Amazingly, out of every 100 eggs that are exposed to sperm, only 94 are fertilized, only 69 are implanted, only 42 survive one week and only 31 survive to birth. No wonder it's called the 'miracle of life.'

EMBRYOLOGY

The science that deals with the development of the organism from the zygote to the completion of its bodily structures.
Human development before implantation

Figure 51.10

1. Ovulation
2. Fertilization
3. Cleavage
4. Morula
5. Early blastocyst
6. Late blastocyst
7. Implantation

- 2-cell stage
- 4-cell stage
- 8-cell stage
- zona pellucida
- sperm cell nucleus
- 1st and 2nd polar bodies
- egg cell nucleus
- oviduct
- fimbriae
- secondary oocyte
- follicular cell
- blastocyst cavity
- trophoblast
- inner cell mass
cleavage

morphogenesis

Lancelet early development
Figure 51.2
Development of neural tube and coelom in frog embryo

Figure 51.4
Germ Layer Theory

Figure 20.16

Digestive tract

Skin

Spinal cord

Chorion

Tail end

Body stalk with umbilical vessels

Trophoblast

Yolk sac

Brain

Heart

Amniotic fluid

Amnion

Endoderm

Ectoderm

Mesoderm

Vertebrate
dorsal muscles
skeletal sys.
circulatory sys.
reproductive
kidneys
lining of coelom
lining of digestive tract
lungs, liver, pancreas
glands
urinary bladder


Chick
- chorion
- amnion
- embryo
- allantois
- yolk sac
- fetal portion of placenta
- maternal portion of placenta

Human
- umbilical cord
45–56 Day of Development (6-8 wks.)

a. 45 ± 1 day 22–24 mm
b. 49 ± 1 day 28–30 mm
c. 52 ± 1 day 32–34 mm
d. 56 ± 1 day 34–40 mm
Human embryo at beginning of fifth week

Figure 51.12b
Anatomy of the placenta in a fetus at 6–7 months

Figure 51.13

- amniotic fluid
- umbilical cord
- placenta
- uterine wall
- chorionic villi
- maternal blood vessels
- umbilical blood vessel
- Placenta