Lecture - 2016 Course Introduction

Embryology (/embryology/index.php/Main_Page) - 1 Aug 2016 (/embryology/index.php/File:Facebook_16x16.png) (/embryology/index.php/File:Pinterest_16x16.png) (/embryology/index.php/File:Twitter_16x16.png) [Expand] Expand to Translate

Contents

Course Introduction

(/embryology/index.php/File:Mark_Hill.jpg)
Course coordinator

This first lecture will be a general introduction to the course and the subject of Embryology.

Firstly, an introduction to the course, its content, method of presentation, assessment and an opportunity to ask questions.

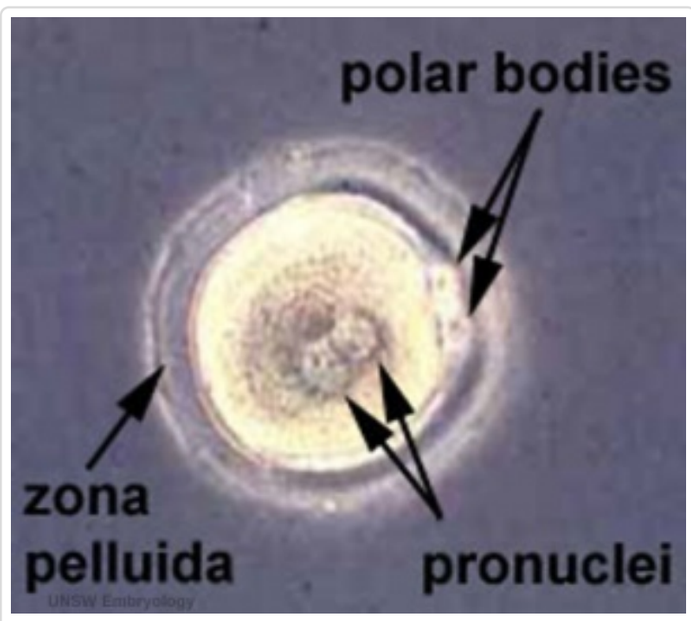
Secondly, some historic background to the subject and related current Australian trends. I do not expect you to remember specific historic dates or statistical data, this is provided as an introduction to the topic.

I like my lectures to be interactive, so ask me questions and I will also be asking you questions!

Lecture - Print PDF (/embryology/index.php?title=Special:Upload&wpDestFile=2016ANAT2341_Lecture_1_-_Course_Introduction.pdf)

Lecture Objectives

1. Understand the course objectives and assessment.
2. Brief understanding of the historic background of embryology.
3. Brief understanding of Australian data.
4. Broad overview of human development.



(/embryology/index.php/File:Early_zygote_label
Zygote (/embryology/index.php/Zygote) - the first cell formed after fertilisation. This early zygote still has the male and female pronuclei.

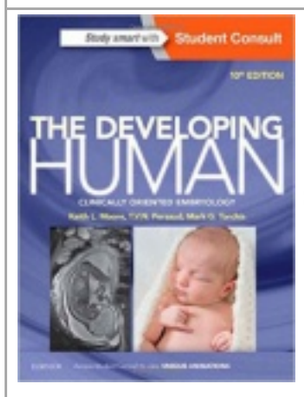
Here is the whole course in One Minute.

Introduction Movies [Expand]

Understand the Course

- 2016 Course Outline (/embryology/images/1/10/2016-ANAT2341-course-outline.pdf)
- Embryology Textbooks - UNSW (/embryology/index.php/Embryology_Textbooks_-_UNSW)

The Developing Human: Clinically Oriented Embryology (10th edn) [Collapse]



(/embryology/index.php/File:The_Developing_Human,_10th_edn.jpg)

UNSW Students have online access to the current 10th edn. through the UNSW Library subscription

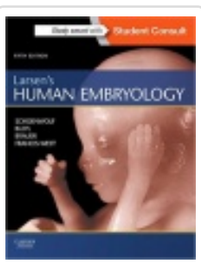
(http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/FullRecord.aspx?p=2074364).

APA Citation: Moore, K.L., Persaud, T.V.N. & Torchia, M.G. (2015). *The developing human: clinically oriented embryology* (10th ed.). Philadelphia: Saunders.

Links: UNSW Embryology Textbooks (/embryology/index.php/Embryology_Textbooks_-_UNSW) | Embryology Textbooks (/embryology/index.php/Embryology_Textbooks) | UNSW Library (http://www.library.unsw.edu.au)

1. Introduction to the Developing Human (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=23)
2. First Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=34)
3. Second Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=65)
4. Third Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=81)
5. Fourth to Eighth Weeks of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=104)
6. Fetal Period (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=132)
7. Placenta and Fetal Membranes (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=155)
8. Body Cavities and Diaphragm (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=198)
9. Pharyngeal Apparatus, Face, and Neck (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=216)
10. Respiratory System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=269)
11. Alimentary System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=286)
12. Urogenital System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=329)
13. Cardiovascular System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=381)
14. Skeletal System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=446)
15. Muscular System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=470)
16. Development of Limbs (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=480)
17. Nervous System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=500)
18. Development of Eyes and Ears (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=553)
19. Integumentary System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=578)
20. Human Birth Defects (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=603)
21. Common Signaling Pathways Used During Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=643)
22. Appendix : Discussion of Clinically Oriented Problems (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=659)

Larsen's Human Embryology (5th edn) **[Collapse]**



(/embryology/

UNSW students have full access to this textbook edition through UNSW Library subscription (http://er.library.unsw.edu.au/er/cgi-bin/eraccess.cgi?url=http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/FullRecord.aspx?p=2074524) (with student Zpass log-in).

APA Citation: Schoenwolf, G.C., Bleyl, S.B., Brauer, P.R., Francis-West, P.H. & Philippa H. (2015). *Larsen's human embryology* (5th ed.). New York; Edinburgh: Churchill Livingstone.

Links: UNSW Embryology Textbooks (/embryology/index.php/Embryology_Textbooks_-_UNSW) | Embryology Textbooks (/embryology/index.php/Embryology_Textbooks) | UNSW Library (http://www.library.unsw.edu.au)

1. Gametogenesis, Fertilization, and First Week (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=32)
2. Second Week: Becoming Bilaminar and Fully Implanting (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=61)
3. Third Week: Becoming Trilaminar and Establishing Body Axes (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=75)
4. Fourth Week: Forming the Embryo (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=100)
5. Principles and Mechanisms of Morphogenesis and Dysmorphogenesis (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=126)
6. Fetal Development and the Fetus as Patient (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=151)
7. Development of the Skin and Its Derivatives (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=173)
8. Development of the Musculoskeletal System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=190)
9. Development of the Central Nervous System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=215)
10. Development of the Peripheral Nervous System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=252)
11. Development of the Respiratory System and Body Cavities (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=269)
12. Development of the Heart (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=285)
13. Development of the Vasculature (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=322)
14. Development of the Gastrointestinal Tract (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=359)
15. Development of the Urinary System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=393)
16. Development of the Reproductive System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=412)
17. Development of the Pharyngeal Apparatus and Face (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=447)
18. Development of the Ears (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=491)
19. Development of the Eyes (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=506)
20. Development of the Limbs (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg=519)

ANAT2341Lectures - Textbook chapters

Lecture (Timetable (/embryology/index.php/ANAT2341_Course_Timetable_2016))	Textbook - The Developing Human (/embryology/index.php/Embryology_Textbooks_-_UNSW#The_Developing_Human:_Clinically_Oriented_Embryology)	Te (/embry _UI
Embryology Introduction (/embryology/index.php/Lecture_-_2015_Course_Introduction)	Introduction to the Developing Human (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=23)	
Fertilization (/embryology/index.php/Lecture_-_Fertilization)	First Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=34)	Gametogenesis, Ferti (http://www.unsw.ebli p=2074524&pg=32)
Week 1 and 2 (/embryology/index.php/Lecture_-_Week_1_and_2_Development)	Second Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=65)	Second Week: Becom (http://www.unsw.ebli p=2074524&pg=61)
Week 3 (/embryology/index.php/Lecture_-_Week_3_Development)	Third Week of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=81)	Third Week: Becomin (http://www.unsw.ebli p=2074524&pg=75)
Mesoderm (/embryology/index.php/Lecture_-	Fourth to Eighth Weeks of Human Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?	Fourth Week: Formin (http://www.unsw.ebli

_Mesoderm_Development)	p=2074364&pg=104)	p=2074524&pg=100)
Ectoderm (/embryology/index.php/Lecture_-_Ectoderm_Development)	Nervous System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=500)	Development of the C (http://www.unsw.ebli p=2074524&pg=215)
Early Vascular (/embryology/index.php/Lecture_-_Early_Vascular_Development)	Cardiovascular System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=381)	Development of the V (http://www.unsw.ebli p=2074524&pg=322)
Placenta (/embryology/index.php/Lecture_-_Placenta_Development)	Placenta and Fetal Membranes (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=155)	Development of the V (http://www.unsw.ebli p=2074524&pg=322)
Endoderm - GIT (/embryology/index.php/Lecture_-_Gastrointestinal_Development)	Alimentary System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=286)	Development of the G (http://www.unsw.ebli p=2074524&pg=359)
Respiratory (/embryology/index.php/Lecture_-_Respiratory_Development)	Respiratory System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=269)	Development of the R (http://www.unsw.ebli p=2074524&pg=269)
Head (/embryology/index.php/Lecture_-_Head_Development)	Pharyngeal Apparatus, Face, and Neck (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=216)	Development of the P (http://www.unsw.ebli p=2074524&pg=447)
Neural Crest (/embryology/index.php/Lecture_-_Neural_Crest_Development)	Nervous System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=500)	Development of the P (http://www.unsw.ebli p=2074524&pg=252)
Musculoskeletal (/embryology/index.php/Lecture_-_Musculoskeletal_Development)	Muscular System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=470)	Development of the M (http://www.unsw.ebli p=2074524&pg=190)
Limb (/embryology/index.php/Lecture_-_Limb_Development)	Development of Limbs (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=480)	Development of the L (http://www.unsw.ebli p=2074524&pg=519)
Renal (/embryology/index.php/Lecture_-_Renal_Development)	Urogenital System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=329)	Development of the U (http://www.unsw.ebli p=2074524&pg=393)
Genital (/embryology/index.php/Lecture_-_Genital_Development)	Urogenital System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=329)	Development of the U (http://www.unsw.ebli p=2074524&pg=393)
Stem Cells (/embryology/index.php/Lecture_-_Stem_Cells)		
Integumentary (/embryology/index.php/Lecture_-_Integumentary_Development)	Integumentary System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=578)	Development of the S (http://www.unsw.ebli p=2074524&pg=173)
Endocrine (/embryology/index.php/Lecture_-_Endocrine_Development)	Covered through various chapters (see also alternate text), read head and neck, neural crest and renal chapters.	**Endocrinology Text**
Heart (/embryology/index.php/Lecture_-_Heart_Development)	Cardiovascular System (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=381)	Development of the H (http://www.unsw.ebli p=2074524&pg=285)
Sensory (/embryology/index.php/Lecture_-_Sensory_Development)	Development of Eyes and Ears (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=553)	Development of the E (http://www.unsw.ebli p=2074524&pg=506)
Fetal (/embryology/index.php/Lecture_-_Fetal_Development)	Fetal Period (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=132)	Fetal Development an (http://www.unsw.ebli p=2074524&pg=151)
Birth and Revision (/embryology/index.php/Lecture_-_Birth)		

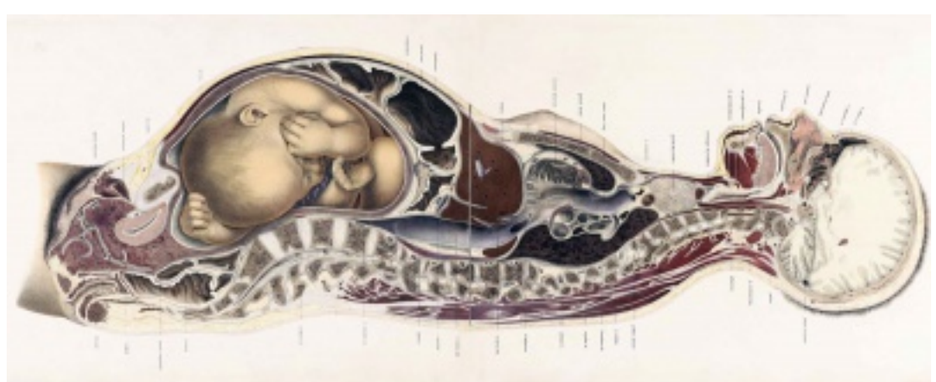
Additional Textbook Content - The following concepts also form part of the theory material covered throughout the course.

1. Principles and Mechanisms of Morphogenesis and Dysmorphogenesis (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074524&pg
2. Common Signaling Pathways Used During Development (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=643)
3. Human Birth Defect (http://www.unsw.eblib.com.wwwproxy0.library.unsw.edu.au/patron/Read.aspx?p=2074364&pg=603)

Science Student Projects (/embryology/index.php/Science_Student_Projects)

History

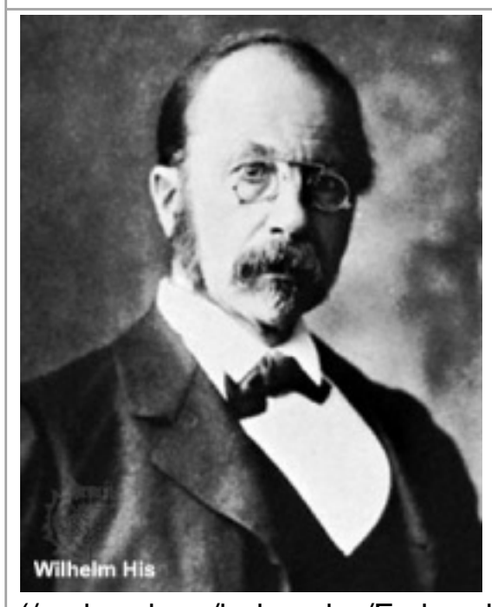
History - Embryologists (/embryology/index.php/History_-_Embryologists) | Embryology History (/embryology/index.php/Embryology_History) | Human Embryo Collections (/embryology/index.php/Human_Embryo_Collections)



(/embryology/index.php/File:BrauneB1.jpg)

17-18C (/embryology/index.php/Embryology_History_-_17th_and_18th_Century_Anatomies) Braune - The Position of the Uterus and Fetus at Term (1872)

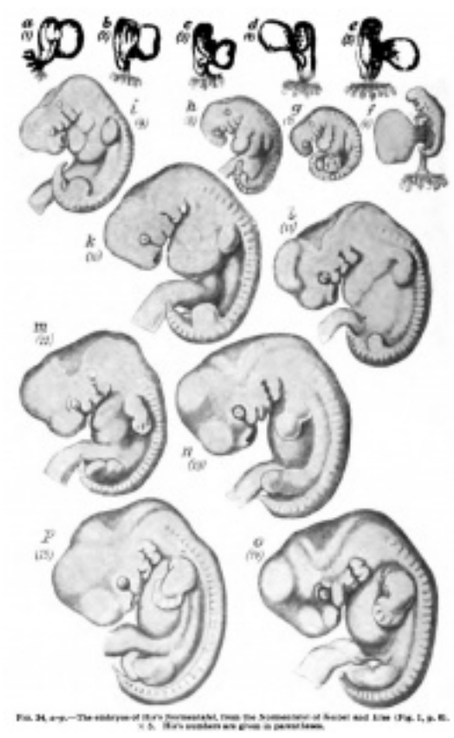
Human Embryo Collections (/embryology/index.php/Human_Embryo_Collections) **[Collapse]**



(/embryology/index.php/Embryology_History_-_Wilhelm_His)
Wilhelm His (/embryology/index.php/Embryology_History_-_Wilhelm_His) (1831-1904)

His's Normentafel (Normal Table)

Anatomie menschlicher Embryonen (/embryology/index.php/Book_-_Anatomy_Of_Human_Embryos) (1882)



(/embryology/index.php/File:Keibel_Mall_034a.jpg)

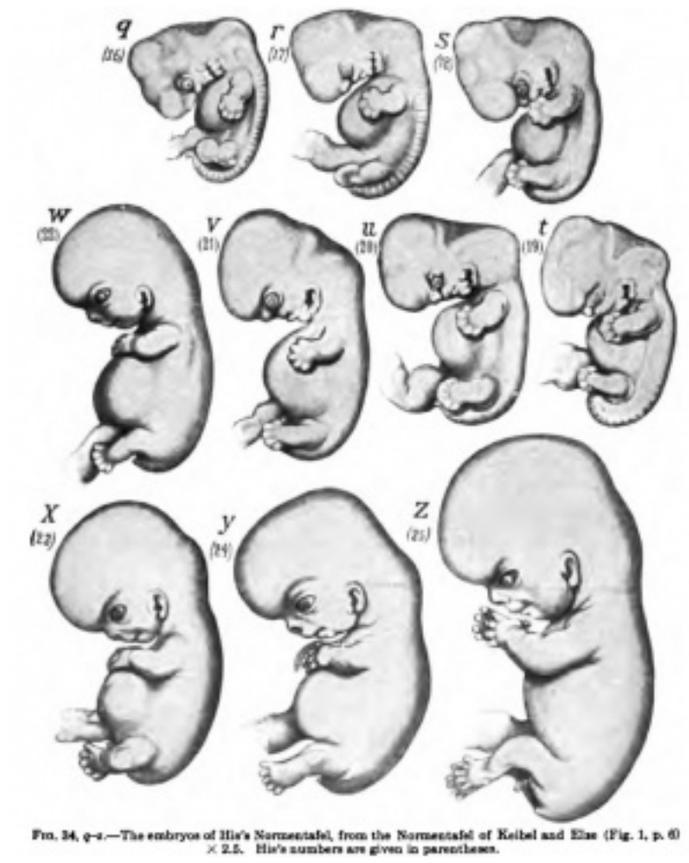
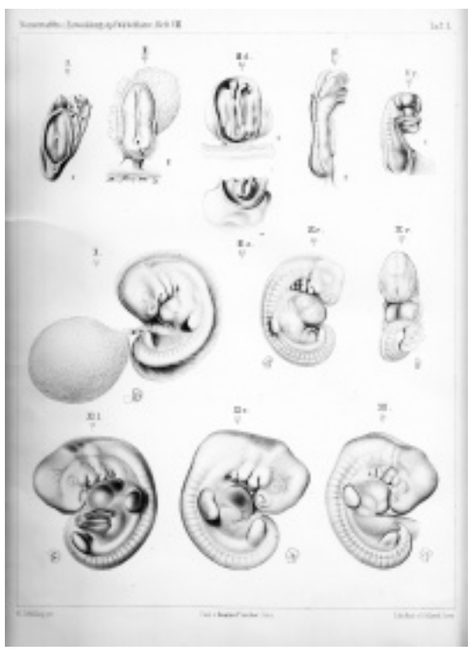


Fig. 34, q–z.—The embryos of His's Normentafel, from the Normentafel of Keibel and Elze (Fig. 1, p. 6) × 2.5. His's numbers are given in parentheses.

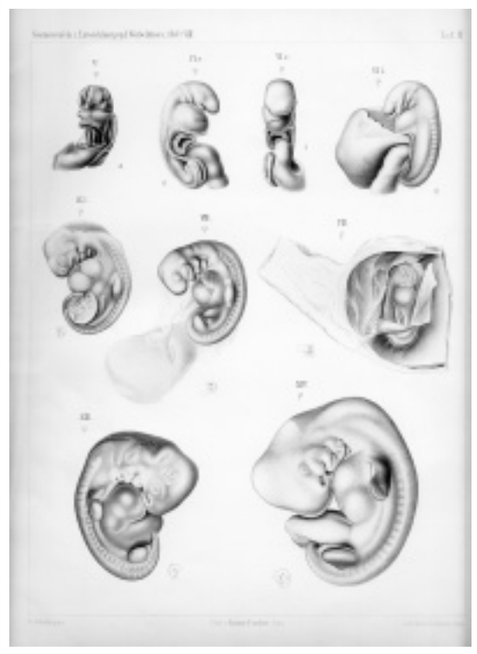
(/embryology/index.php/File:Keibel_Mall_034b.jpg)

(/embryology/index.php/Embryology_History_-_Franz_Keibel)
Franz Keibel (/embryology/index.php/Embryology_History_-_Franz_Keibel) (1861 - 1929)

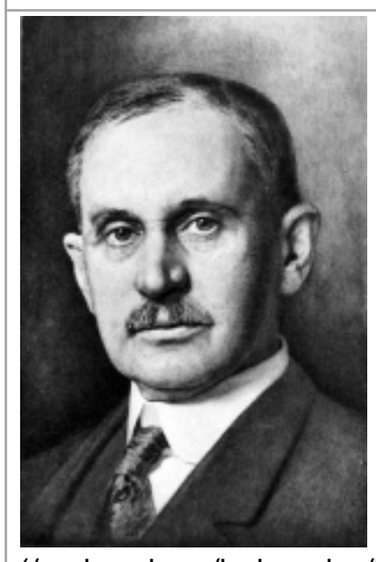
Franz Keibel and Curt Elze (1908) Normal Plates of the Development of the Human Embryo



(/embryology/index.php/File:Keibel1908_plate01.jpg)

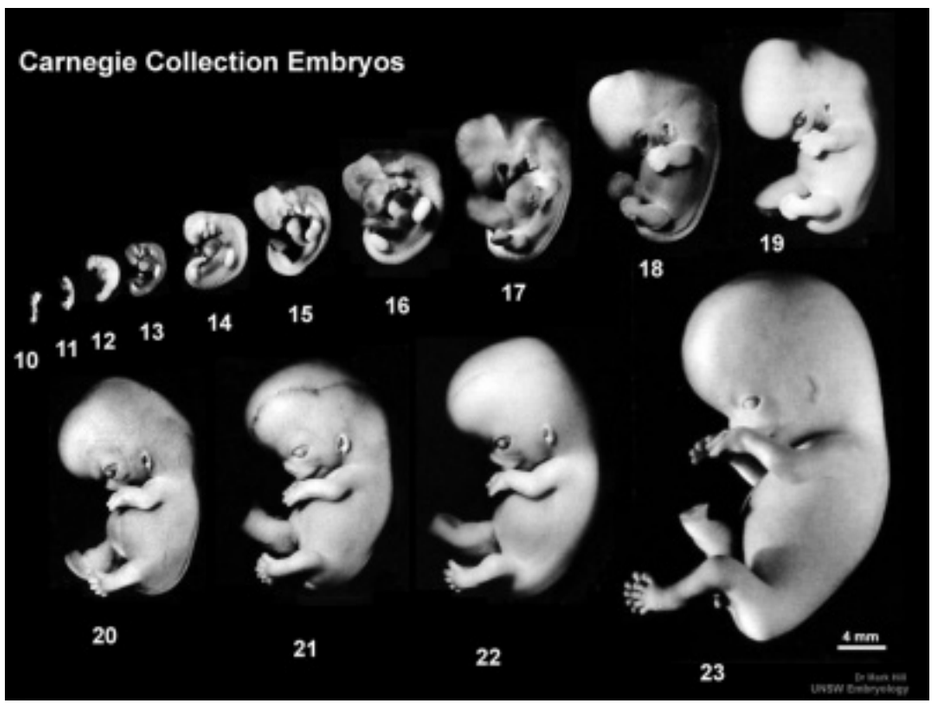


(/embryology/index.php/File:Keibel1908_plate02.jpg)



(/embryology/index.php/File:Franklin_Mall_03.jpg)
Franklin Mall (/embryology/index.php/Embryology_History_-_Franklin_Mall) (1862-1917)

Carnegie Collection (/embryology/index.php/Carnegie_Collection)

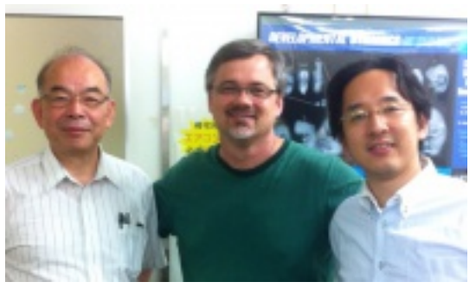


(/embryology/index.php/File:Human_Carnegie_stage_10-23.jpg)

Begun by Dr. Hideo Nishimura (/embryology/index.php/File:Hideo_Nishimura.jpg) (1912–1995)

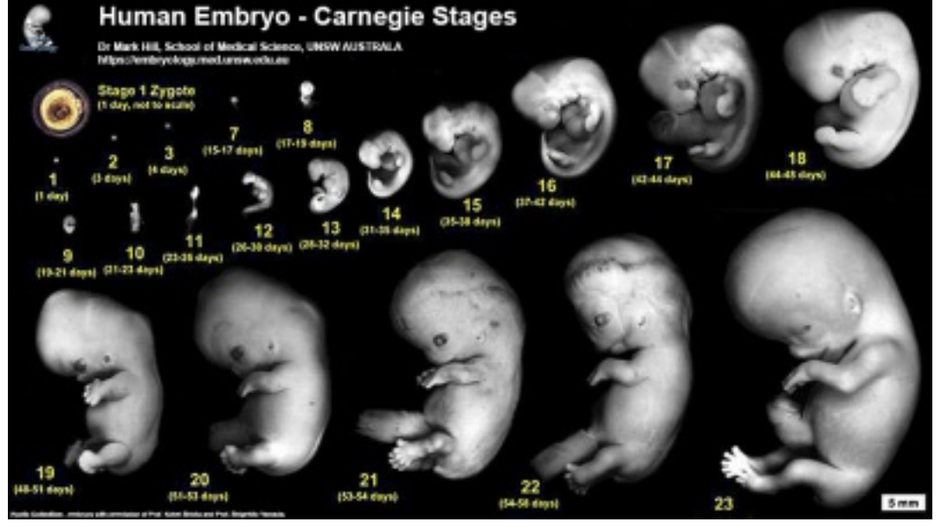
(/embryology/index.php/File:Hideo_Nishimura.jpg)

Developed by Kohei Shiota and currently curated by Shigehito Yamada.



(/embryology/index.php/File:Shiota_Hill_Yamada.jpg)

Kyoto Collection (/embryology/index.php/Kyoto_Collection)

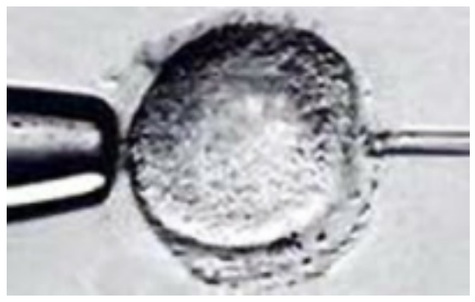


(/embryology/index.php/File:Human_Carnegie_stage_1-23.jpg)

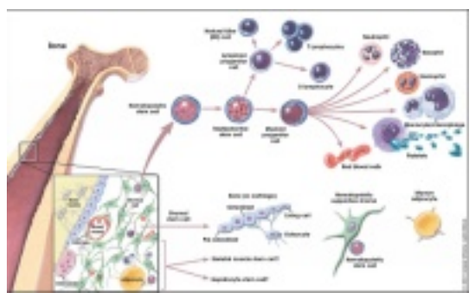
Animal Models [Collapse] (/embryology/index.php/Animal_Development)	
 (/embryology/index.php/Frog_Development)	**Frog Links** (/embryology/index.php/Frog_Development): Frog Development (/embryology/index.php/Frog_Development) | 2009 Student Project (/embryology/index.php/2009_Group_Project_5) | Hans Spemann (/embryology/index.php/Embryology_History_-_Hans_Spemann) | Wilhelm Roux (/embryology/index.php/Embryology_History_-_Wilhelm_Roux) | 1921 Early Frog Development (/embryology/index.php/Book_-_Text-Book_of_Embryology_5) | 1951 Rana pipiens Development (/embryology/index.php/Book_-_The_Frog_Its_Reproduction_and_Development) | Rana pipiens Images (/embryology/index.php/Book_-_The_Frog_Its_Reproduction_and_Development_17) | Frog Glossary (/embryology/index.php/Book_-_The_Frog_Its_Reproduction_and_Development_15) | John Gurdon (/embryology/index.php/Embryology_History_-_John_Gurdon) | Category:Frog (/embryology/index.php/Category:Frog) | Animal Development (/embryology/index.php/Animal_Development) • The frog was used by many of the early embryology investigators and currently there are many different molecular mechanisms concerning development of the frog. • The eggs develop independently, in relative synchrony and are relatively see-through making staging and observation fairly easy. • The frog was a key model for the study of the process of gastrulation.
 (/embryology/index.php/Chicken_Development)	**Chicken Links** (/embryology/index.php/Chicken_Development): Introduction (/embryology/index.php/Chicken_Development) | Chicken stages (/embryology/index.php/Chicken_stages) | Hamburger Hamilton Stages (/embryology/index.php/Hamburger_Hamilton_Stages) | Witschi Stages (/embryology/index.php/Witschi_Stages) | History of the Chick (1883) (/embryology/index.php/Book_-_The_Elements_of_Embryology_-_Volume_1) | Chicken Embryo Development Plates (1900) (/embryology/index.php/Book_-_Normal_Plates_of_the_Development_of_Vertebrates_2) | Chick Early Embryology (1920) (/embryology/index.php/Book_-_The_Early_Embryology_of_the_Chick) | Category:Chicken (/embryology/index.php/Category:Chicken) • The chicken embryo develops and hatches in 20-21 days and historically these were one of the first embryos to be studied. Cutting a window in the egg shell allows direct observation of the embryo. The Hamburger & Hamilton chicken development staging allowed researchers to develop this model as a key embryological tool. • Key research involved the transplanting of quail cells into chick embryos, to later identify their contribution to different embryonic structures, particularly for somite, neural tube and neural crest development.
 (/embryology/index.php/Mouse_Development)	**Mouse Links:** (/embryology/index.php/Mouse_Development) Introduction (/embryology/index.php/Mouse_Development) | Mouse Stages (/embryology/index.php/Mouse_Stages) | Mouse Timeline (/embryology/index.php/Mouse_Timeline) | Mouse Timeline Detailed (/embryology/index.php/Mouse_Timeline_Detailed) | Mouse Estrous Cycle (/embryology/index.php/Mouse_Estrous_Cycle) | Mouse Knockout (/embryology/index.php/Mouse_Knockout) | Movie - Cephalic Plexus (/embryology/index.php/Mouse_Cephalic_Plexus_Movie) | ANAT2341 Project (2009) (/embryology/index.php/2009_Group_Project_4) | Category:Mouse (/embryology/index.php/Category:Mouse) • The mouse has always been a good embryological model, easy to generate (litters 8-20) and quick (21d). • Mouse embryology really expanded when molecular biologists used mice for gene knockouts.
 (/embryology/index.php/Fly_Development)	Fly Development (/embryology/index.php/Fly_Development) - The fruitfly (drosophila) was and is the traditional geneticist's tool. It has been transformed to an magnificent embryologist's tool, with developmental mechanisms being uncovered in this system combined with homolgy gene searches in other species. The fly genome was one of the first to be been completely sequenced. In early development nurse cells *sacrifice* their cytoplasmic contents to allow egg growth and early pattern formation is through the localization of maternal messenger RNAs (mRNAs).
	Worm Development (/embryology/index.php/Worm_Development) - Early embryological studies of the worm *Caenorhabditis elegans* (C.Elegans, so called because of its "elegant" curving movement) characterized the fate of each and every cell in the worm through all stages of development. This worm has recently had its

 (/embryology/index.php/Worm_Development)	entire genome sequenced.
 (/embryology/index.php/Zebrafish_Development)	Zebrafish Development (/embryology/index.php/Zebrafish_Development) - Zebrafish are seen as the latest and greatest "model' for embryological development studies. They can be easily genetically altered and develop as practically "see through" embryos, all internal development can be clearly observed from the outside in the living embryo.

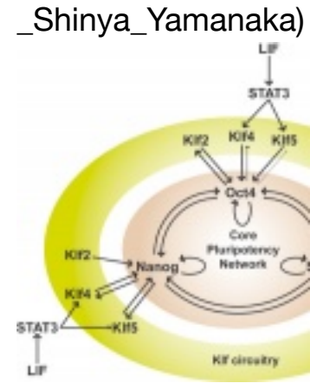
In Vitro Fertilization (/embryology/index.php/Assisted_Reproductive_Technology) (1978)


(/embryology/index.php/File:Intracytoplasmic_sperm_insemination.jpg)

Stem Cells (/embryology/index.php/Stem_Cells) (1981)


(/embryology/index.php/File:Hematopoietic_and_stromal_cell_differentiation.jpg)

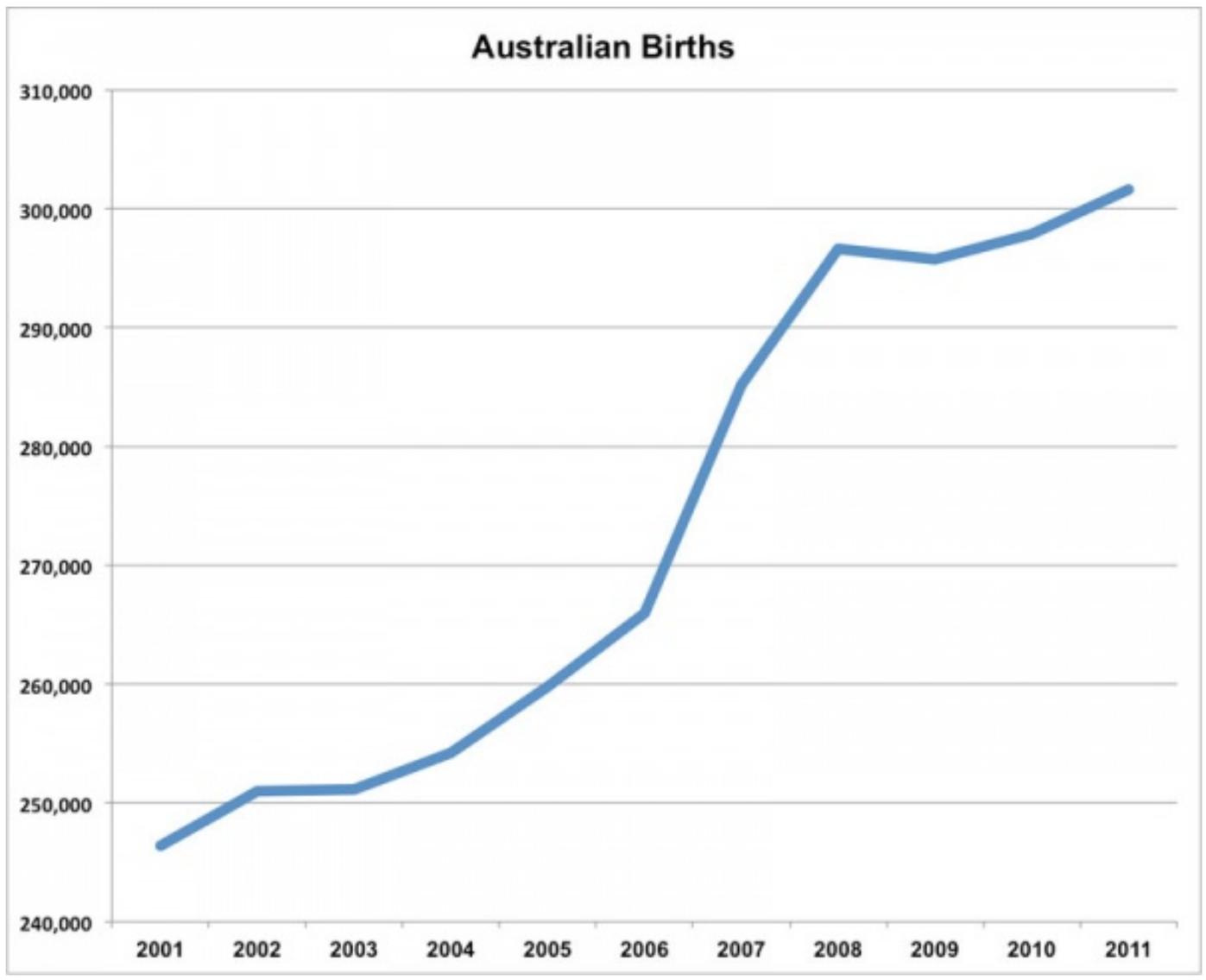
Induced Stem Cells (/embryology/index.p
_Shinya_Yamanaka)



(/embryology/index.php/
_embryonic_stem_c

Australian Data

21 July 2016 the resident population of Australia was projected to be: 24,135,202.



(/embryology/index.php/File:Australian-births_2011.jpg)

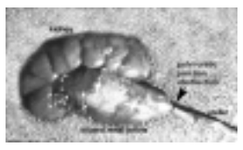
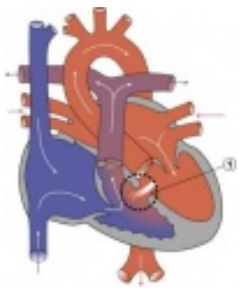
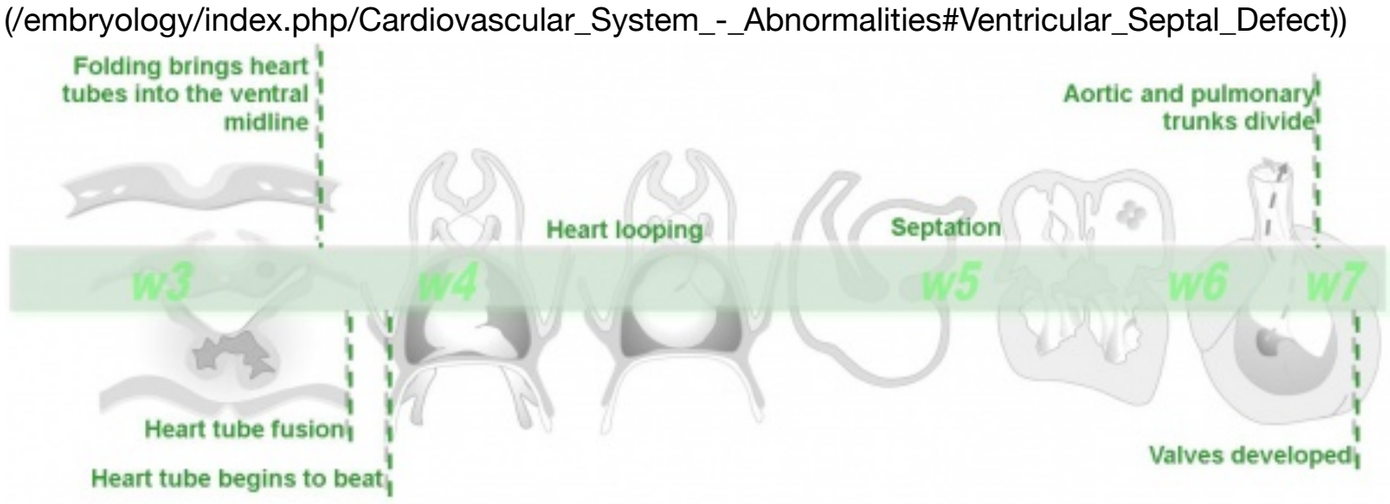
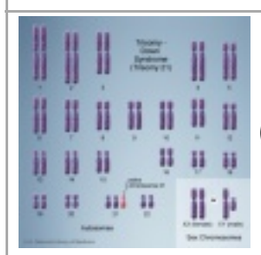
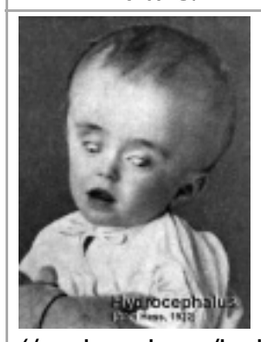
Australian Statistics (/embryology/index.php/Australian_Statistics)

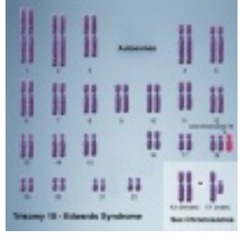
(/embryology/index.php/Australia%E2%80%99s_mothers_and_babies_2013)
Australia's mothers and babies (2013)
Average maternal age in 2013 was **30.1** (/embryology/index.php/Genetic_risk_maternal_age) years, the same as 2009 but still more than the earlier years (2000, 29.0 years; 2002, 29.4 years). Birth number was 309,489 babies in 2013, an increase of 20% from 256,925 in 2003.

(/embryology/index.php/File:Assisted_reproductive_technology_in_Australia_and_New_Zealan
Assisted reproductive technology in Australia and New Zealand (2010)

Assisted Reproductive Technology (/embryology/index.php/Assisted_Reproductive_Technolog
was used by **3.8%** (2009, 3.6%) of women who gave birth.

Victoria - 10 most reported birth anomalies	**[Collapse]**
Based upon statistics from the Victorian Perinatal Data Collection Unit in Victoria between 2003-2004.	

 (/embryology/index.php/File:Hypospadia_classifications.jpg)	**Hypospadias** (More? Genital Male External (/embryology/index.php/External_Genital_Male_Development_Movie) | Genital Abnormalities - Hypospadia (/embryology/index.php/Genital_System_-_Abnormalities#Hypospadia))
 (/embryology/index.php/File:Hydronephrosis.jpg)	**Obstructive Defects of the Renal Pelvis** (obstructive defects of the renal pelvis, uteropelvic junction obstruction, pelvo-uterero junction obstruction) Term describing a developmental renal abnormality due to partial or complete blockage of the drainage of the kidney pelvis requiring surgical correction. The blockage can also have several causes including: unusual ureter (/embryology/index.php/U#ureter) twisting or bending, ureter (/embryology/index.php/U#ureter) compression by a blood vessel, malformations of the muscular wall. The blockage leads to an accumulation of urine in the affected region, with several potential effects: nephron (/embryology/index.php/N#nephron) damage from compression (hydronephrosis); decreased urine output leading to lack of amniotic fluid (oligohydramnios (/embryology/index.php/O#oligohydramnios)); respiratory development effects due to the lack of amniotic fluid (/embryology/index.php/A#amniotic_fluid). • The most common type of obstruction is at the uteropelvic junction (UPJ), between the junction of the ureter and the kidney. • Blockage lower as the ureter enters the bladder, the ureterovesicular junction (UVJ), usually involves only one kidney and the back flow enlarges the affected ureter (megaureter (/embryology/index.php/M#megaureter)). (More? Renal System - Abnormalities (/embryology/index.php/Renal_System_-_Abnormalities) | Renal System Development (/embryology/index.php/Renal_System_Development))
 (/embryology/index.php/File:Ventricular_Septal_Defect.jpg)	**Ventricular Septal Defect** (More? Cardiovascular Abnormalities - Ventricular Septal Defect (/embryology/index.php/Cardiovascular_System_-_Abnormalities#Ventricular_Septal_Defect))  (/embryology/index.php/File:Basic_Heart_Development_Timeline.jpg) Heart Development Timeline (see Basic Cardiac Embryology (/embryology/index.php/Basic_Cardiac_Embryology))
 (/embryology/index.php/File:Congenital_dislocation_hip.jpg)	**Congenital Dislocated Hip** (More? Musculoskelal Abnormalities - Congenital Dislocation of the Hip (CDH) (/embryology/index.php/Musculoskeletal_System_-_Abnormalities#Developmental_Dysplasia_of_the_Hip)) (DHH, congenital dislocated hip (/embryology/index.php/C#congenital_dislocated_hip), congenital hip dislocation, congenital hip dysplasia) Term describes a spectrum of musculoskeletal disorders of hip instability due either to the femoral head being able to move outside the acetabulum (luxation or dislocation), or abnormally within the acetabulum (subluxation or partial dislocation). This includes presentation following a normal examination of the hips in the newborn period (Ortolani (/embryology/index.php/O#Ortolani_test) and Barlow (/embryology/index.php/B#Barlow_test) tests). When detected can be managed with splinting (Denis-Browne splint) allows the hip joint to develop normally and does not require surgery. If undetected and left untreated, the hip joint develops abnormally and surgical reduction is required. (More? Musculoskeletal System Development (/embryology/index.php/Musculoskeletal_System_Development))
 (/embryology/index.php/File:Chromosome-trisomy.jpg)	**Trisomy 21 or Down syndrome** - (More? Trisomy 21 (/embryology/index.php/Trisomy_21))
 (/embryology/index.php/File:Hydrocephalus.jpg)	**Hydrocephalus** (More? Neural Abnormalities - Hydrocephalus (/embryology/index.php/Neural_System_-_Abnormalities#Hydrocephalus) | NINDS - Hydrocephalus Fact Sheet (http://www.ninds.nih.gov/disorders/hydrocephalus/detail_hydrocephalus.htm) | Hydrocephalus Support Association (http://www.hydrocephalus.org.au) | USA National Hydrocephalus Foundation (http://nhfonline.org/treatment.php))
 (/embryology/index.php/File:Cleft_palate.jpg)	**Cleft Palate** (More? Development Animation - Palate 1 (/embryology/index.php/Development_Animation_-_Palate_1) | Development Animation - Palate 2 (/embryology/index.php/Development_Animation_-_Palate_2) | Cleft Palate (/embryology/index.php/Head_Development_-_Abnormalities#Cleft_Palate))

 (/embryology/index.php/File:Chromosome-_trisomy_18.jpg)	**Trisomy 18 or Edward Syndrome** - multiple abnormalities of the heart, diaphragm, lungs, kidneys, ureters and palate 86% discontinued (More? Trisomy 18 (/embryology/index.php/Trisomy_18))
	Renal Agenesis/Dysgenesis - reduction in neonatal death and stillbirth since 1993 may be due to the more severe cases being identified in utero and being represented amongst the increased proportion of terminations (approximately 31%). (More? Renal Abnormalities - Renal Agenesis (/embryology/index.php/Renal_System_-_Abnormalities#Renal_Agenesis.2FDysgenesis))
 (/embryology/index.php/File:Bilateral_cleft_palate.jpg)	**Cleft Lip and Palate** - occur with another defect in 33.7% of cases. (More? Cleft Lip (/embryology/index.php/Head_Development_-_Abnormalities#Cleft_Lip))
Links: Human Abnormal Development (/embryology/index.php/Human_Abnormal_Development) | Australian Statistics (/embryology/index.php/Australian_Statistics) | Victoria 2004 (/embryology/index.php/Template:Victoria_abnormal_data_table_2004) | USA 2006 (/embryology/index.php/Template:USA_Selected_defect_table_2006) | Europe 2010 (/embryology/index.php/Template:European_abnormal_data_table_2010)	

Human Development

(/embryology/index.php/File:Human_development_timeline_graph_02.jpg)

ANAT2341 Course Timetable (/embryology/index.php/ANAT2341_Course_Timetable_2016) **[Expand]**	**ANAT2341Lectures -[Expand]** **Textbook chapters**

Glossary Links

A (/embryology/index.php/A) | B (/embryology/index.php/B) | C (/embryology/index.php/C) | D (/embryology/index.php/D) | E (/embryology/index.php/E) | F (/embryology/index.php/F) | G (/embryology/index.php/G) | H (/embryology/index.php/H) | I (/embryology/index.php/I) | J (/embryology/index.php/J) | K (/embryology/index.php/K) | L (/embryology/index.php/L) | M (/embryology/index.php/M) | N (/embryology/index.php/N) | O (/embryology/index.php/O) | P (/embryology/index.php/P) | Q (/embryology/index.php/Q) | R (/embryology/index.php/R) | S (/embryology/index.php/S) | T (/embryology/index.php/T) | U (/embryology/index.php/U) | V (/embryology/index.php/V) | W (/embryology/index.php/W) | X (/embryology/index.php/X) | Y (/embryology/index.php/Y) | Z (/embryology/index.php/Z) | Numbers (/embryology/index.php/Numbers) | Symbols (/embryology/index.php/Symbols)

Categories (/embryology/index.php/Special:Categories): Frog (/embryology/index.php/Category:Frog) | Mouse (/embryology/index.php/Category:Mouse) | 2016 (/embryology/index.php/Category:2016) | Science-Undergraduate (/embryology/index.php/Category:Science-Undergraduate)

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