

Prenatal Development Timeline

■ Nervous	■ Cardiovascular	■ Muscular	■ Early Events
■ Special Senses	■ Respiratory	■ Skeletal	■ Growth Parameters
■ Blood & Immune	■ Gastrointestinal	■ Endocrine	■ General
■ Skin/Integument	■ Renal/Urinary	■ Reproductive	■ Movement

Unit 1: The First Week









































Day 0 $\frac{1}{2}$ $\frac{1}{2}$	Embryonic period begins
Day 1 $\frac{1}{2}$ $\frac{1}{2}$	Embryo is spherically shaped with 12 to 16 cells
Day 1 - Day 1 $\frac{1}{2}$ $\frac{1}{2}$	Fertilization - development begins with a single-cell embryo!!!
Day 2 $\frac{1}{2}$ $\frac{1}{2}$	Zygote divides into two blastomeres (24 - 30 hours from start of fertilization)
Day 4 $\frac{1}{2}$ $\frac{1}{2}$	Free floating blastocyst
	Inner cell mass
	See where the back and chest will be
Day 6 $\frac{1}{2}$ $\frac{1}{2}$	Embryo attaches to wall of uterus
1 week $\frac{1}{2}$ $\frac{1}{2}$	Placenta begins to form


























Unit 2: 1 to 2 Weeks

1 week, 1 day $\frac{1}{2}$ $\frac{1}{2}$	Positive pregnancy test
1 week, 2 days $\frac{1}{2}$ $\frac{1}{2}$	Cells in womb engorged with nutrients
1 week, 5 days $\frac{1}{2}$ $\frac{1}{2}$	Implantation complete
	Yolk sac





Unit 3: 2 to 3 Weeks

2 weeks, 1 day $\frac{1}{2}$ $\frac{1}{2}$	Rostral-caudal orientation
2 weeks, 2 days $\frac{1}{2}$ $\frac{1}{2}$	Three types of blood-forming cells in yolk sac
2 weeks, 4 days $\frac{1}{2}$ $\frac{1}{2}$	Foregut, midgut, and hindgut














<p>2 weeks, 6 days  1/2 1/2</p>	<p> Brain is first organ to appear</p> <p> Beginnings of the heart can be seen</p>
<p>3 weeks  1/2 1/2</p>	<p> Forebrain, midbrain, and hindbrain</p> <p> Three main divisions of brain</p> <p> Blood and blood vessels</p>
<p>Unit 4: 3 to 4 Weeks</p>	
<p>3 weeks, 1 day  1/2 1/2</p>	<p> Respiratory outgrowth</p>
	<p> Circulatory system function begins</p>
	<p> Heart begins beating</p>
	<p> Tubular heart begins folding</p>
	<p> Umbilical arteries</p>
	<p> Umbilical veins (right and left)</p>
	<p> Body cavities</p>
<p>3 weeks, 3 days  1/2 1/2</p>	<p> Liver</p> <p> Membrane between future mouth and throat may begin to rupture</p>
<p>3 weeks, 5 days  1/2 1/2</p>	<p> First part of pancreas</p>
	<p> Lung bud</p>
	<p> Descending aorta</p>
	<p> Lowermost spinal cord formation begins</p>
	<p> Neural tube closes (lower back)</p>
	<p> Upper limb primordium at level of somites 8 to 10</p>
	<p> Progressively C-shaped embryo</p>
<p>4 weeks  1/2 1/2</p>	<p> Skin is so thin, you can see through it!</p>
	<p> Esophagus primordia</p>
	<p> Pancreas: Ventral pancreas</p>
	<p> Pharynx</p>
	<p> Small & large intestines</p>
	<p> Lungs begin filling chest cavity</p>
	<p> Trachea</p>
	<p> Circulatory system "well established"</p>
	<p> Functioning two-chamber heart</p>
	<p> Heart rate (about) 113 beats/min</p>
	<p> Fourth ventricle</p>
	<p> Cervical flexure</p>
	<p> Limb buds - the first sign of arms and legs</p>

	 Umbilical cord emerging  Upper and lower limb buds
Unit 5: 4 to 5 Weeks	
4 weeks, 4 days $\frac{1}{2}$ $\frac{1}{2}$	 Nose: Nasal pits
4 weeks, 5 days $\frac{1}{2}$ $\frac{1}{2}$	 Brain: Cerebral hemispheres appear and begin rapid growth  Blood vessels penetrate diencephalon
5 weeks $\frac{1}{2}$ $\frac{1}{2}$	 Brain with five main sections  First nerve fibers  Lobar pattern mimics adult pattern  Pacemaker cells  Head is one third of entire embryo
Unit 6: 5 to 6 Weeks	
5 weeks, 2 days $\frac{1}{2}$ $\frac{1}{2}$	 All cranial nerves identifiable
5 $\frac{1}{2}$ weeks $\frac{1}{2}$ $\frac{1}{2}$	 Initial tooth formation
5 $\frac{1}{2}$ weeks - 6 weeks $\frac{1}{2}$ $\frac{1}{2}$	 Subtle movement begins
5 weeks, 6 days $\frac{1}{2}$ $\frac{1}{2}$	 Primordial vermiform appendix
6 weeks $\frac{1}{2}$ $\frac{1}{2}$	 Face withdraws from light touch around mouth  Blood forming in liver  Tooth buds (primary teeth)  Intestines fill base of umbilical cord  External ears
Unit 7: 6 to 7 Weeks	
6 weeks, 2 days $\frac{1}{2}$ $\frac{1}{2}$	 Elbow regions sometimes identifiable
6 $\frac{1}{2}$ weeks $\frac{1}{2}$ $\frac{1}{2}$	 Humerus, radius, and ulna  Submandibular gland primordia  Brainwave activity has begun  The hands begin to move  Bones first form in the collar bones and lower jaw


















6 weeks, 5 days $\frac{1}{2}$ $\frac{1}{2}$	Arms point forward
	Beginnings of occipital and sphenoid bones
6 weeks, 6 days $\frac{1}{2}$ $\frac{1}{2}$	Cloacal membrane ruptures
7 weeks $\frac{1}{2}$ $\frac{1}{2}$	Head rotates
	Leg movements
	Ovaries
	Hiccups
	The heart has four chambers and is nearly complete.
	The heart rate peaks at 165 to 170 beats per minute.
Unit 8: 7 to 8 Weeks	
7 weeks, 1 day $\frac{1}{2}$ $\frac{1}{2}$	Upper limbs with slightly flexed elbows
	Sacrocaudal spinal cord formation (secondary neurulation) complete
7 weeks, 1 day - 8 weeks $\frac{1}{2}$ $\frac{1}{2}$	Stomach: Folds in stomach wall
7 weeks, 2 days $\frac{1}{2}$ $\frac{1}{2}$	Arteries and veins of heart complete
7 weeks, 3 days $\frac{1}{2}$ $\frac{1}{2}$	The knee joints have arrived
	Eyelids growing rapidly
7 $\frac{1}{2}$ weeks $\frac{1}{2}$ $\frac{1}{2}$	Fingertips thicken
	EKG pattern similar to adult
7 weeks, 4 days $\frac{1}{2}$ $\frac{1}{2}$	The fingers are free
7 weeks, 5 days $\frac{1}{2}$ $\frac{1}{2}$	Bone-forming cells emerge
	Hands can reach one another and fingers can overlap
8 weeks $\frac{1}{2}$ $\frac{1}{2}$	Complex response to touch
	More frequent hand-to-face contact
	Urine production and release
	Occasional breathing motions begin
	Blood supply to the brain closely resembles adult pattern
	Ear drum

	 "The hindbrain "presents striking resemblance to that of the newborn."
	 Brain represents 43% of embryo
	 Right- and left-handedness emerges
	 Embryonic Period Ends












Unit 9: 8 to 9 Weeks

8½ weeks   	 Eyelids completely fused
9 weeks   	 Bends hip & knee if sole of foot touched
	 Drinking fluid is becoming routine
	 Sucking the thumb
	 The young fetus now sighs, stretches, moves the head, opens the mouth, and moves the tongue
	 Thyroid gland weighs 2 grams
	 Face, hands, and feet sense light touch







Unit 10: 9 to 10 Weeks

9 weeks - 10 weeks   	 My weight will rise more than 75% this week
9 weeks, 4 days   	 Yawns
10 weeks   	 Palatine tonsils
	 Fingernails and toenails begin to grow!
	 Three-layered epidermis
	 Tiny unique fingerprints have arrived!
	 Now, all the bones are getting harder
	 Tooth buds (secondary teeth)

Unit 11: 10 to 11 Weeks

10½ weeks   	 Volar and plantar pads regress
11 weeks   	 Nose & lips completely formed
	 Now you can tell if your baby is a girl or a boy!
	 Thyroid gland weighs 12 grams
	 Intestines absorb water & glucose

Unit 12: 11 to 12 Weeks

12 weeks   	 Many different hormones are present in pituitary gland
	 Upper limbs reach final proportion
	 Bowel movements

	<div></div> Liver: Bile production begins
	<div></div> There are taste buds all over the mouth
	<div></div> Head circumference 10 cm
Unit 13: 3 to 4 Months	
13 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Teeth are growing
	<div></div> Most of body sensitive to touch
14 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Girls move their jaws more than the boys do
	<div></div> Light touch to mouth evokes turn toward stimulus
	<div></div> Cerebellum resembles adult structure
	<div></div> Fat deposits in cheeks
15 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Body fat emerges throughout the body
16 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Quickening
	<div></div> Fat deposits upper & lower limbs
Unit 14: 4 to 5 Months	
18 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Cream-like substance protects skin
	<div></div> Sweat glands
19 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Melanin production
	<div></div> Daily cycles in biological rhythms
20 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> All skin layers and structures
	<div></div> Hearing and responding to sound begins
	<div></div> Hearing and responding to sound begins
	<div></div> Head circumference 20 cm
Unit 15: 5 to 6 Months	
20 weeks - 24 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Eyelids separate, eyes open and close
21 weeks - 22 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> If born prematurely from this point on, survival is possible
23 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Brain weight 100 grams
Unit 16: 6 to 7 Months	
25 weeks $\frac{1}{2}$ $\frac{1}{2}$	<div></div> Intestinal lining contains all adult cell types

	<div></div> The ability to taste
26 weeks $\frac{1}{2}$	<div></div> Additional fat deposits decrease wrinkles
26 weeks - 38 weeks $\frac{1}{2}$	<div></div> The ability to smell has arrived <div></div> Brain weight increases 400% to 500%
27 weeks $\frac{1}{2}$	<div></div> Pupils react to light
Unit 17: 7 to 8 Months	
30 weeks $\frac{1}{2}$	<div></div> Breathing motions are common even though there is no air in the womb
32 weeks $\frac{1}{2}$	<div></div> Head circumference 30 cm <div></div> Esophagus: Lower esophagus muscles functional
Unit 18: 8 to 9 Months	
32 weeks - 36 weeks $\frac{1}{2}$	<div></div> Prenatal food affects newborn taste preferences
35 weeks $\frac{1}{2}$	<div></div> Firm grip
36 weeks $\frac{1}{2}$	<div></div> Brain weight 300 grams
Unit 19: 9 Months to Birth	
37 weeks $\frac{1}{2}$	<div></div> Fetus drinks an estimated 15 oz (or 450cc) of amniotic fluid/day
38 weeks $\frac{1}{2}$	<div></div> Heart beats 54 million times before birth
	<div></div> Brain weight 350 grams
	<div></div> Fetus initiates labor
	<div></div> Head circumference 35 cm
	<div></div> Time to be born!