HANDOUT # 5

THIRD MONTH TO BIRTH

“FETAL PERIOD”

Anatomy Department
R.A. FADEL
THIRD MONTH TO BIRTH
FETAL PERIOD

The fetal period extends from the third month (9\textsuperscript{th} week of development) to birth. It is characterized by the rapid growth of the body and maturation of organs. The \textit{weight} of the fetus increases from 30 gm at the beginning of this period to reach about 3 kg at the full-term. The \textit{length} (Crown-heel) of the fetus is about 50 cm at birth. The \textit{sex} of the fetus could be determined from the third month due to the appearance of external genitalia. The \textit{movement} of the fetus could be felt by the mother from the fourth month. The \textit{fetal heart beat} is heard through the stethoscope from the beginning of the fifth month (after the 16\textsuperscript{th} week). The \textit{fetus could live} if he was born after 24 weeks of development.

The \textit{length of pregnancy} for a full-term fetus is considered to be 280 days or 40 weeks after the onset of the last menstrual period. However, the \textit{age of a full-term fetus} is considered to be 266 days or 38 weeks after fertilization (2 weeks less than length of pregnancy).

\textbf{Methods of estimation of the embryonic and fetal ages}

Embryonic and fetal ages could be estimated by using the ultrasound. The most common measurements are the crown rump length (sitting height), crown heel length (standing height), and head measurements like head circumference and biparietal diameter (see tables). Remarks:

1- Note that the size of the head constitutes:
\begin{itemize}
  \item a- 1/2 of the fetal length at the 3\textsuperscript{rd} month
  \item b- 1/3 of the fetal length at the 5\textsuperscript{th} month
  \item c- 1/4 of the fetal length at birth.
\end{itemize}

2- The age of the embryo could be estimated by counting the number of somites of the embryos using the dissecting microscope (performed usually in experimental embryological studies).
### TABLE 5.2 Number of Somites Correlated to Approximate Age in Days

<table>
<thead>
<tr>
<th>Approximate Age (days)</th>
<th>No. of Somites</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>1–4</td>
</tr>
<tr>
<td>21</td>
<td>4–7</td>
</tr>
<tr>
<td>22</td>
<td>7–10</td>
</tr>
<tr>
<td>23</td>
<td>10–13</td>
</tr>
<tr>
<td>24</td>
<td>13–17</td>
</tr>
<tr>
<td>25</td>
<td>17–20</td>
</tr>
<tr>
<td>26</td>
<td>20–23</td>
</tr>
<tr>
<td>27</td>
<td>23–26</td>
</tr>
<tr>
<td>28</td>
<td>26–29</td>
</tr>
<tr>
<td>30</td>
<td>34–35</td>
</tr>
</tbody>
</table>

![Image of a fetal period with labeled structures:]

- 1st pharyngeal groove (left)
- 1st, 2nd, and 3rd pharyngeal (branchial) arches
- Cervical sinus
- Heart prominence
- Upper limb bud
- Neural tube
- Somites
- Mesonephric ridge

Actual size 4.0 mm.
### TABLE 5.3 Crown-Rump Length Correlated to Approximate Age in Weeks

<table>
<thead>
<tr>
<th>CRL (mm)</th>
<th>Approximate Age (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-8</td>
<td>5</td>
</tr>
<tr>
<td>10-14</td>
<td>6</td>
</tr>
<tr>
<td>17-22</td>
<td>7</td>
</tr>
<tr>
<td>28-30</td>
<td>8</td>
</tr>
</tbody>
</table>

---

A. 3rd month  
B. 5th month  
C. At birth
**Congenital anomalies**

Many factors may interact with the differentiating and growing of the embryo. This interaction may lead to death, congenital anomalies or fetal growth restriction. The factors could be environmental (e.g. drugs and viruses), genetic (chromosome abnormalities) or both. Agents which are introduced during pregnancy and produce congenital anomalies are known as *Teratogens* (like alcohol, drugs, virus....). The most sensitive period for teratogenesis is the *embryonic period* where various structures are first formed and differentiated.
Twins

Twinning means the simultaneous births of two fetuses by one mother. These twins may be monozygotic (identical twins) or dizygotic (fraternal, non-identical twins)

**Dizygotic twins (2/3 of twins)**
It results from fertilization of two ova by different sperms. They are non-identical twins (unlike twins) that may have same or different sexes and have different blood groups. They always have two amnions, two chorions and two placentaes (figure A) but the chorions and placentaes may fuse (Figure B).
Monozygotic twins (1/3 of twins)
It results from a single fertilized ovum. The twins are identical having the same sex and blood group and resemble each other physically.
A- If separation occurs at the two cell stage, the resulting embryos will have a complete separate chorionic sacs, amniotic cavities and placentae.
B- If separation occurs at the blastocyst stage, the inner cell mass will divide into two complete separate embryonic groups. The two embryos will have common chorionic sac and common placenta and two separate amniotic cavities (the most common).
C- If separation of inner cell mass is incomplete the embryos will share the same amniotic cavity (rare)