

# PERKEMBANGAN BIOLOGIS

(Sesi 4, 5, 6)

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Oleh

Yuyus Suherman

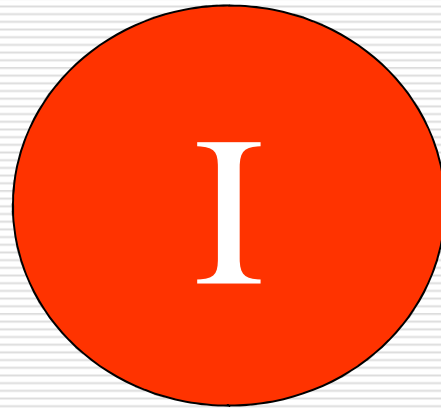
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# Tujuan dan Hasil Belajar

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**Setelah mengikuti sesi ini diharapkan mahasiswa dapat:**

- ❖ Menjelaskan kembali pengertian proses biologis (Biological processes)
  - ❖ Menjelaskan kembali pengaruh faktor genetika terhadap perkembangan individu
  - ❖ Menjelaskan kembali interaksi faktor bawaan-lingkungan dan perkembangan
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# INTRODUCTION

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# Introduction

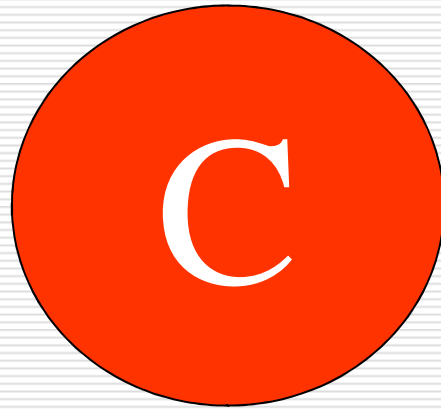
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- ❖ Proses biologis (*biological processes*) mencakup perubahan-perubahan dalam hakikat fisik individu. Gen yang diwariskan dari orang tua, perkembangan otak, pertambahan tinggi dan berat badan, ketrampilan motorik, dan perubahan hormonal (khusus pada masa remaja).
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Pengaruh faktor genetika tetap penting bahkan sampai 10 atau 20 tahun sesudah masa pembuahan berlalu. Pada spesies apapun, pasti terdapat mekanisme untuk mewariskan karakteristik bawaan dari satu generasi ke generasi berikutnya. Setiap individu membawa kode genetik yang diwarisi dari orang tuanya. Kode-kode genetik individu serupa dalam hal penting, yaitu semua manusia mengandung kode genetik manusia. Karena kode genetik manusia inilah, sel telur manusia yang dibuahi tidak akan tumbuh menjadi seekor belut, harimau, gajah dan sebagainya.

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**CONNECTION**

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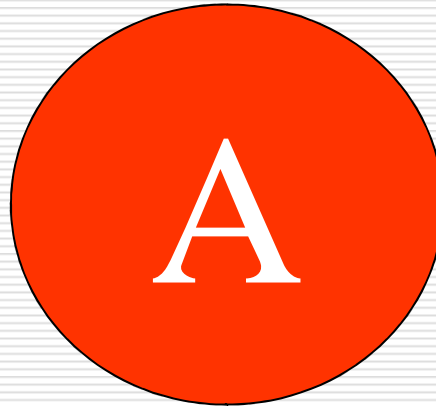
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## □ Sifat Dasar Gen

Setiap manusia memulai hidupnya sebagai sel tunggal berbobot 1/20 juta ons. Zat sekecil itu mewadahi seluruh kode genetik kita, informasi mengenai akan jadi dari berbentuk sel tunggal sampai menjadi anak yang terbentuk dari trilyunan sel, yang setiap selnya mengandung reflika sempurna dari kode genetik asalnya.

Secara fisik, kode warisan tersebut dibawa oleh agen biokimia yang bernama gen dan kromosom. Selain menghasilkan kesamaan fisik yang jelas diantar individu, seperti jaringan dalam, struktur otak dan organ tubuh, kode genetik tersebut juga menyebabkan adanya kesamaan psikologis diantara individu (keuniversalan)

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**APPLICATION**

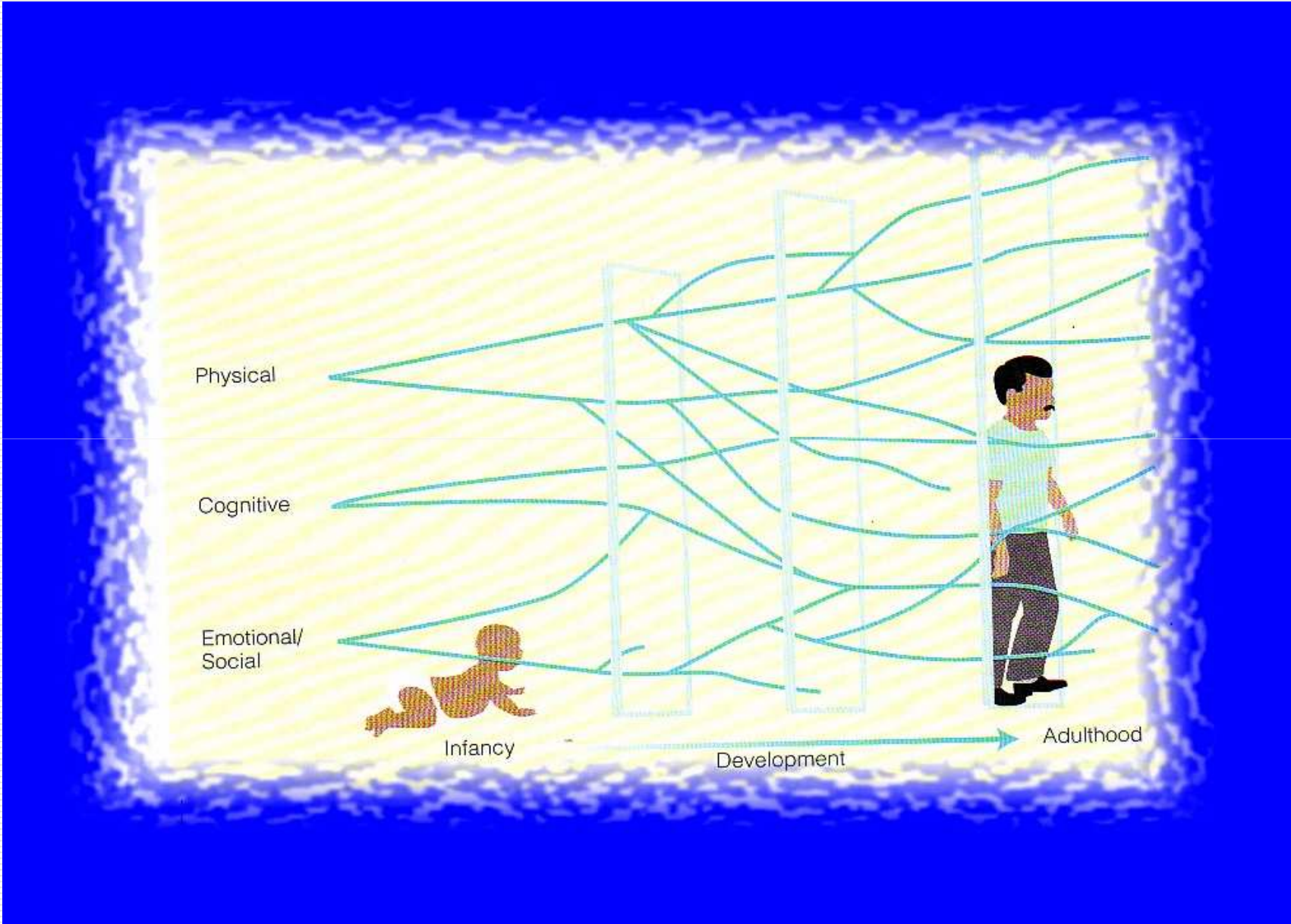
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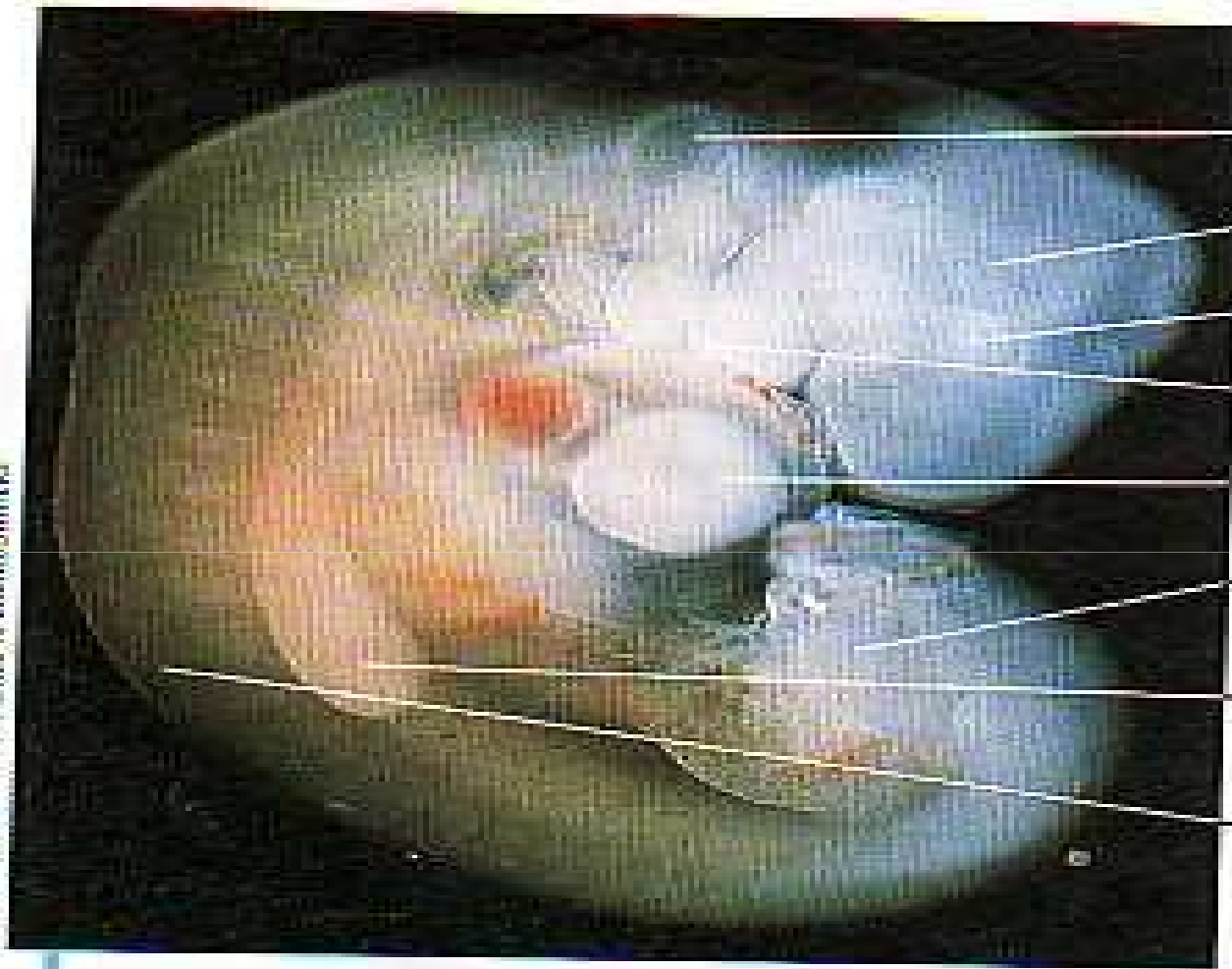


10'

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- Silahkan berkelompok, nikmati handout 2.1:
  - Presentasi hasil diskusi anda
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Beginning of ears

Brain

Will become eyes

Will become the jaw

Heart

Lower limb buds will become legs

Upper limb buds will become arms

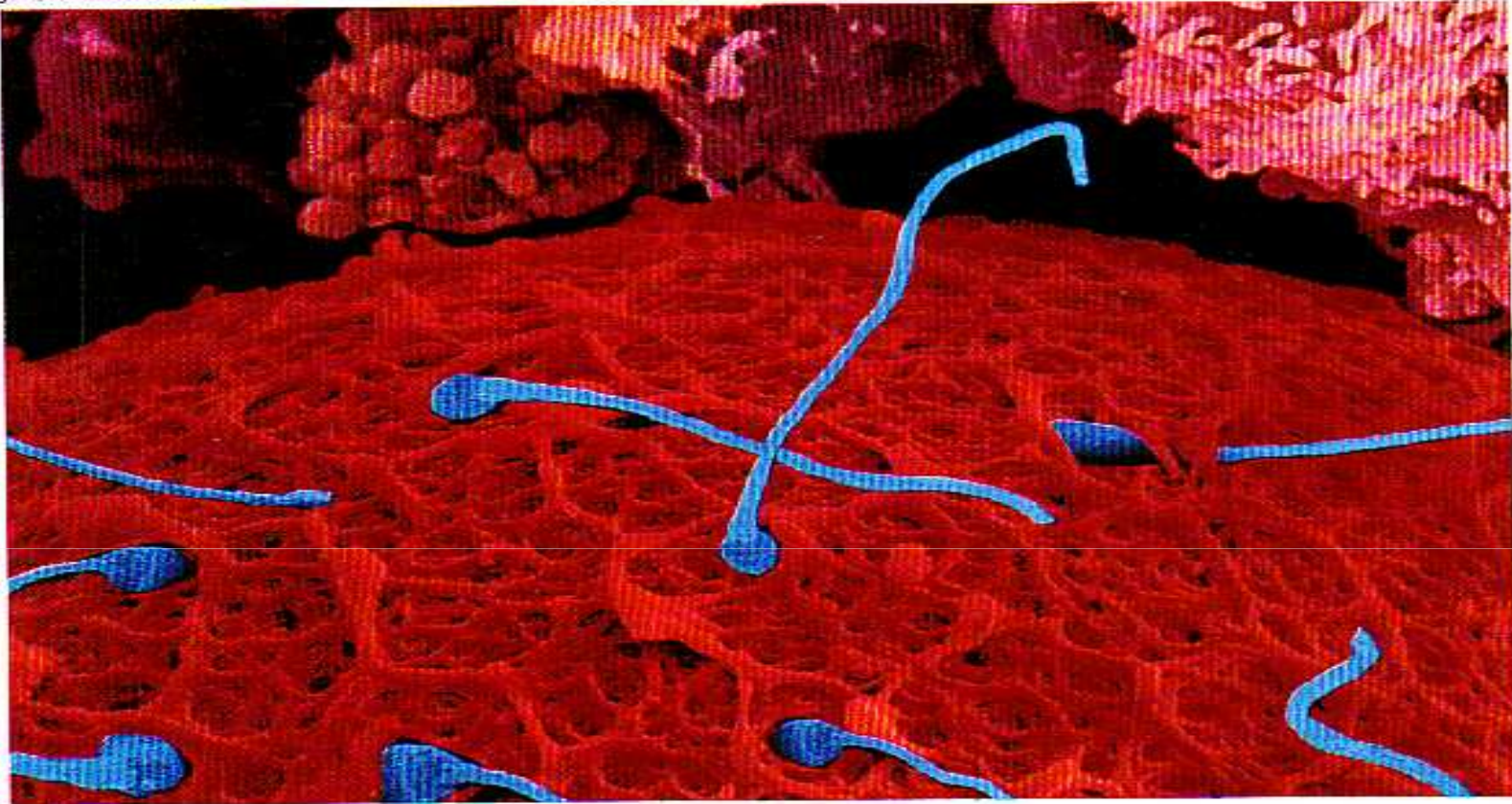
Beginning of muscles and backbone

**Period of the embryo: fourth week.** In actual size, this 4-week-old embryo is only  $\frac{1}{4}$  inch long, but many body structures have begun to form.



**Period of the embryo: seventh week.** The embryo's posture is more upright. Body structures—eyes, nose, arms, legs, and internal organs—are more distinct. An embryo of this age responds to touch. It also can move, although at less than one inch long and an ounce in weight, it is still too tiny to be felt by the mother.

JACK BURNS/ACE/PHOTOTAKE



In this photo taken with the aid of a powerful microscope, sperm have completed their journey up the female reproductive tract and are beginning to penetrate the surface of the enormous-looking ovum, the largest cell in the human body. When one of the sperm is successful at fertilizing the ovum, the resulting zygote will begin to duplicate.

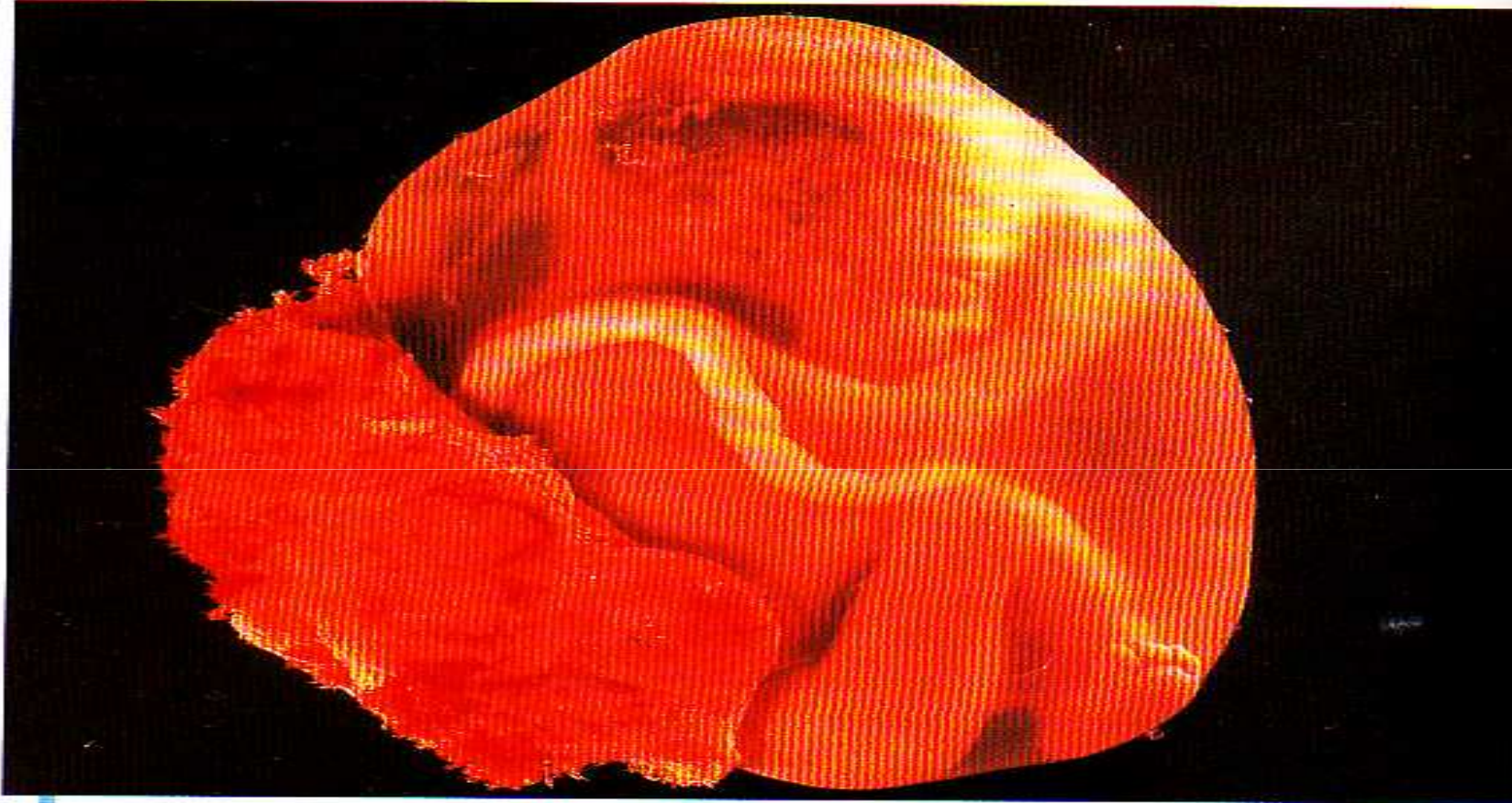
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### Period of the fetus: eleventh

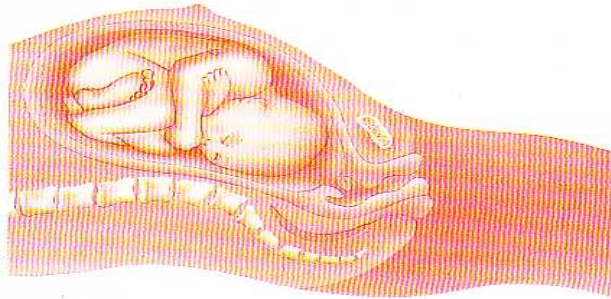
**week.** The organism increases rapidly in size, and body structures are completed. At 11 weeks, the brain and muscles are better connected. The fetus can kick, bend its arms, open and close its hands and mouth, and suck its thumb. Notice the yolk sac, which shrinks as pregnancy advances. The internal organs have taken over its function of producing blood cells.

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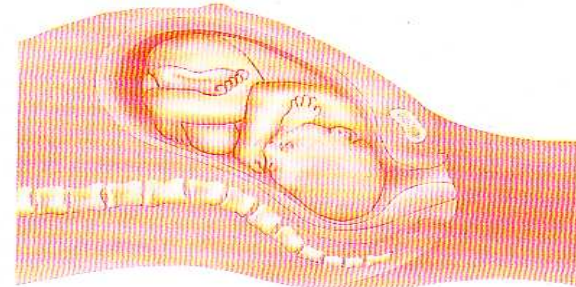


**Period of the fetus: thirty-sixth week.** This fetus fills the uterus. To support its need for nourishment, the umbilical cord and placenta have grown large. Notice the vernix (cheeselike substance) on the skin, which protects it from chapping. The fetus has accumulated a layer of fat to assist with temperature regulation after birth. In 2 more weeks, it would be full term.

Stage 1

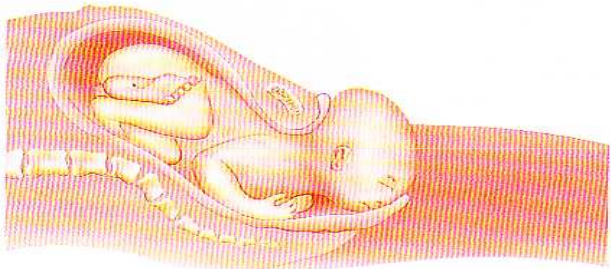


(a) Dilation and Effacement of the Cervix

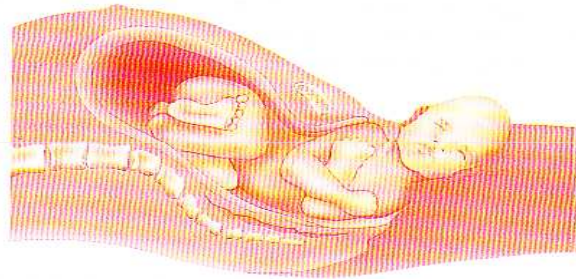


(b) Transition

Stage 2

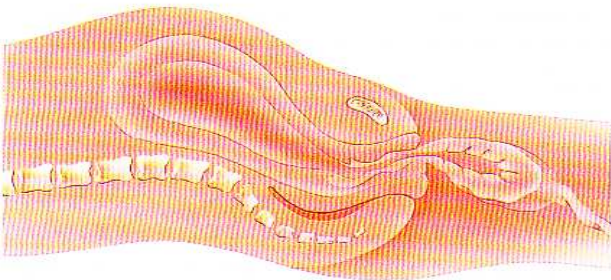


(c) Pushing



(d) Birth of the Baby

Stage 3

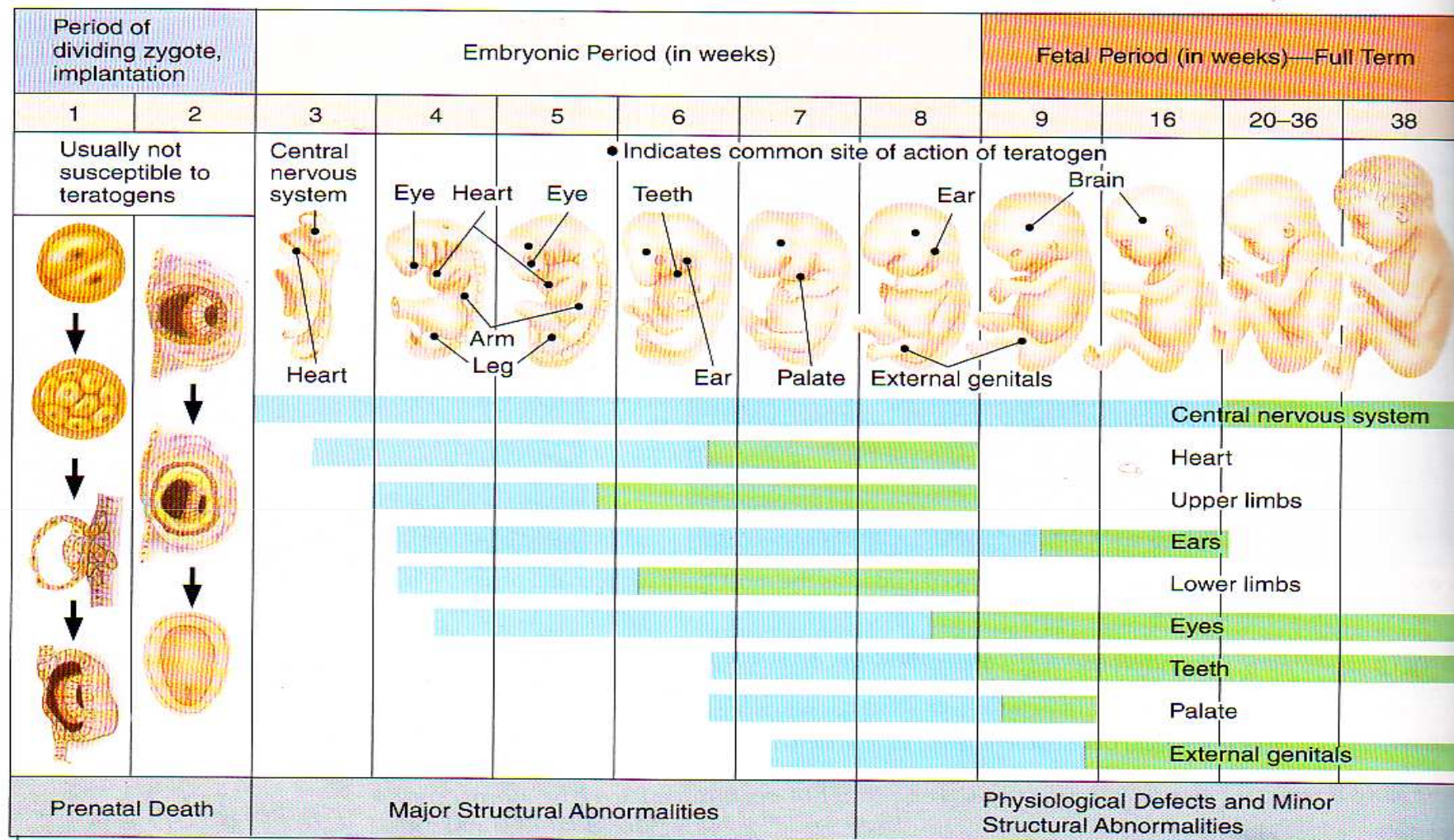


(e) Delivery of the Placenta

**FIGURE 3.11**

**The three stages of labor.** Stage 1: (a) Contractions of the uterus cause the cervix to open and thin. (b) Transition is reached when the frequency and strength of the contractions are at their peak and the cervix opens completely. Stage 2: (c) The mother pushes with each contraction, forcing the baby down the birth canal, and the head appears. (d) Near the end of Stage 2, the shoulders emerge and are followed quickly by the rest of the baby's body. Stage 3: (e) With a few final pushes, the placenta is delivered.

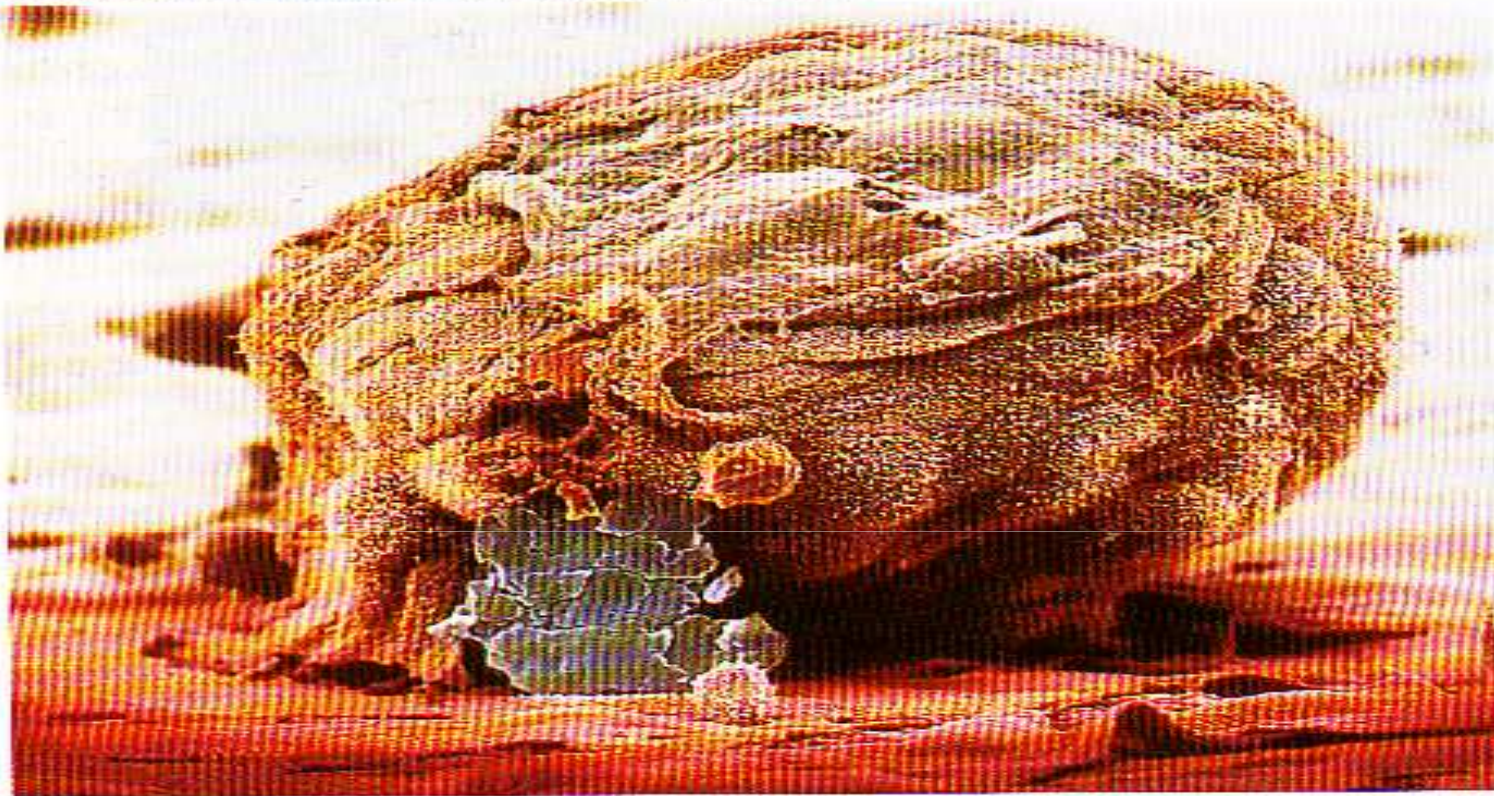




**FIGURE 3.8**

**Sensitive periods in prenatal development.** Each organ or structure has a sensitive period, during which its development may be disturbed. Blue horizontal bars indicate highly sensitive periods. Green horizontal bars indicate periods that are somewhat less sensitive to teratogens, although damage can occur. (From K. L. Moore & T. V. N. Persaud, 1998, *Before We Are Born*, 5th ed., Philadelphia: Saunders, p. 166. Reprinted by permission of the publisher and the author.)

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**Period of the zygote: seventh to ninth day.** The fertilized ovum duplicates at an increasingly rapid rate, forming a hollow ball of cells, or blastocyst, by the fourth day after fertilization. Here the blastocyst, magnified thousands of times, burrows into the uterine lining between the seventh and ninth day.

Carrier Father



Carrier Mother



Normal



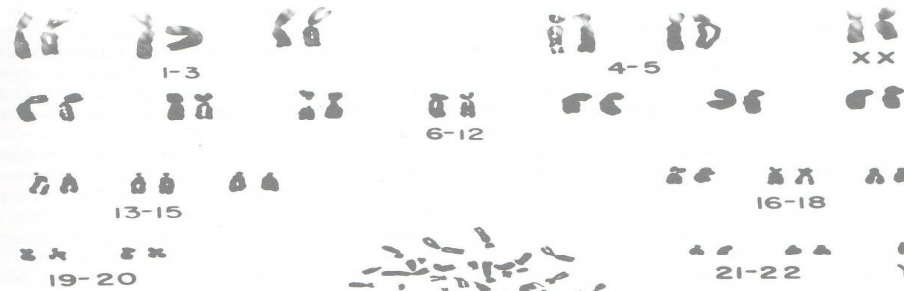
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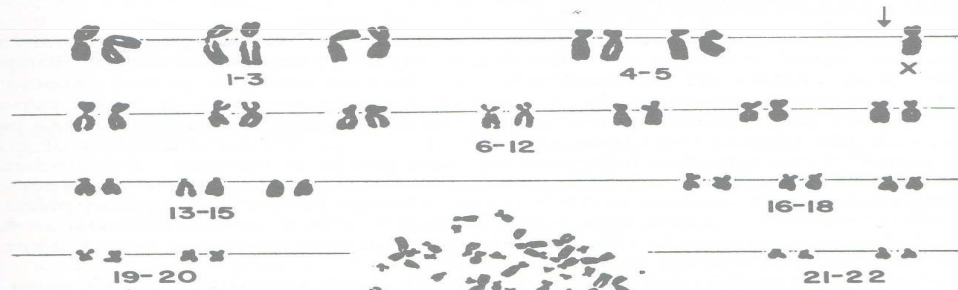
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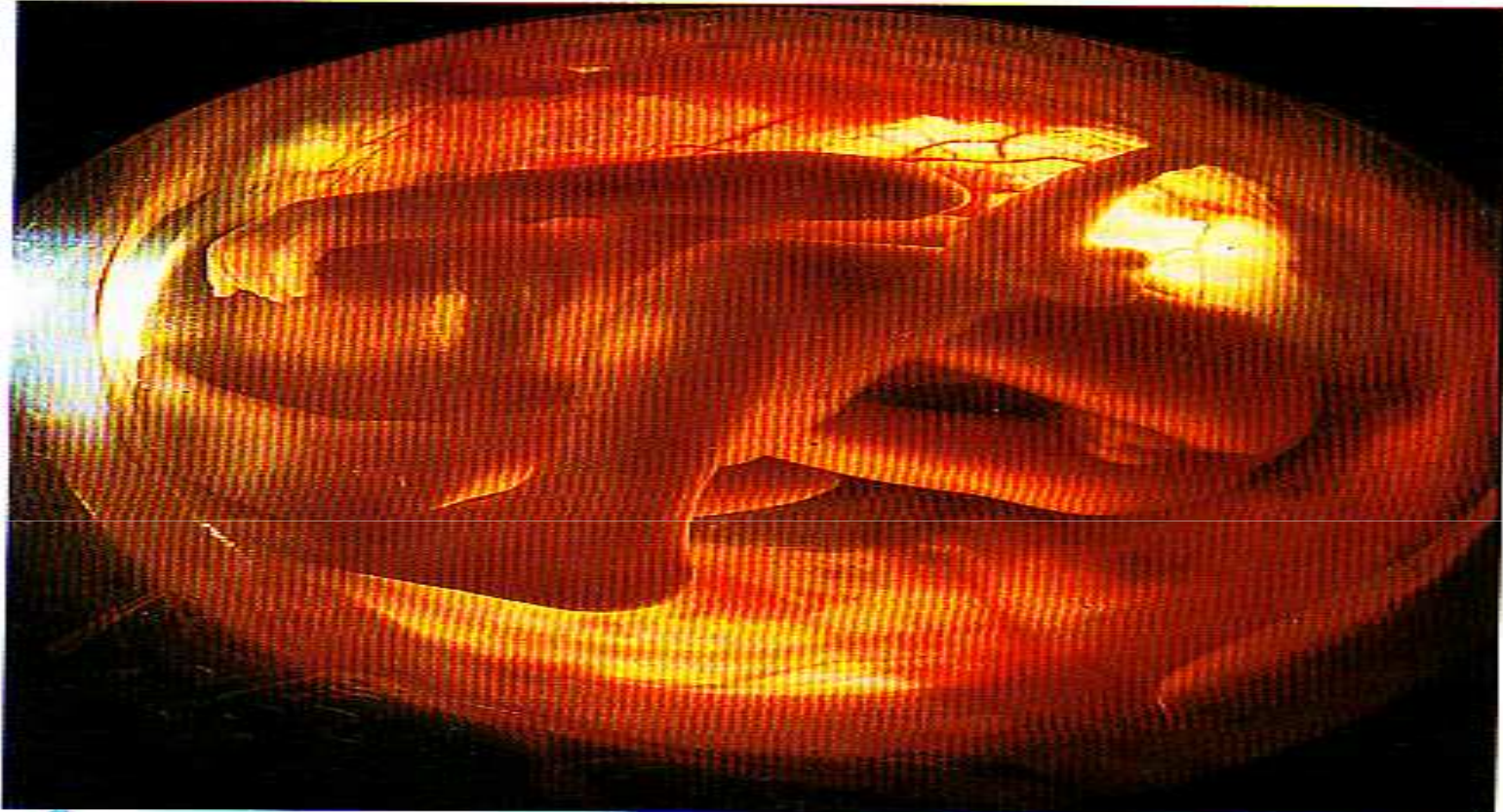
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KLINFELTER SYNDROME

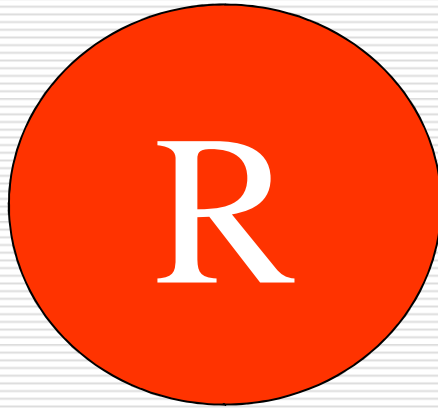


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**Period of the fetus: twenty-second week.** This fetus is almost a foot long and weighs slightly more than a pound. Its movements can be felt easily by the mother and other family members who place a hand on her abdomen. The fetus has reached the age of viability: if born, it has a slim chance of surviving.

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- ❑ Silahkan berkelompok.
  - ❑ Kerjakan Handout 9.2:
  - ❑ Presentasikan hasil diskusi kelompok anda.
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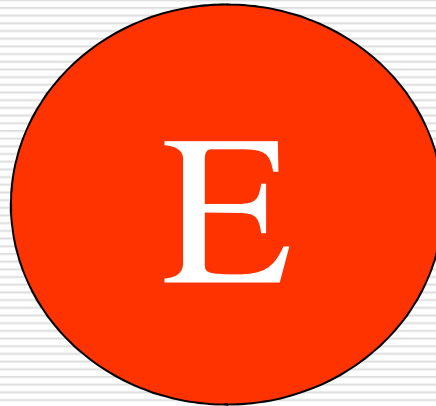
**REFLECTION**

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# Reflection

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- Apakah sesi ini sudah bisa mencapai tujuan-tujuan tersebut?
  - Anda diharapkan untuk menuliskan hasil belajar dari sesi ini.
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**EXTENSION**

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# Extension

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- ❑ Mendisain media pelatihan yang akan digunakan dalam micro facilitating.
  - ❑ Pelajari semua informasi tambahan yang disediakan.
  - ❑ Mahasiswa diharapkan Mengakses informasi yang tersedia di situs-situs yang disediakan.
-

A close-up photograph of several white calla lilies. The flowers are in various stages of bloom, with some showing the characteristic hooded shape and others more open. The petals are a soft, creamy white. In the background, there are large, vibrant green leaves with prominent veins. The overall composition is clean and elegant, typical of a floral arrangement.

**Terima kasih**