

DVD Outline PDF Example

Chapter 9 – 2 to 4 Weeks: Germ Layers and Organ Formation

A. Organ Formation [1]

1. Brain [1]

- i. By 3 weeks the brain is dividing into 3 primary sections called the forebrain, midbrain, and hindbrain [1]

Chapter 13 – Brain Growth

- A. Rapid brain growth is evidenced by the changing appearance of the forebrain, midbrain, and hindbrain

Chapter 15 – 5 Weeks: Cerebral Hemispheres

- A. Between 4 and 5 weeks, the brain continues its rapid growth and divides into 5 distinct sections [2]

- B. The cerebral hemispheres appear, gradually becoming the largest parts of the brain [3]

- C. Functions eventually controlled by the cerebral hemispheres [4]

1. Thought [4]

2. Learning [4]

3. Memory [4]

4. Speech [4]

5. Vision [4]

6. Hearing [4]

7. Problem-solving [4]

Chapter 20 – 6 Weeks: Motion and Sensation

- A. By 6 weeks the cerebral hemispheres are growing disproportionately faster than other sections of the brain

Chapter 23 – Hand Plates and Brainwaves

- A. Brainwaves [5]

1. Have been recorded as early as 6 weeks and 2 days [5]

Chapter 30 – 8 Weeks: Brain Development

- A. At 8 weeks the brain is highly developed [6]

- B. At 8 weeks the brain constitutes almost half of the embryo [6]

Chapter 31 – Right- and Left-Handedness

- A. By 8 weeks, 75% of embryos exhibit right-hand dominance [7]

- B. 25% of embryos are equally divided between left-handed dominance and no preference [7]

- C. This is the earliest evidence of right- or left-handed behavior [7]

Chapter 41 – 4 to 5 Months (16 to 20 Weeks): Stress Response, Vernix Caseosa, Circadian Rhythms

- A. Circadian rhythms [8]

1. From 19 weeks; fetal movement, breathing activity, and heart rate begin to follow daily cycles called circadian rhythms [8]

Chapter 43 – 6 to 7 Months (24 to 28 Weeks): Blink-Startle; Pupils Respond to Light; Smell and Taste

- A. Brain growth [9]

1. During the third trimester of pregnancy, brain weight increases between 400 and 500% [9]
2. Rapid brain growth consumes more than 50% of the energy used by the fetus [9]

Chapter 44 – 7 to 8 Months (28 to 32 Weeks): Sound Discrimination, Behavioral States

A. Behavioral states [10]

1. The fetus displays periods of coordinated activity punctuated by periods of rest during the last 4 months of pregnancy [10]
2. Reflect the ever-increasing complexity of the central nervous system [10]

Footnotes

¹Bartelmez, 1923; O'Rahilly and Müller, 1999a; O'Rahilly and Müller, 1987; O'Rahilly and Müller, 1984; O'Rahilly and Gardner, 1979; Müller and O'Rahilly, 1983.

²O'Rahilly and Müller, 1999a; Sadler, 2005.

³O'Rahilly and Müller, 1987; Bartelmez and Dekaban, 1962; Moore, 1980; van Dongen and Goudie, 1980; O'Rahilly and Müller, 1999a; O'Rahilly et al., 1984; O'Rahilly and Gardner, 1979; Campbell, 2004.

⁴Guyton and Hall, 2000.

⁵van Dongen and Goudie, 1980; O'Rahilly and Müller, 1999a; ; Hamlin, 1964; Bernstine et al., 1955; Borkowski and Bernstine, 1955.

⁶Jordaan, 1979; O'Rahilly and Müller, 1999a.

⁷Hepper et al., 1998; McCartney and Hepper, 1999.

⁸de Vries et al., 1987; Vitaterna et al., 2001; Rosenwasser, 2001; Romanini and Rizzo, 1995; Okai et al., 1992; Goodlin and Lowe, 1974.

⁹Growth of the human brain, 1975; Mancuso and Palla, 1996.

¹⁰DiPietro et al., 2002.

Bibliography

Bartelmez GW, Dekaban AS. 1962. The early development of the human brain. Contributions to Embryology. Carnegie Institution of Washington.

Bartelmez GW. 1923. The subdivisions of the neural folds in man. Journal of Comparative Neurology. 35(3):231-247.

Bernstine RL, Borkowski WJ, Price AH. 1955. Prenatal fetal electroencephalography. American Journal of Obstetrics and Gynecology. 70(3):623-30.

Borkowski WJ, Bernstine RL. 1955. Electroencephalography of the fetus. Neurology. 5(5):362-365.

Campbell S. 2004. Watch me grow: A unique 3-dimensional week-by-week look at your baby's behavior and development in the womb. New York: St. Martins.

de Vries JIP, Visser GHA, Mulder EJH, Prechtl HFR. 1987. Diurnal and other variations in fetal

- movement and heart rate patterns at 20-22 weeks. *Early Human Development*. 15(6):333-348.
- DiPietro JA, Costigan KA, Pressman EK. 2002. Fetal state concordance predicts infant state regulation. *Early Human Development*. 68(1):1-13.
- Goodlin RC, Lowe EW. 1974. Multiphasic fetal monitoring, a preliminary evaluation. *American Journal of Obstetrics and Gynecology*. 119(3):341-357.
- Growth of the human brain: Some further insights. 1975. *Nutrition Reviews*. 33(1):6-7.
- Guyton AC, Hall JE. 2000. *Textbook of medical physiology*. 10th ed. Philadelphia: W.B. Saunders.
- Hamlin H. 1964. Life or death by EEG. *Journal of the American Medical Association*. 190(2):112-114.
- Hepper PG, McCartney GR, Shannon EA. 1998. Lateralised behavior in first trimester human foetuses. *Neuropsychologia*. 36(6):531-534.
- Jordaan H. 1979. Development of the central nervous system in prenatal life. *Obstetrics & Gynecology*. 53(2):146-150.
- Müller F, O'Rahilly R. 1983. The first appearance of the major divisions of the human brain at stage 9. *Anatomy and Embryology*. 168(3):419-432.
- Mancuso S, Palla G. 1996. Intrauterine nutrition and development. *Advances in Contraception*. 12(4):285-291.
- McCartney G, Hepper P. 1999. Development of lateralized behavior in the human fetus from 12 to 27 weeks' gestation. *Developmental Medicine and Child Neurology*. 41(2):83-86.
- Moore KL. 1980. *Clinically oriented anatomy*. Baltimore: Williams & Wilkins.
- O'Rahilly R, Gardner E. 1979. The initial development of the human brain. *Acta Anatomica*. 104(2):123-133.
- O'Rahilly R, Müller F, Hutchins GM, Moore GW. 1984. Computer ranking of the sequence of appearance of 100 features of the brain and related structures in staged human embryos during the first 5 weeks of development. *American Journal of Anatomy*. 171(3):243-257.
- O'Rahilly R, Müller F. 1984. Chevalier Jackson lecture. Respiratory and alimentary relations in staged human embryos. New embryological data and congenital anomalies. *Annals of Otology, Rhinology, and Laryngology*. 93(5 Pt 1):421-429.
- O'Rahilly R, Müller F. 1987. *Developmental stages in human embryos*. Washington: Carnegie Institution.
- O'Rahilly R, Müller F. 1999a. *The embryonic human brain: an atlas of developmental stages*. 2nd ed. New York: Wiley-Liss.
- Okai T, Kozuma S, Shinozuka N, Kuwabara Y, Mizuno M. 1992. A study on the development of sleep-wakefulness cycle in the human fetus. *Early Human Development*. 29(1-3):391-396.
- Romanini C, Rizzo G. 1995. Fetal behaviour in normal and compromised fetuses. An overview. *Early Human Development*. 43(2):117-131.
- Rosenwasser AM. 2001. Alcohol, antidepressants, and circadian rhythms. *Alcohol Research & Health*. 25(2):126-135.
- Sadler TW. 2005. *Langman's essential embryology*. Philadelphia: Lippincott Williams & Wilkins.
- van Dongen LGR, Goudie EG. 1980. Fetal movement patterns in the first trimester of pregnancy. *British Journal of Obstetrics and Gynaecology*. 87(3):191-193.
- Vitaterna MH, Takahashi JS, Turek FW. 2001. Overview of circadian rhythms. *Alcohol Research &*

Health. 25(2):85-92.