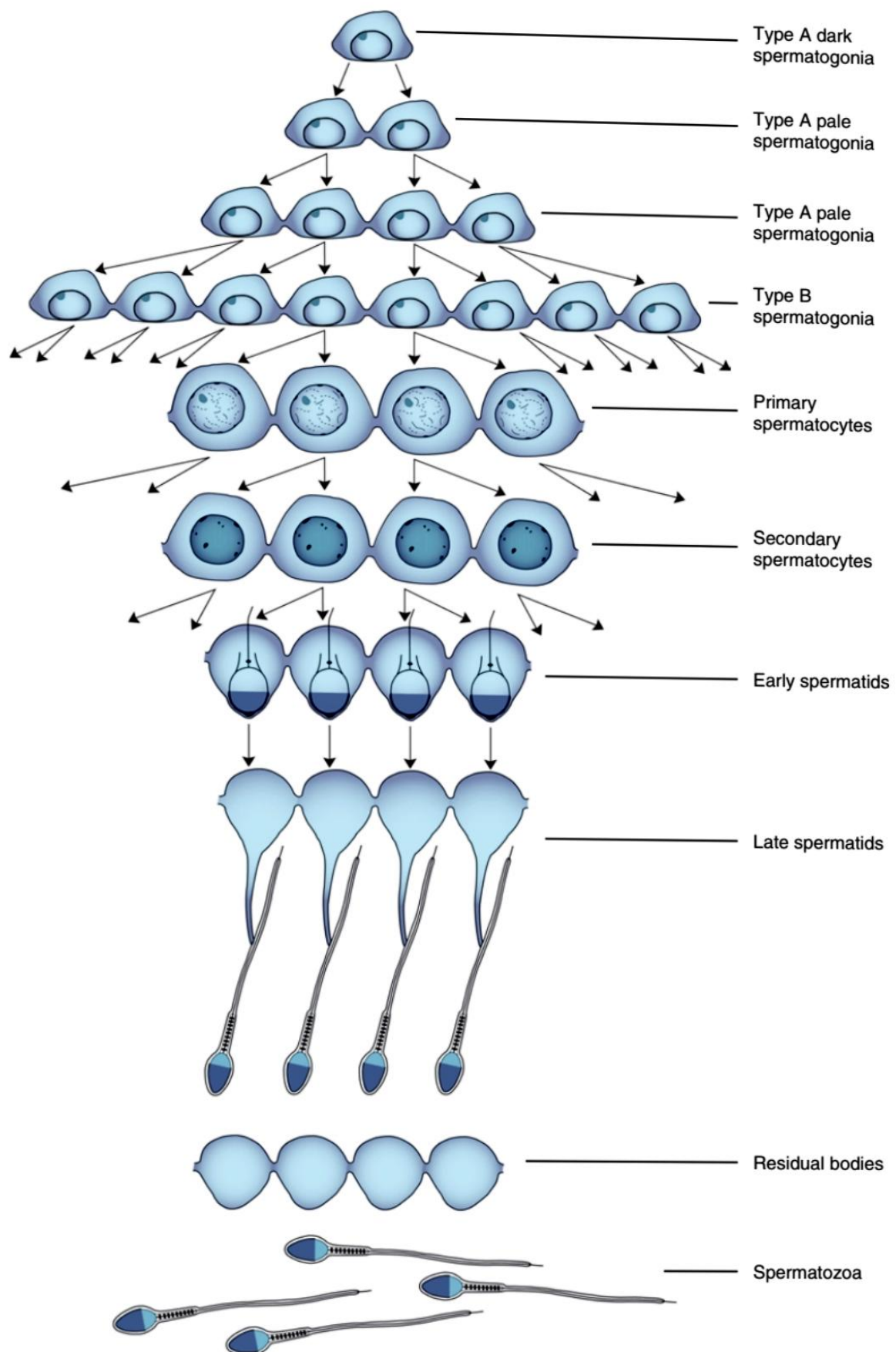


Figure 2.22 Type A spermatogonia, derived from the spermatogonial stem cell population, represent the first cells in the process of spermatogenesis. Clones of cells are established, and cytoplasmic bridges join cells in each succeeding division until individual sperm are separated from residual bodies. In fact, the number of individual interconnected cells is considerably greater than depicted in this figure.

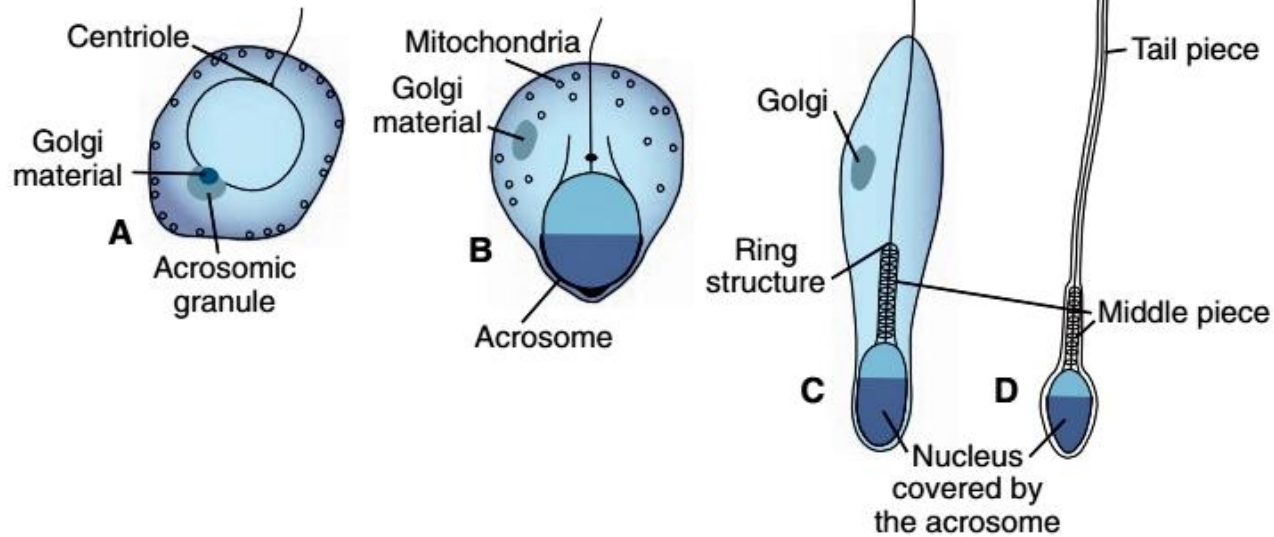


Figure 2.24 Important stages in transformation of the human spermatid into the spermatozoon.

Flowchart 3.1: Stages of spermatogenesis

Spermatogenesis

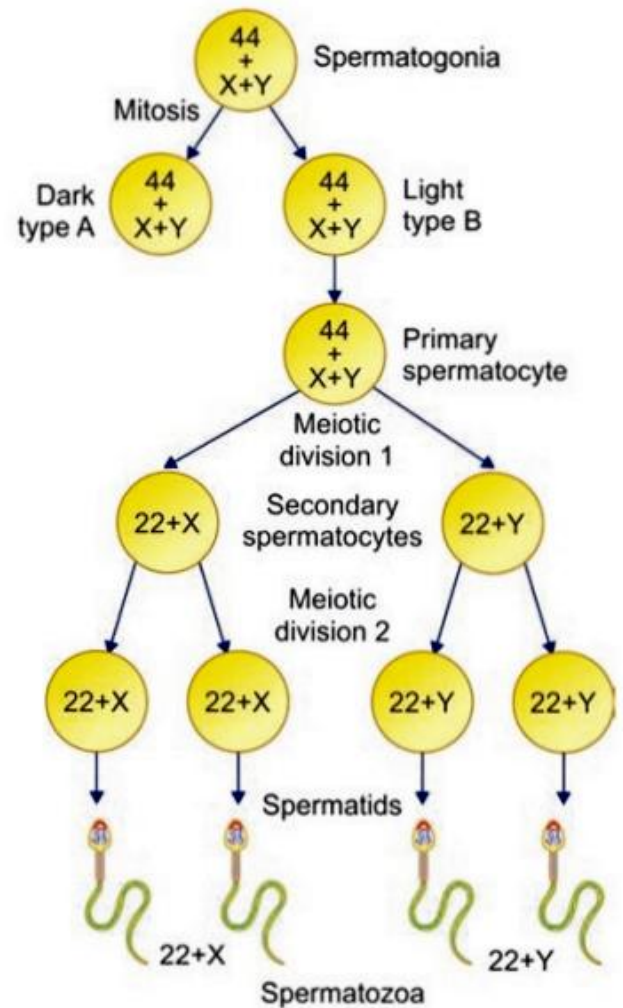
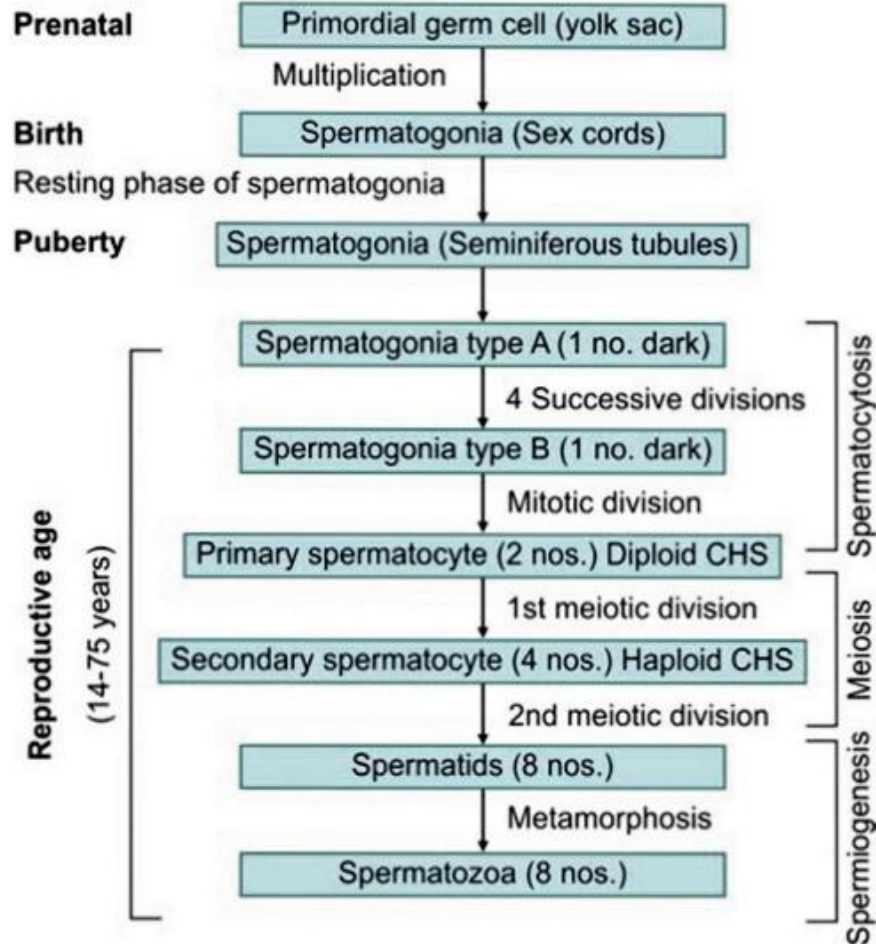


Fig. 3.9: Stages in spermatogenesis. Note the number of chromosomes at each stage

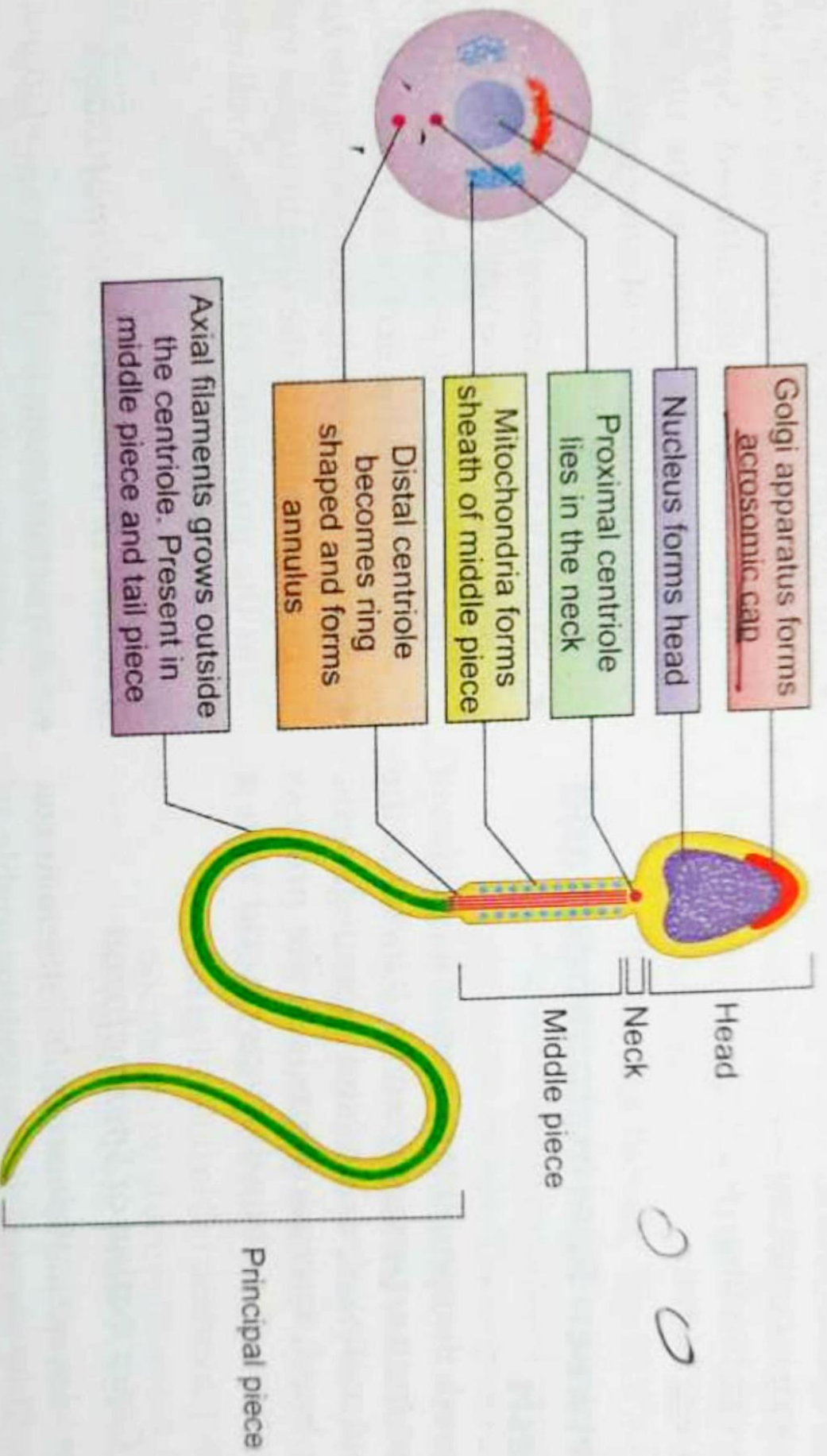


Fig. 3.10: Parts of a spermatozoon and their derivation

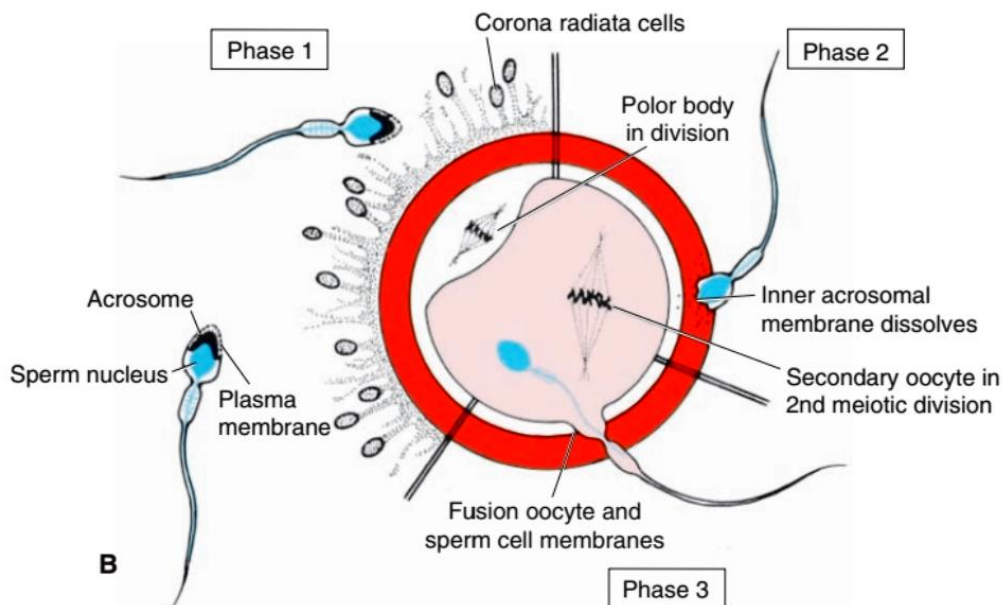


Figure 3.5 **A.** Scanning electron micrograph of sperm binding to the zona pellucida. **B.** The three phases of oocyte penetration. In phase 1, spermatozoa pass through the corona radiata barrier; in phase 2, one or more spermatozoa penetrate the zona pellucida; in phase 3, one spermatozoon penetrates the oocyte membrane while losing its own plasma membrane. Inset shows normal spermatocyte with acrosomal head cap.

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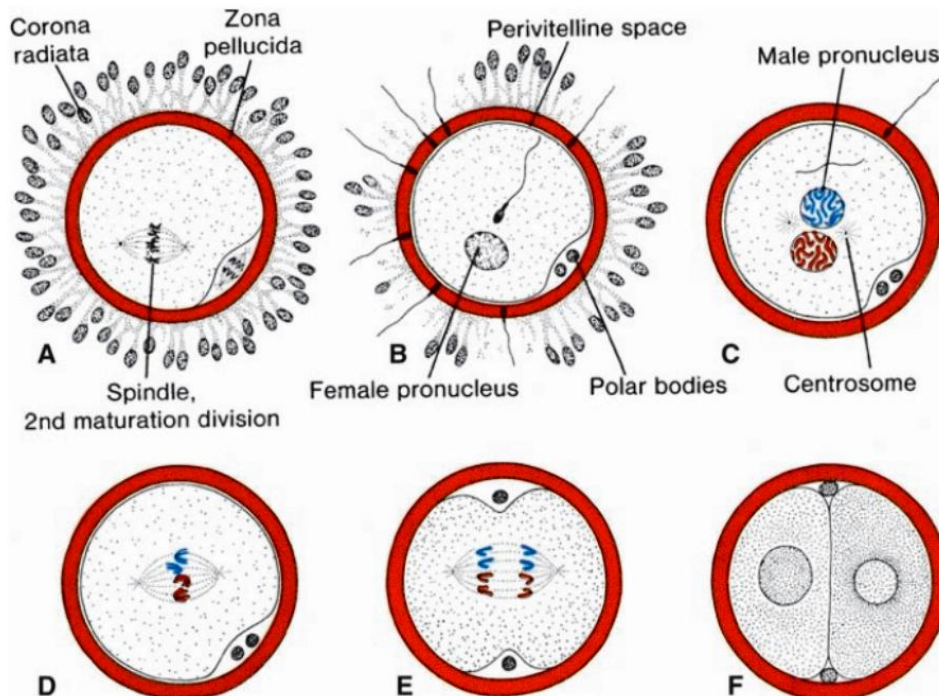
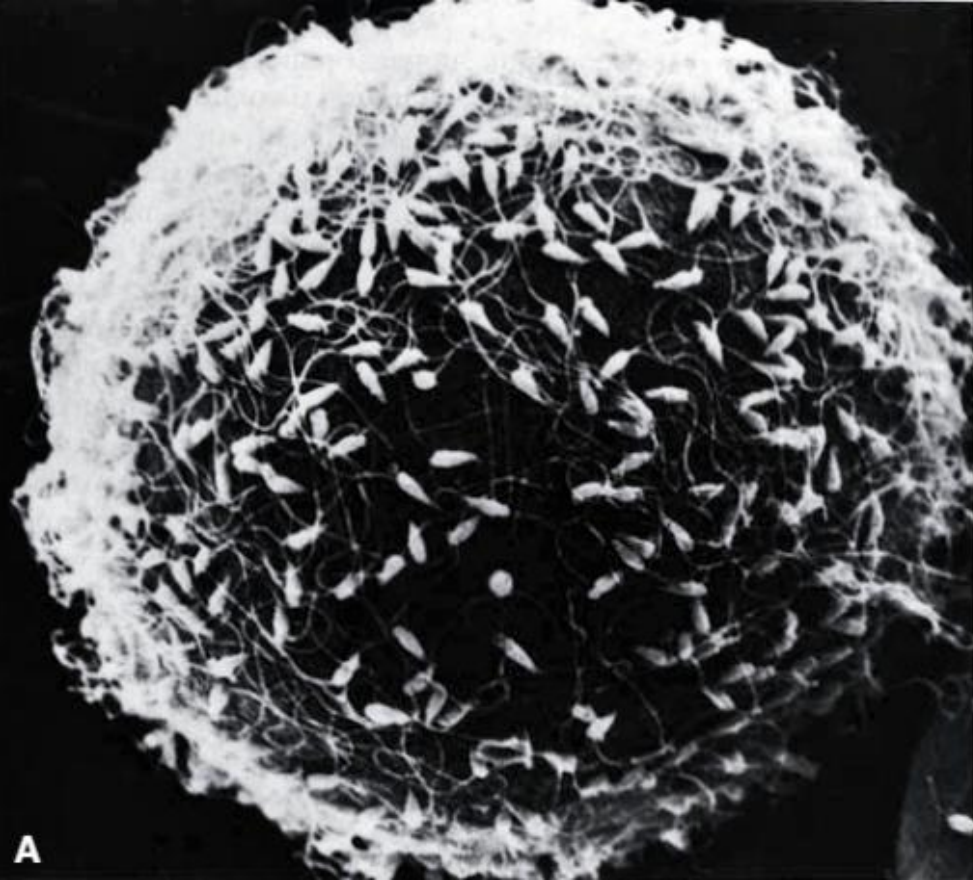


Figure 3.6 **A.** Oocyte immediately after ovulation, showing the spindle of the second meiotic division. **B.** A spermatozoon has penetrated the oocyte, which has finished its second meiotic division. Chromosomes of the oocyte are arranged in a vesicular nucleus, the female pronucleus. Heads of several sperm are stuck in the zona pellucida. **C.** Male and female pronuclei. **D,E.** Chromosomes become arranged on the spindle, split longitudinally, and move to opposite poles. **F.** Two-cell stage.



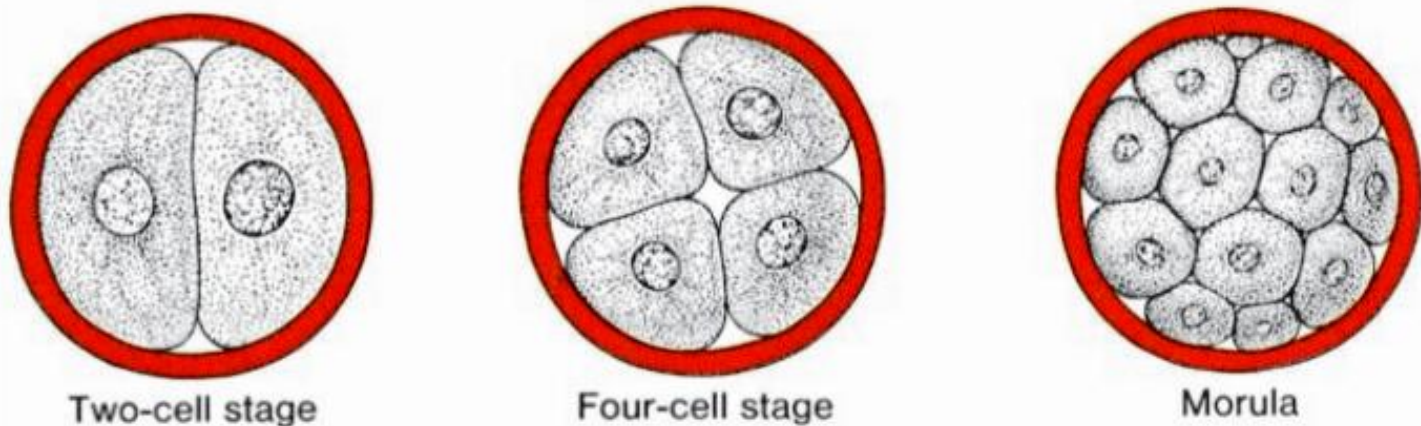
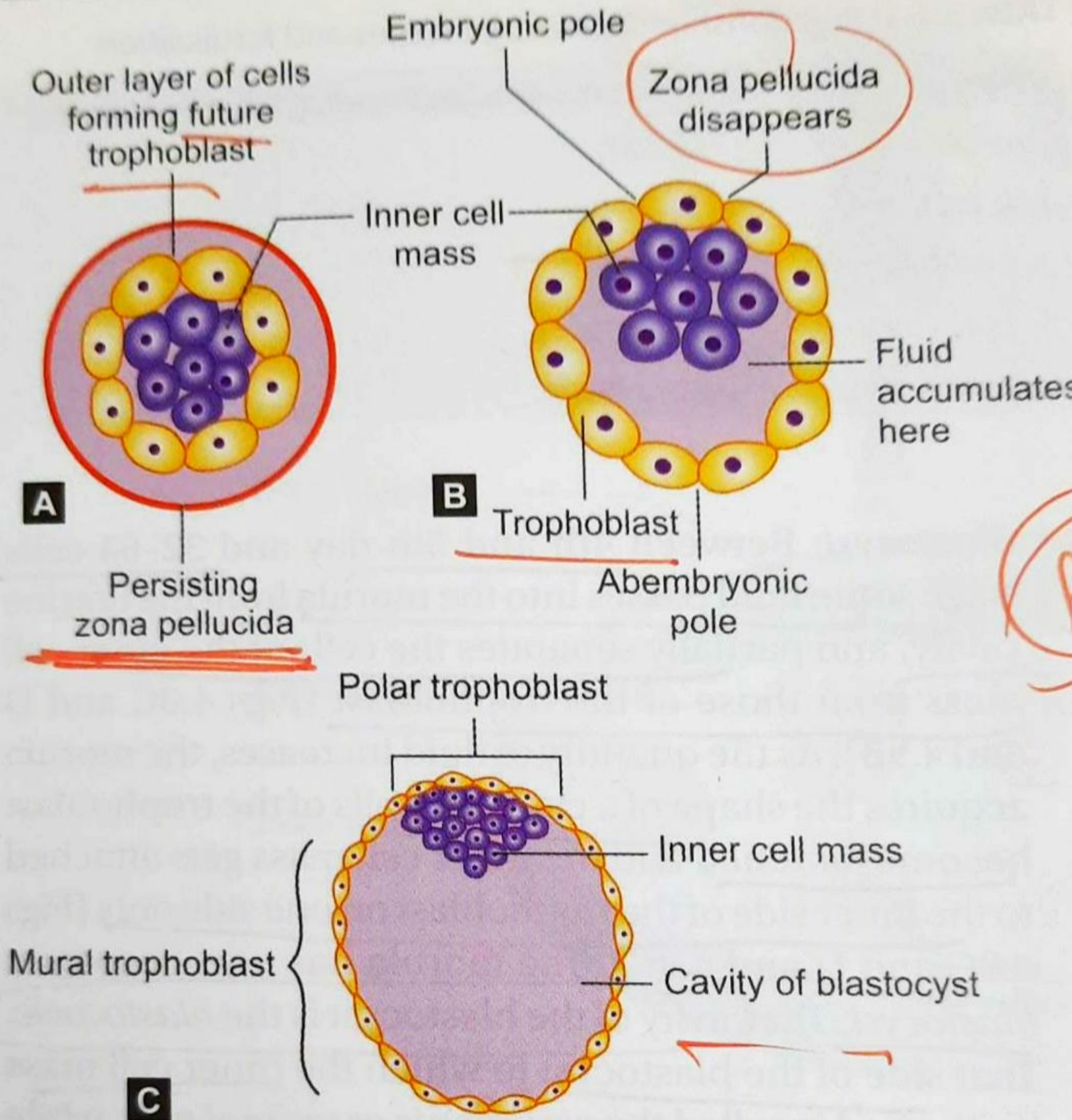


Figure 3.8 Development of the zygote from the two-cell stage to the late morula stage. The two-cell stage is reached approximately 30 hours after fertilization; the four-cell stage is reached at approximately 40 hours; the 12- to 16-cell stage is reached at approximately 3 days; and the late morula stage is reached at approximately 4 days. During this period, blastomeres are surrounded by the zona pellucida, which disappears at the end of the fourth day.



Figs 4.9A to C: Formation of blastocyst

Hatching of blastocyst: Thinning of zonal pellucida starts on 4th day and it disappears on 5th day of fertilization (Fig. 4.8D). Disappearance of zona pellucida initiates attachment of trophoblastic cells to uterine epithelium known as implantation on 6th or 7th day after fertilization.

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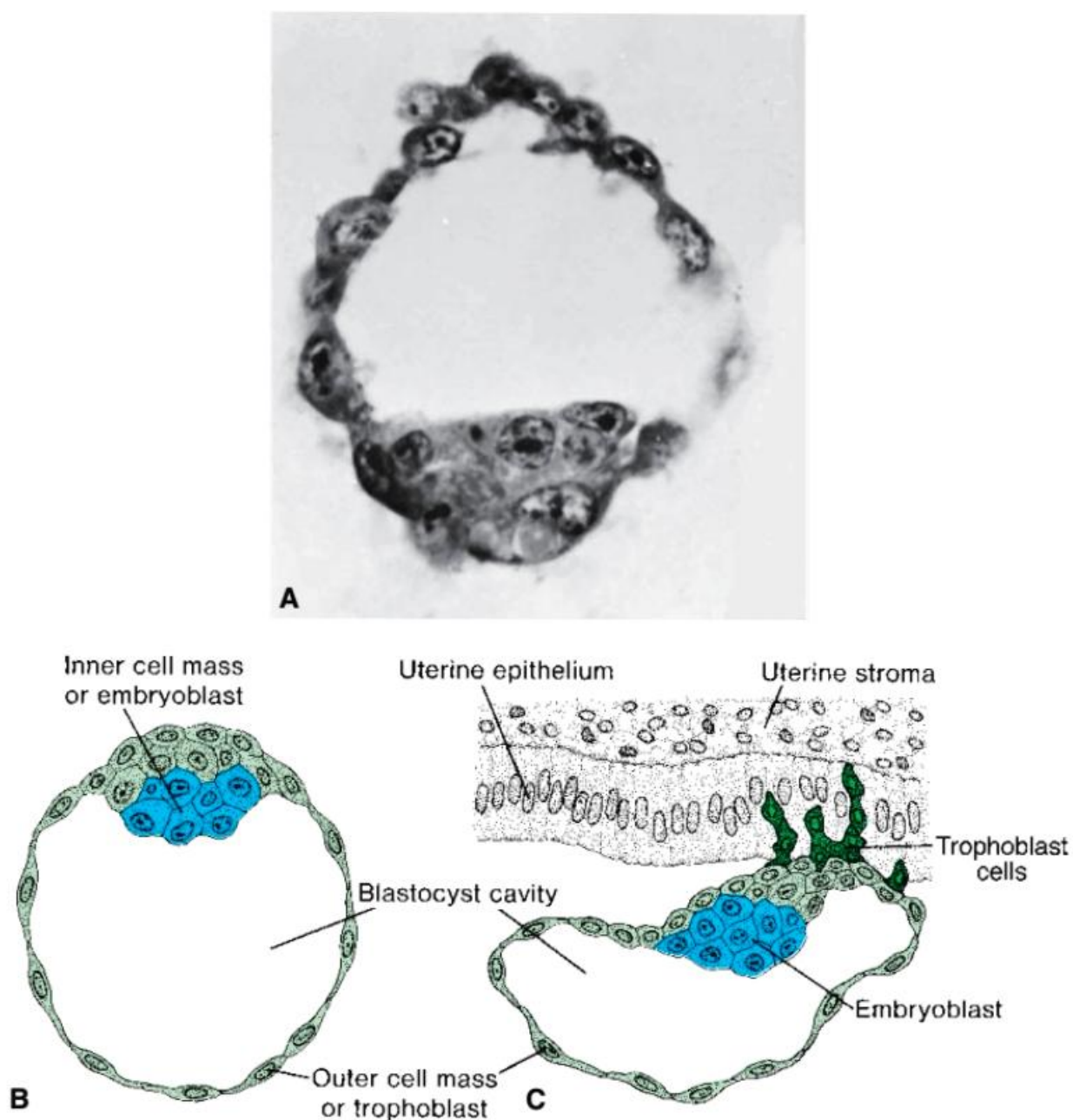


Figure 3.10 **A.** Section of a 107-cell human blastocyst showing inner cell mass and trophoblast cells. **B.** Schematic representation of a human blastocyst recovered from the uterine cavity at approximately 4.5 days. Blue, inner cell mass or embryoblast; green, trophoblast. **C.** Schematic representation of a blastocyst at the sixth day of development showing trophoblast cells at the embryonic pole of the blastocyst penetrating the uterine mucosa. The human blastocyst begins to penetrate the uterine mucosa by the sixth day of development.