

Unit 2 - Area of study 1

Understanding childhood.



Introduction

- ◆ Individual human development is perceived as involving a series of **orderly** and **predictable** changes. These developmental changes occur to the physical, social, emotional and intellectual self.
- ◆ Stages of conception to late childhood includes:-
 - ❖ Prenatal – conception to birth.
 - ❖ Infant – birth – 2 years old
 - ❖ Toddlers – 2 – 3 years old
 - ❖ Middle childhood – 3 – 6 years old
 - ❖ Late childhood – 6 – 12 years old.



6 Principles of Individual Human Development

1. Development requires change.
2. Early development is essential for later development..
3. The general pattern of development is orderly and predictable.
4. Development equals maturation plus learning
5. Rates of development are unique.
6. Growth and development are continuous.



Prenatal development

- ◆ Prenatal period of development is the time from the point of conception until birth.
- ◆ This period of time generally lasts for 39 weeks.

Conception.

- ◆ The point at which sperm and ovum combine and the genetic information is fused is referred to as conception.

Figure 8.2 The likelihood of conception depends on when sex occurs with respect to the day of ovulation

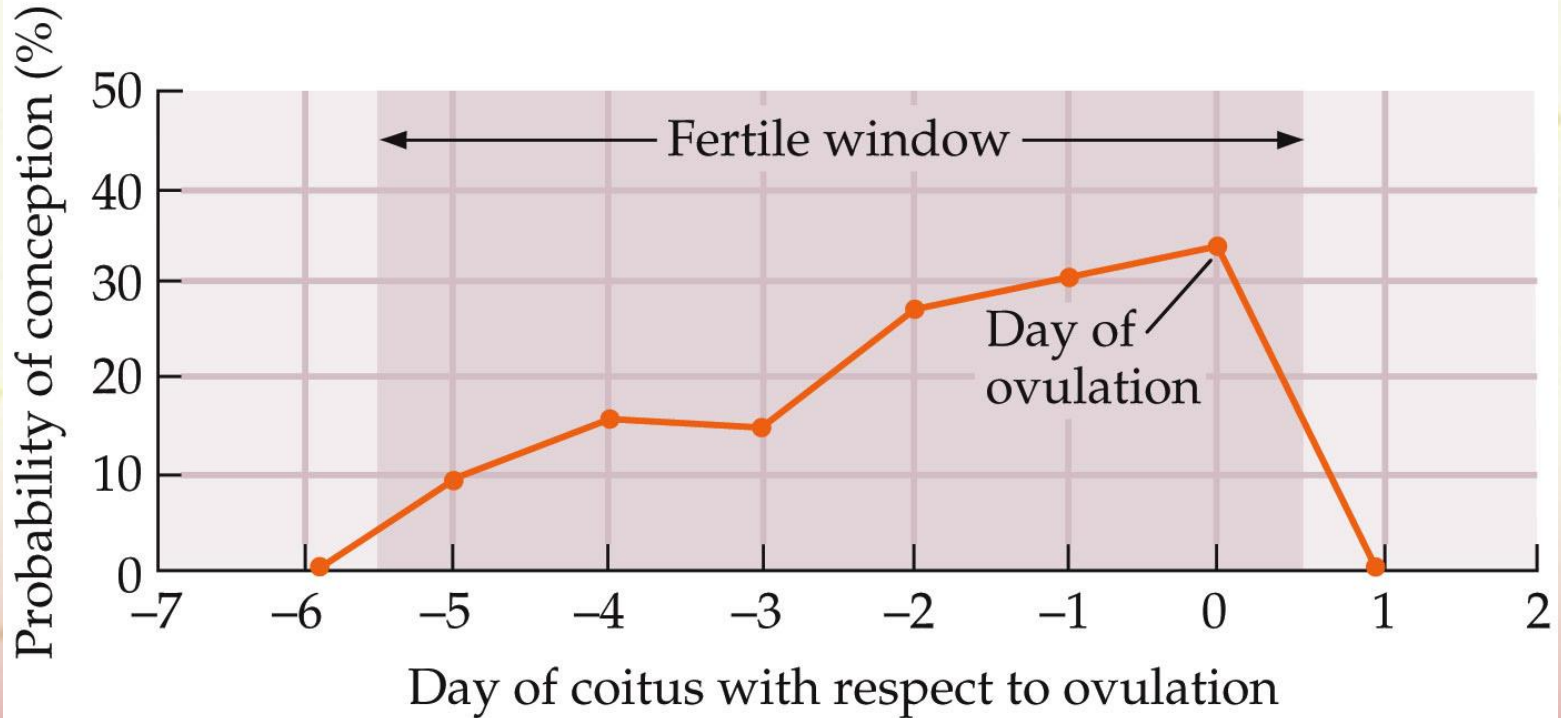


Figure 8.4 Standard in vitro fertilization (Part 2)

(B)

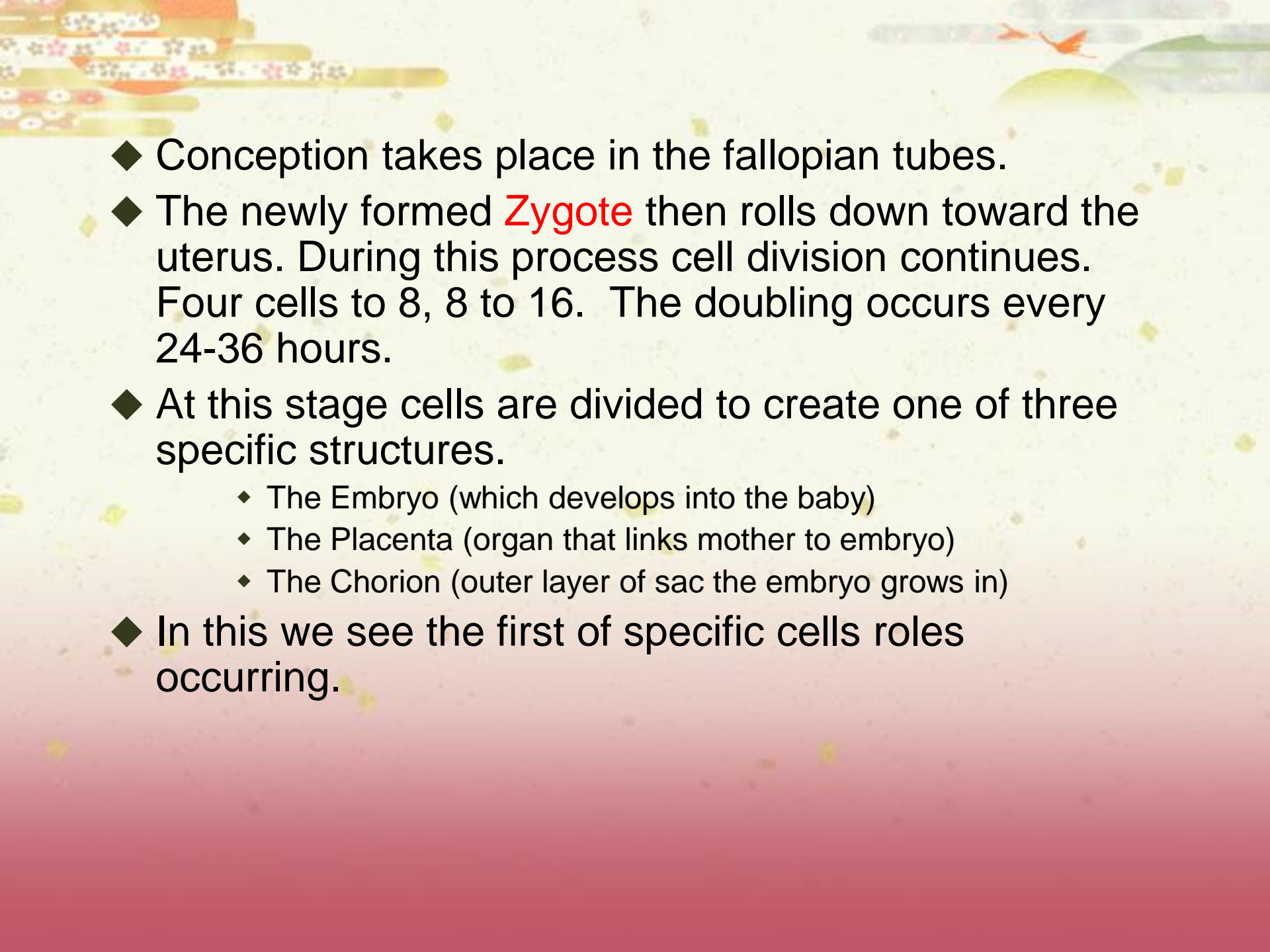


Stages of prenatal development

- ◆ The average pregnancy is 39-40 weeks long.
- ◆ A pregnancy is typically divided into 3 time spans:-
 - ◆ First trimester - conception to 3 months
 - ◆ Second trimester - 4 - 6 months
 - ◆ Third trimester - 7 - 9 months
- ◆ However the growth and development of the new individual is examined in terms of milestones. These three stages are:-
 - ◆ Germinal Stage - conception to end of week 2
 - ◆ Embryonic Stage - end of week 2 to end of week 8
 - ◆ Foetal Stage - end of week 8 to birth.


Germinal stage



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- ◆ Conception takes place in the fallopian tubes.
 - ◆ The newly formed **Zygote** then rolls down toward the uterus. During this process cell division continues. Four cells to 8, 8 to 16. The doubling occurs every 24-36 hours.
 - ◆ At this stage cells are divided to create one of three specific structures.
 - ◆ The Embryo (which develops into the baby)
 - ◆ The Placenta (organ that links mother to embryo)
 - ◆ The Chorion (outer layer of sac the embryo grows in)
 - ◆ In this we see the first of specific cells roles occurring.

Picture of Morula



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- ◆ The **Morula** continues the process of mitosis.
 - ◆ On reaching 64 cells it is now called a **Blastocyst**.
 - ◆ The Blastocyst must find a source of nourishment.
 - ◆ It attaches to the endometrium and feeds on the blood lining of the uterus.
 - ◆ This entire process takes approx. 2 weeks. Once the implantation has occurred and the Blastocyst is secure it is referred to as an '**Embryo**'.
 - ◆ We know the embryo stage of development begins when the female begins producing the hormone HCG (Human Chorionic Gandotrophic).

Role of Placenta in Pregnancy

- ◆ Attaches developing embryo to the uterus.
- ◆ Made of maternal and embryonic tissue.
- ◆ Links blood supply of embryo to blood supply of mother.
- ◆ Allows for exchange of oxygen, nutrient and waste products.
- ◆ Produces hormones to maintain and regulate pregnancy. (hCG in particular)
- ◆ Filters unwanted materials.

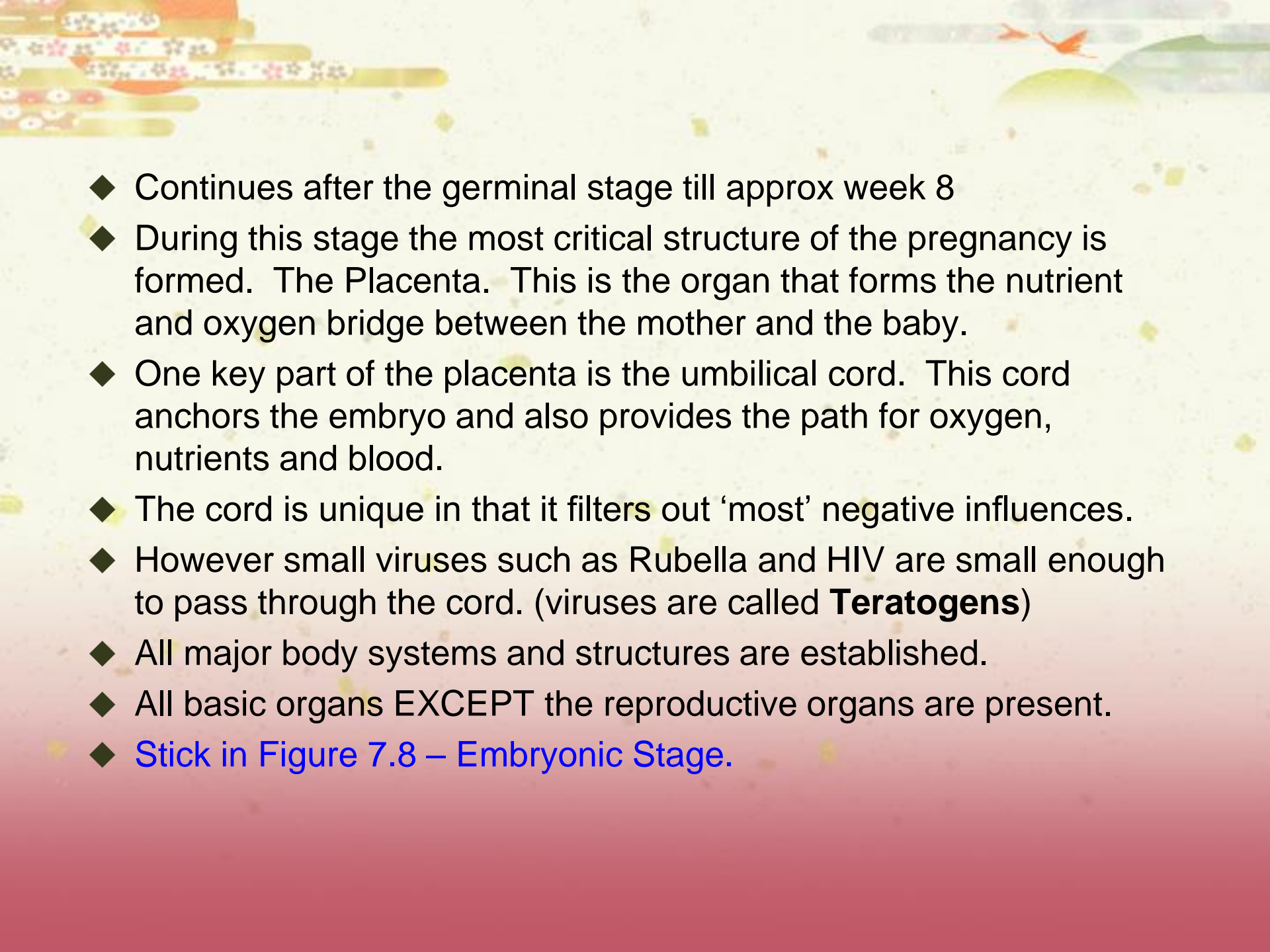
Role of umbilical cord in pregnancy

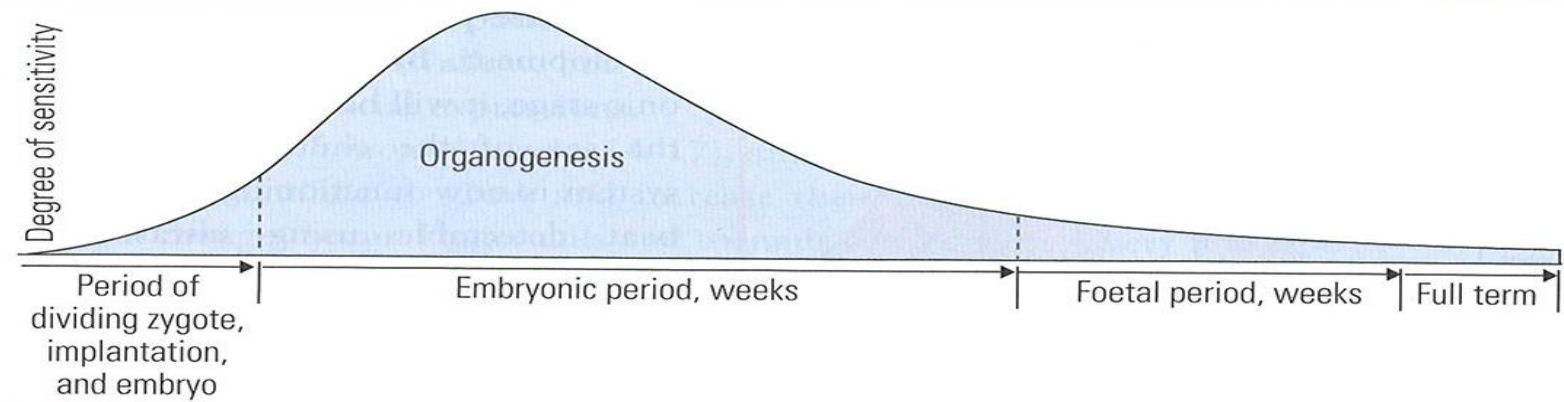


- ◆ Is a connection from the embryo to the placenta.
- ◆ Has two main veins running through it.
 - ❖ One moves oxygenated, nutrient rich blood from the placenta.
 - ❖ Second returns the deoxygenated, nutrient-depleted blood.

Embryonic Stage




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- ◆ Continues after the germinal stage till approx week 8
 - ◆ During this stage the most critical structure of the pregnancy is formed. The Placenta. This is the organ that forms the nutrient and oxygen bridge between the mother and the baby.
 - ◆ One key part of the placenta is the umbilical cord. This cord anchors the embryo and also provides the path for oxygen, nutrients and blood.
 - ◆ The cord is unique in that it filters out 'most' negative influences.
 - ◆ However small viruses such as Rubella and HIV are small enough to pass through the cord. (viruses are called **Teratogens**)
 - ◆ All major body systems and structures are established.
 - ◆ All basic organs EXCEPT the reproductive organs are present.
 - ◆ [Stick in Figure 7.8 – Embryonic Stage.](#)



1	2	3	4	5	6	7	8	9	16	20-36	38
Usually not susceptible to teratogens		Indicates common site of action of teratogen									
		Central nervous system Heart	Eye Heart Eye Arm Leg		Ear Teeth		Palate Ear External genitalia			Brain	
						Heart		Arms Legs	Central nervous system		
									Eyes		
									Teeth Palate		
									External genitalia Ear		
Prenatal death		Major structural abnormalities					Physiological defects and minor structural abnormalities				

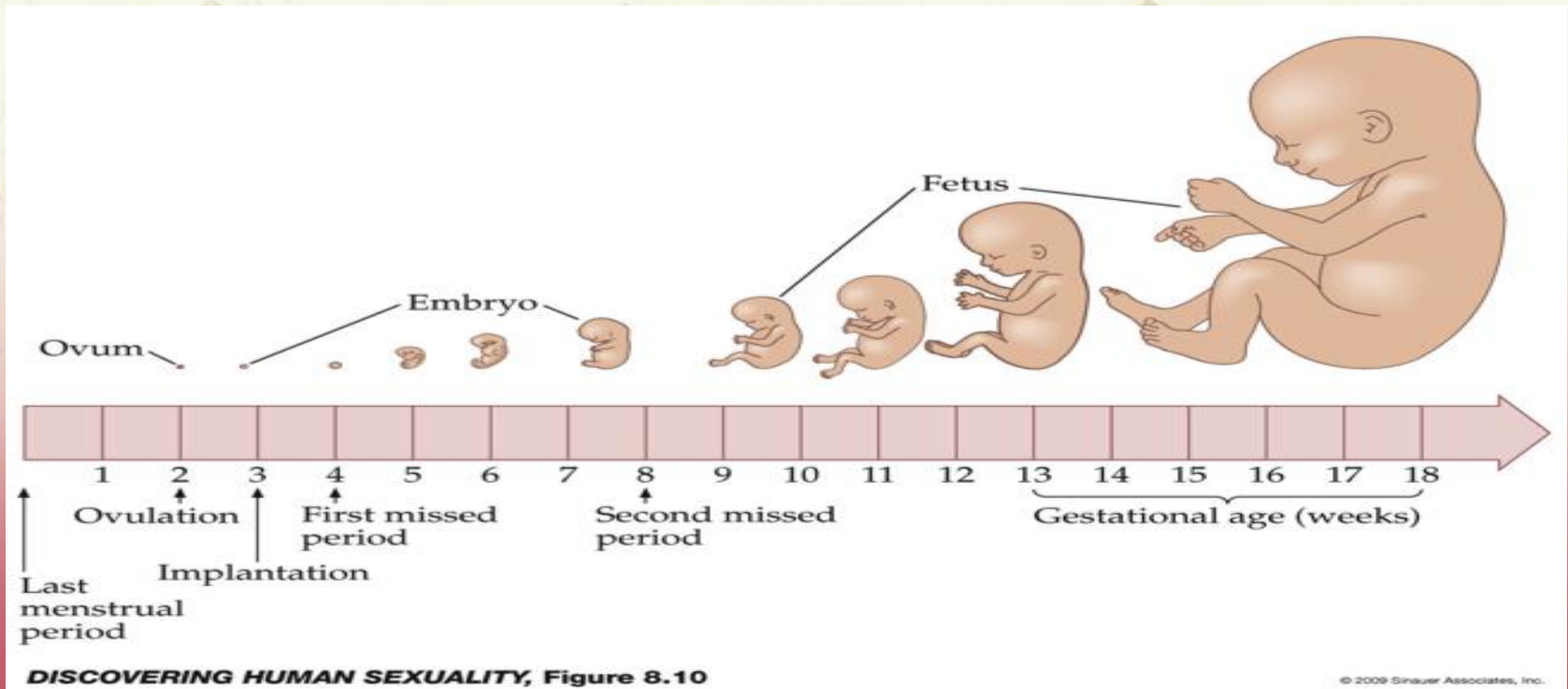
Figure 8.5 Critical periods in prenatal development.

The background features a light yellow-to-pink gradient with scattered gold and yellow specks. In the top left, there are horizontal bands with floral and geometric patterns. In the top right, there are stylized green hills, a yellow sun or moon, and two orange birds in flight.

Foetal Stage

Foetal Stage - 8 - 39/40 weeks

- ◆ Begins at end of week 8 and ends at the birth.
- ◆ All body parts increase in size and with increasing complexity.



Weeks 9 -13

- ◆ All major organs complete formation.
- ◆ Foetus is active, movement is felt by mother.
- ◆ Foetus can move parts of its face, (needs to do this to perform swallowing action)

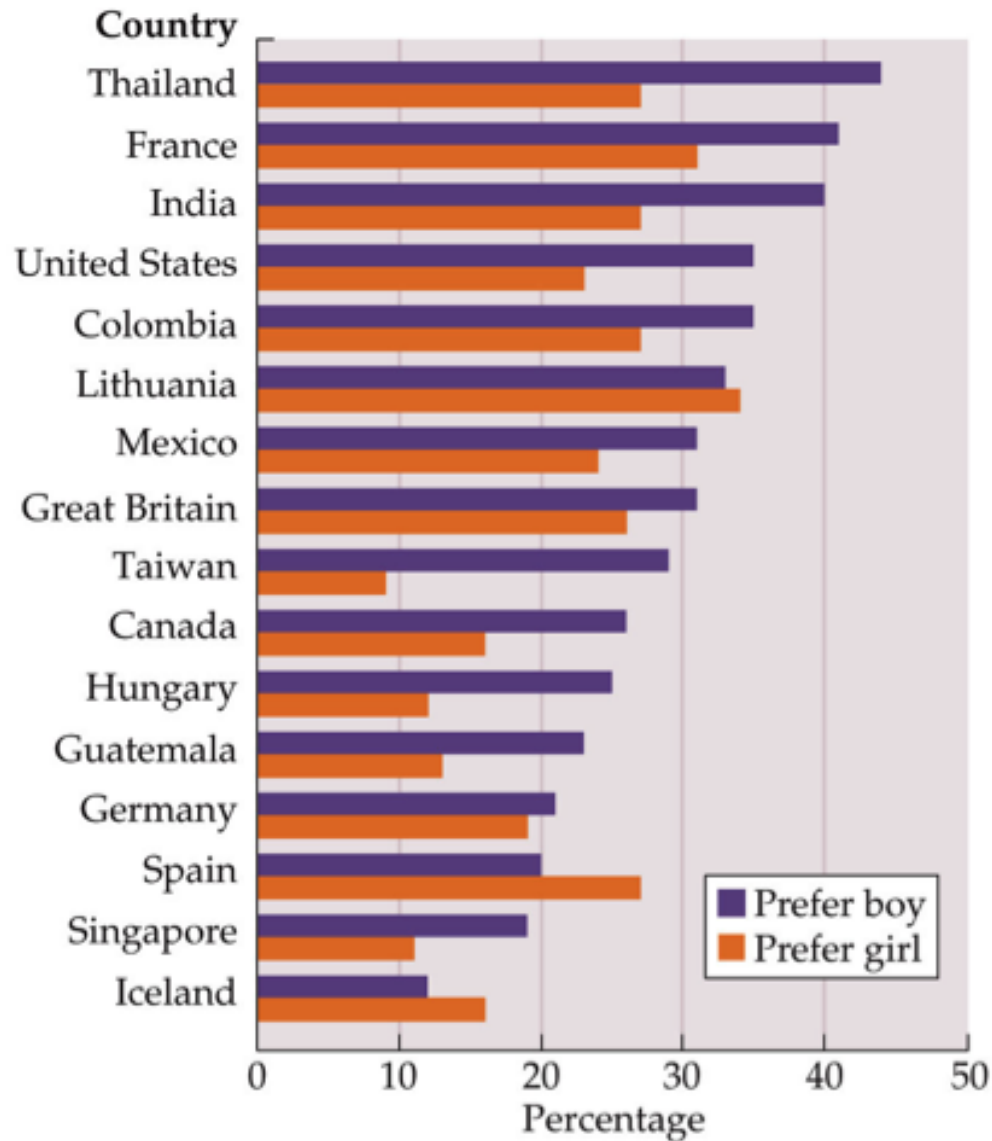
Weeks 14-17

- ◆ Fingernails and toenails can be seen
- ◆ Skin begins to change in transparency.
- ◆ Neural development takes place.
Foetus can coordinate movements. It is capable of reflex movements, and responds to sound.

Weeks 18-21

- ◆ Hair begins to grow, eyebrows and eyelashes
- ◆ Voluntary movements (thumb sucking)
- ◆ Involuntary movements (hiccups)
- ◆ Heartbeat easily detected with stethoscope
- ◆ Sex is easily detected. Use of ultrasound.

Gender preference.





Weeks 22-26

- ◆ Foetus begins preparation for birth
- ◆ Skin becomes waterproof with vernix
- ◆ Begins to store fatty tissue
- ◆ Digestive system develops
- ◆ Foetus has eye reflexes (open & close)



Weeks 27-30

- ◆ If born at this stage would most likely live.
- ◆ Basic breathing movements (although swallowing fluid at present)
- ◆ Very physically active

Weeks 31-35

- ◆ Foetus attempts to move upside down.
- ◆ Brain development continues and performs basic life functions (sleep-wake cycles)
- ◆ Weight is rapidly gained
- ◆ Increase in iron to foetus is vital as blood production is now occurring at lightening speed.
- ◆ Foetus is now very responsive to sound.

Week 36-40

- ◆ Foetus draws antibodies from mother for protection from infection.
- ◆ Foetus looks less wrinkled
- ◆ Foetus becomes less active (not enough space)



Adaptations of the Neonate



4 key adaptations

- ◆ The neonate must adapt to living in air and not water. As soon as the umbilical cord is cut it must adapt in 4 main ways:-
 - ◆ Physical movement and reflexes
 - ◆ Circulation and breathing
 - ◆ Digestion and removal of wastes
 - ◆ Temperature control.

Movement & response

- ◆ A neonate is born with inbuilt survival mechanisms.
- ◆ These mechanisms relate to movement of body parts (both internal & external) that allow the neonate to thrive outside the uterus.
 - ◆ Breathing - oxygen supply after birth
 - ◆ Sucking - brush cheek or lips produce sucking response for nourishment.
- ◆ Figure 7.4 page 210 has an extensive list

Circulation (blood flow) & respiration (breathing)

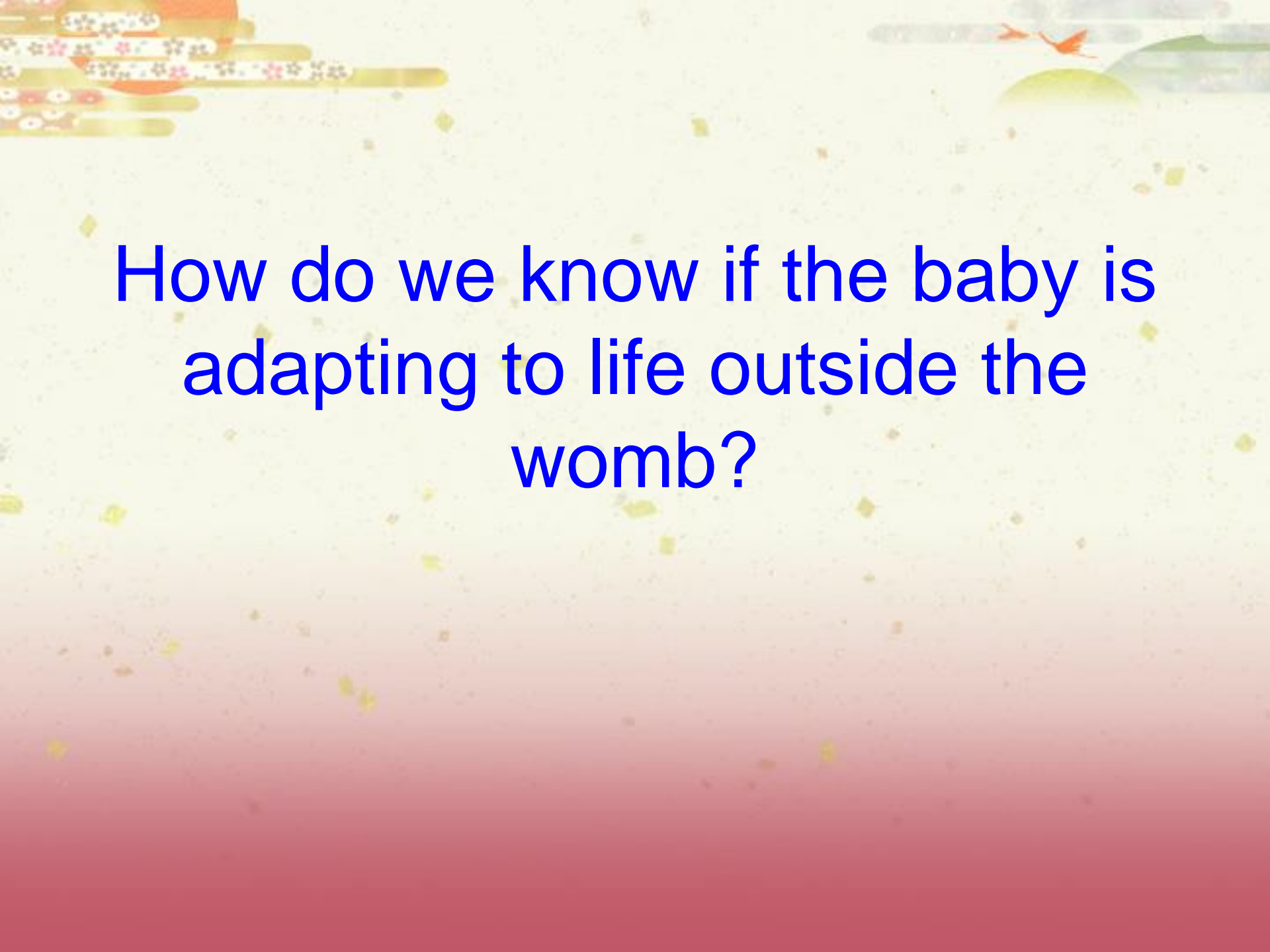
- ◆ Prenatal the foetus uses the placenta for oxygen, elimination of waste products (including carbon dioxide). Umbilical cord passes oxygen rich blood across the Foramen Ovale.
- ◆ Neonates heart changes.
- ◆ Cutting the umbilical cord cuts off the oxygen supply from the placenta.
- ◆ The Foramen Ovale closes over. This squeezes liquid from the lungs, forcing the neonate to expand their lungs.
- ◆ The pressure of the expansion forces large amounts of blood to the heart. Instead of using the top two chambers only the heart is forced to respond.

Change in temp. control

- ◆ The prenatal environment is a constant 37 degrees.
- ◆ Birth causes shock as temp drops.
- ◆ To create heat the neonate must increase metabolism.
- ◆ This can only be done through intake & digestion of food and physical activity.
- ◆ To dissipate heat (or cool down) perspiration must be produced this also requires energy.
- ◆ Use of clothing is essential in temperature control of a neonate

Changes to digestion and waste removal

- ◆ Prenatal - all wastes and carbon dioxide from the foetus were removed through the placenta. Foetus would feed through umbilical cord therefore digestive system was not required
- ◆ Neonatal – Urination and bowel movements take place outside the body. Feeding takes place through mouth, using tongue and into the stomach for processing.

The background features a soft gradient from light yellow at the top to a deep pinkish-red at the bottom. In the upper left corner, there are decorative horizontal bands with floral and geometric patterns. In the upper right, there are stylized green hills and two orange birds in flight. The text is centered in a bold, blue, sans-serif font.

How do we know if the baby is
adapting to life outside the
womb?

THE APGAR SCALE

- ◆ One minute after birth and then five minutes after birth a series of quick tests are applied to the new born to check adaptations.
- ◆ This test is known as the Apgar Scale Test. It looks for:-
 - ◆ Appearance (body colour)
 - ◆ Pulse (heart rate)
 - ◆ Grimace (reflex irritability)
 - ◆ Activity/muscle movement (muscle tone)
 - ◆ Respiration (respiratory effort)
- ◆ A score of 0-2 is given for each point. 10 is perfect health. 3 and under indicates severe health problems.
- ◆ The rating the baby gets is an indication of the health gains made by the neonate.