Conception + Major Periods of Development

Conception prenatal development begins; once every 28 days, in the middle of a woman's menstrual cycle, an ovum bursts from her ovaries and goes to one of the Fallopian tubes. While the ovum is traveling the corpus luteum (the spot on the ovary from which the ovum was released), secretes hormones that prepare the uterus lining to receive a fertilized ovum. If pregnancy does not occur, the corpus luteum shrinks, and the lining of the uterus is discarded two weeks later with menstruation. Males produce sperm in an average of 300 million a day in the testes. The sperm travel upstream in the female reproductive tract, through the cervix, and into the Fallopian tube, where fertilization takes place.

Conception + Major Periods of Development (cont)

The Germinal Period lasts for about 2 weeks; from fertilization of the zygote until the tiny mass of cells moves down and out of the Fallopian tube, attaching to the wall of the uterus. the zygotes 1st cell duplication is long, taking 30 hours. New cells are gradually added at a faster rate. By the 4th day, 60 to 70 cells exist and form a blastocyst, which contains the embryonic disk and becomes the new organism. Implantation occurs and the amnion membrane encloses the organism in amniotic fluid to help maintain temperature of prenatal environment. The placenta brings the embryo and the mothers blood together. The umbilical cord that is connected to the placenta delivers blood with nutrients, oxygen, and hormones to the fetus and removes waste products

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Conception + Major Periods of Development (cont)

The Period of the Embryo lasts about 6 weeks (2nd-8th week of pregnancy). During the 3rd week, three cell layers form to give rise to all body parts. The ectoderm folds over the neural tube and swells to form the brain and spinal cord (nervous system). The heart begins to pump blood, muscles, backbone, ribs, and the digestive tract appear. During the 2nd month, the eyes, ears, nose, jaw, and neck form. Tiny buds become the arms, legs, fingers, and toes

Conception + Major Periods of Development (cont)

The Period of the Fetus-(the "-growth and finish-ing" phase) lasts for 30 weeks (from 9th week to end of pregnancy); In the 3rd month (1st trimester), the organs, muscles, and nervous system develop and become organized and connected. Touch sensitivity extends throughout the body. The lungs begin to expand and contract. External genitals are formed and the sex of the fetus can be determined by ultrasound. In the 2nd trimester, organs are well-developed by the 20th week and most of the brains neurons are in place. The mother can feel the movements of the fetus. In the 3rd month, the fetus has new behavioral capacities: at 20 weeks it can be stimulated and irritated by sounds. In the third trimester, the **age of viability** is between 22 and 6 weeks. This is the point at which the baby can first survive if born prematurely. The fetus takes on the beginnings of personality. Between 23 and 30 weeks, connections form between the cerebral cortex and brain regions involved in pain sensitivity. The fetus shows a greater responsiveness to external stimulation, including pain increases, and the fetus begins to distinguish between tone and rhythm of different voices and sounds. The fetus receives antibodies from the mothers blood that protects them against illness. Around 28 weeks, the fetus can blink in reaction to nearby sounds. At 30 weeks, the fetus can react to a repeated auditory stimulus against the mothers abdomen by a rise in heart rate and electrical brain recordings.

Environmental Influences

Sensitive Period in Prenatal Development	Factors affecting: environmental agents or teratogens, maternal factors (stress). The central nervous system is one of the most sensitive systems to the outside agents throughout the first 16 weeks of pregnancy.

Environmental Influences (cont)

Teratogen	any environmental agent that causes damage during the prenatal period. Harm done by teratogens is affected by: dose: larger doses of teratogens over longer time periods have more negative effects, heredity: the genetic makeup of the mother and developing organism play an important role. Some individuals are better than others to withstand harmful environments, age: effects of teratogens vary with age of organism at time of exposure. During a sensitive period, when a part of the body is prepared to develop rapidly, it is especially sensitive to its surroundings. If environment is harmful, damage occurs. and recovery is difficult and maybe impossible, other negative influences: additional teratogens, poor nutrition, and lack of medical care can worsen the impact of a harmful agent, delayed health effects may show up decades later. Serious defects are most likely to happen during the embryonic period. Effects of teratogens illustrate bidirectional. Influences between child and environment

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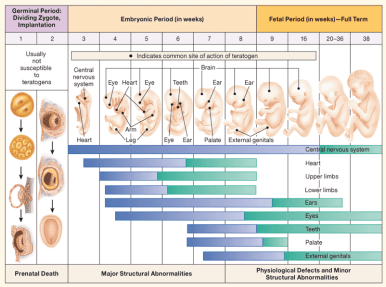
Sensitive Periods



Teratogenic Substances

Drugs	**prescription and nonprescription, and illegal**	Thalidomide, a sedative used in 1960s caused severe limb deformation in embryos.
		Diethylstilbestrol (DES), widely prescribed between 1945 and 1970 to prevent miscarriages, caused high rates of cancer and infertility in daughters of mothers who took the drug
		Accutane (isotretinoin), prescribed to treat severe acne, is the most widely used potent teratogen today
		Persistent intake of antidepressant medication is linked to an elevated incidence of premature delivery and birth complications

Teratogenic Substances (cont)

	Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, naproxen, and aspirin, can cause serious blood flow problems in the baby if used during the last 3 months of pregnancy (after 28 weeks)
illegal	babies born to users of cocaine, heroin, or methadone during pregnancy are at risk for prematurity, low birth weight, physical defects, breathing difficulties, and death
Tobacco	an estimated 14% of U.S women smoke during pregnancy. Effects of smoking during pregnancy include low birth weight and increased chances of miscarriage, prematurity, blood vessel abnormalities, and asthma and cancer later in childhood.
	"passive smoking" is also related to low birth weight, infant death, and possible attention, learning, and behavioral problems

Teratogenic Substances (cont)

Alcohol	**Fetal Alcohol Spectrum Disorder (FASD)**	refers to the range of physical, mental, and behavioral outcomes caused by prenatal alcohol exposure. Children with FASD are given one of three diagnoses:
	(1) Fetal Alcohol Syndrome (FAS)	slow physical growth, three facial abnormalities (short eyelid openings; a thin upper lip; a smooth or flattened philtrum, or indentation running from the bottom of the nose to the center of the upper lip), and brain injury; typically occurs when a woman drinks heavily throughout pregnancy
	(2) Partial Fetal Alcohol Syndrome (p-FAS)	two of the three facial abnormalities and brain injury. Mothers of children with p-FAS generally drank alcohol in smaller quantities, and children's defects vary with the timing and length of alcohol exposure.
	(3) Alcohol-related neurodevelopmental disorder (ARND)	at least three areas of mental functioning are impaired, despite typical physical growth and absence of facial abnormalities.

Teratogenic Substances (cont)

Radiation		exposure can cause miscarriage, an underdeveloped brain, physical deformities, and slow physical growth
Environmental Pollution		high levels of prenatal mercury, lead, PCBs exposure are all teratogenic and may produce multiple cognitive and physical developmental problems. Pregnant women should avoid eating swordfish, tuna, and shark which all have mercury. Air pollution can reduce infants head size, low birth weight, infant death, impaired immune system, and respiratory illnesses
Infectious Diseases	Rubella (measles)	can cause a wide variety of defects, including organ damage (especially in embryonic period),
	Human Immunodeficiency Virus (HIV)	untreated pregnant women with HIV can lead to acquired immune deficiency syndrome (AIDS) and pass the deadly virus to the developing organism

-The more alcohol a pregnant woman consumes, the poorer the child's motor coordination, speed of information processing, reasoning, and intelligence and achievement test scores during the preschool and school years.

Other Maternal Factors in Prenatal Development

Nutrition		a healthy diet ensures the health of the mother and baby.
	Malnutrition	cause serious damage to the baby's central nervous system and can effect the functioning of the liver, kidneys, pancreas, and other organs. Vitamin–mineral enrichment is crucial such as iron and folic acid supplements to prevent iron deficiency and other things
Emotional Stress		is intense anxiety during pregnancy, especially during the first two trimesters, is associated with miscarriage, prematurity, low birth weight, and colic
Rh Factor Incompatibility		occurs when a mother is Rh-negative (lacks Rh blood protein) and the infant inherits the Rh-positive blood type from the father. Vaccines can prevent Rh compatibility. If Rh compatibility does not occur, it can result in mental retardation, miscarriage, heart damage, and infant death
Age		

Other Maternal Factors in Prenatal Development (cont)

	Maternal Age	women who delay child bearing until their thirties or forties face an increased risk of infertility, miscarriage, and babies born with chromosomal defects.
Lack of Prenatal Care		While a teenager is physically capable of supporting a pregnancy, higher rates of problems seen in infants born to teenagers are related to the lack of access to medical care, stress, poor nutrition, and health problems associated with poverty.

Prenatal malnutrition is highest in poverty-stricken regions

In The Womb Video (on test)

-How it begins:
-during ejaculation, a mature healthy man expels up to 500 million sperm inside a
woman's vagina.
-Each sperm carries the fathers genetic code
-the quality of the sperm depends on the mans lifestyle. If you avoid smoking, excessive alcohol, hot baths, even tight underwear—he will produce stronger, healthier sperm. Coffee stimulates sperm to swim further, faster and harder
-it's a slow journey for the sperm, the smallest cell in the human body. They travel 1/10 of an inch per minute and there are hurdles at every turn
-from the vagina they pass through the cervix up into uterus and into the fallopian tube where the womans egg—the largest cell in the body—awaits
-each month, a womans ovaries release 1 egg that contain her own genetic code. She made the eggs while she was still a fetus herself, inside her own mothers womb. They have been kept in storage ever since—through childhood, adolescence, and adulthood, ready to burst into life
-The journey is so long and arduous for the sperm, that only a handful survive.
-may take up to 10 hours before the actual moment of conception
-the first sperm to reach the egg are the strongest and fittest
-the first to burrow its head through the eggs surface will be the winner

In The Womb Video (on test) (cont)

-there are no prizes for coming in second, the instant one sperm enters the egg, it triggers a change and the eggs membrane, making it impenetrable to all other sperm which all die off within a week
-once within the egg wall, the sperms nucleus is drawn towards the eggs and the two cells gradually and gracefully become one—this is the moment of conception, when an individuals unique set of DNA is created, a human signature that never existed before and will never be repeated
-the genetic code is stored in chromosomes—23 from mom, 23 from dad
-each chromosome is made up of a tightly coiled strand of DNA—molecule shaped like a double helix—carries our genetic code
-each microscopic chromosome contains over 6 feet of DNA
-a pattern of chemical codes creates DNA and holds the key to our uniqueness—our genes
-it takes between 20,000-25,000 genes to make a human
-We all have a complete set from each of our parents, deep in the nucleus of every cell in our bodies
-our genes are a set of instructions that tell us to become a human rather than a fish or tree. As well as deciding exactly what kind of person we will be
the sex of the child is determined by the father
-the 23rd pair of chromosomes has the specific job for determining the sex
-Soon after fertilization, the egg begins its journey travelling along the fallopian tube towards the uterus

Day 1 After Fertilization

egg divides for the first time and every cell in the body will need its own copy of the genetic blueprint

the chromosomes reproduce first, making an identical copy of the entire genetic code. When the two sets of chromosomes part, the nucleus splits into two and the cell divides. This division process continues as the clump of cells travel down the fallopian tube

4 or 5 Days After Fertilization

the tiny ball called a blastocyst has grown to around 100 cells and begins to separate into two sets

the outer ring of cells become the placenta--the life support system. While the inner circle will become the embryo

at this stage, the inner cells are known as stem cells. Stem cells have the capacity to turn into any one of over 200 different types of cells and grow to become any part of the body

Week 1 After Fertilization

The blastocyst reaches the end of the fallopian tube and arrives in the uterus--a haven for the next 9 months

until the mother misses a menstrual cycle, the mother may not even realize she's pregnant

Week 2

The embryo is now starting to take shape

the embryonic ball of cells are no bigger than a pinhead, folds in on itself to form a long tube. The top of the tube will grow into the head and the trunk of the body stretches down below

at day 15 nerve cells begin to form the brain as well as in the spinal column, which is exposed and totally unprotected by either skin or bone

The mother's blood volume may increase by up to 50% to cope with the extra demand for oxygen from the parasitic growth within her womb

Once the embryo embeds itself in the uterus, it starts to draw from the mothers bloodstream--all it needs to grow

Week 3

One of the first organs to form is the heart

a single cell within the heart moves. This tiny movement sparks a chain reaction and other cells in the cluster pick up the rhythm and beat in perfect unison. New cells divide, dance to the same beat and grow to form the embryos heart

the muscle cells of the heart are preprogrammed to contract. Later on when the NS is more developed, the brain will carefully control the rate of contraction, keeping it beating steadily and pumping for the rest of the childs life

without a heart, theres no way to deliver the food and oxygen the embryo needs to flourish

with the heart pumping, primitive blood cells start to circulate in the fetus through veins. The blood cells bring wital supplies of oxygen and nutrients to fuel the phenomenal growth over the next 8 months

Week 4 + 5

the embryo is no bigger than a kidney bean and is growing by about 1/10 of a centimeter everyday

black dots on the head are the beginnings of eyes. The miniature single chambered heart beats 80 times per minute and gets faster everyday

emerging buds along her body will into arms and legs

Week 4 + 5 (cont)

plates of tissue growing in from four sides create the face. The top sections grows down to make the forehead and nose. The cheeks fold in from the sides and join to form the top lip. If the sides don't join up properly, the baby will develop a cleft palate and may need corrective surgery after birth

even in adulthood, we bear a clear mark from the seam, the vertical groove between the mouth and nose called the philtrum

Just 1.5% of our genes makes us human, we share 98.5% of our DNA with chimpanzees. 3⁄4 with dogs, 1⁄2 with fruit flies, and 1⁄3 with daffodils

Week 6 + 7

fetus is almost an inch long

just black dots a few days ago, are eyes that are glassy, sightless domes with no eyelids set widely apart

the head is still massive compared to the body, even at birth the head will be a quarter of the body length and the rest of the body wont catch up with the head until adolescence

Week 8

embryo looks more like a tiny human and becomes known as a fetus

Until now, the embryo has been dependent one the nutrients she could extract from her yolk sac--a floating balloon connected to the base of the umbilical cord. A human yolk sac is used briefly and then it vanishes. It is believed that for the first few weeks it generates nutrients and blood cells for the embryo

2 Months (Week 9)

the yolk sac becomes redundant and shrivels away. The crucial job of feeding and nurturing the fetus is completely taken over by the placenta, which is embedded into the wall of the uterus at the end of the umbilical cord. It provides nutrients while filtering out waste

the placenta is the fetus's life support system during her time in the womb. Its a network of very fine blood vessels reaching into the wall of the uterus. Like the roots of a tree, sucking nutrients from the soil, it extracts everything th fetus needs from the mothers bloodstream--food, oxygen, water--and it filters it before passing it into the fetus's bloodstream

2 Months (Week 9) (cont)

blood enriched by the mothers diet, travels through the umbilical cord into the fetal arteries. Everything the fetus doesnt need--all the waste products--are siphoned out by the placenta and passed back into the mothers bloodstream

The placenta also filters out many harmful substances that may be in the mothers bloodstream and could damage the fetus, but it cant stop everything and the mother has to be careful with things like prescription drugs, alcohol, nicotine, which will pass directly to the fetus

Some pregnant mothers have a instinctive reaction to avoid food or drink that could be harmful to the fetus. They may be revolted by the smell of alcohol or seafood, meat, or mushrooms

the nervous system is developing fast, spreading connections throughout the body. The nerves may only extend from the muscles of the leg, for example, back to the spinal cord

the connection of the brain is still growing, so the brain isnt controlling the fetuses movements yet and are still involuntary reflex spasms

the heart isnt controlled by the brain yet, either. It marches to its own beat and its been gaining speed since it twitched to life in the 3rd week. Now pumps as fast as it will ever go, 157 beats every minute--an adult normal heart beat is 70-80 beats. After this peak, the heart rate will decrease as the heart, along with the rest of the body gradually comes under the brains control

The fetus begins to twitch. Movement plays a crucial role in stimulating the growth of muscles and strengthening joints

Week 10

three months have passed since conception and the first ultrasound scan can be done. Ultrasound scans that peer into the womb have revolutionized our understanding of fetal development and care for the mother. The 1st scan can also establish a more acurate due date based on the fetuses size, instead of guessing off the mothers last menstrual period

professor Stuart Campbell of the create health clinic in London is one of the worlds leading experts in obstetrics. He is a world renown pioneer of these new scans and is responsible for taking these incredible images

Week 10 (cont)

pictures are produced by sending ultra high frequency sound waves, far too high for us to hear, from the probe into the body of the mother. The waves penetrate through internal tissue, passing easily through the amniotic fluid, but bounce back strongly off solids, like bone. The reflected waves are collected to produce an internal image similar to X-ray, but without the danger. The scans arent known to cause any harm to the fetus

inside the womb, the fetus lives in fluid--even the longs are filled with fluid and the ultrasound prudces a moving image that revels important information about the health and development of the fetus

development of 3D scans and 3D scans that move in real time, which are 4D scans. Obstetricians can directly observe how the fetus grows, behaves, reacts to stimulation, and how its reflexes help to prepare it for birth and for survival outside the womb. 4D scans can scans embryos up to 6 weeks in the womb. This scan gives the first opportunity to determine if you are pregnant with one or two or more babies. Multiple births run in families (hereditary)

Identical twins are formed when an egg splits in two. They share identical DNA and could even share the same placenta. But only 1% of the time share an amniotic sac

If two eggs are released and fertilized at the same time they are fraternal twins and don't share identical DNA. They are separated in the womb, each living in its own amniotic sac and have separate placentas. They have a slightly early birth

Week 11

the building blocks to the baby's first steps are present after just 11 weeks in the womb

scans show 11 and 12 week old fetuses kicking and pushing out their legs in what is known as the stepping reflex. A reflex action is a preprogram biological impulse. When her feet touch the base of the uterus, the nervous system triggers an automatic muscle reaction in the legs

theres so much space in the uterus the fetus bounces and leaps around using the wall of the womb like a trampoline

the period from six to 11 weeks has seen the most dramatic transf-ormation of the entire pregnancy with the fetus undergoing a metemorphosis and growing nearly 5 times bigger in a five week burst

Week 11 (cont)

over 200 types of cells have been made muscles and nerves are twitching. Theres a liver, 2 kidneys, and a stomach no bigger than a grain of rice. All organs of a human baby have formed and its still less than 3 inches long

Week 12

after 12 weeks, the fetus enters the 2nd trimester, the middle 3 months of pregnancy

theres less risk of a miscarriage, which are most common in the 1st three months when new cells are developing, an imbalance in the immune system, stress, or if the mother has previously given birth to a boy could all increase the risk

only 50% of fertilized eggs survive all the way through pregnancy

in most miscarriages, occurring in the 1st trimester, the mother is unaware of what has happened, and may mistake it as a heavy period

as they develop, male and female fetuses have identical genitals, both having a protuberance, which for boys will become a penis and for girls a clitoris.

the only difference is that they stick at different angles. Looking at an ultrasound, an expert might guess the sex of this baby based on the angle, but theres a few more weeks before there is a clear difference between male and female genitals. But in each case, the sex organs are already hard at work. For a male, the testicles are producing testosterone and the ovaries of a female are making her own supply of eggs

4 Months

the fetus is still running on reflexes, but big places are taking place. The nervous system is up and running and movements are increa-singly being controlled by her brain

at 5.5 inches long, the fetus is much more mobile now, muscles are flexing, fingers and toes are separate and define, and bones are hardening

hands develop before the feet because they are going to be used first once the baby is born or because they are important sensory organs develop at the same time all the other senses are beginning to form

the eyes have grown closer together, giving the fetus a more human look

4 Months (cont)

The CNS extends its connections from the brain to most parts of the body, allowing the brain to gradually establish total control. The heart is no longer beating spontaneously and spasmodically, instead, the brain regulates the muscles and keeps them pumping blood at a steady 140 to 150 beats per minute

using a doppler probe, its now possible to hear what a babies heart sounds like

as the NS extends throughout the fetus, so does the capacity to respond to a stimulus, becoming sensitive to touch. If prodded through the mother's abdomen, the fetus is likely to squirm

from 4 months on, the fetus makes a lot of intricate movements. The fetus can then flex and twist their extremities--fingers, wrists, legs, and toes

The fetus begins to develop an awareness of the space around her called proprioception, the unconscious sense of our bodys place in space that helps the fetus interact with their environment

sensors give constant feedback to the brain and the movement can then be refined and gradually perfected

the eyes now in there correct position are are generally thought to be fused shut until 24 weeks, but 4D scans has revealed some fetuses opening their eyes as early as 18 weeks. Eyes opening as the first sign of the blinking reflex, although they cant necessarily see

Importance of Prenatal Care

Weight Gain	eat a well-balanced diet and take vitamin-mineral supplements both prior and during pregnancy. Gain 25 to 30 pounds gradually. keep physically fit through moderate exercise	being underweight before pregnancy may give birth to a low weight

Importance of Prenatal Care (cont)

		being obese is also a concern because women are at an increased risk of pre-eclampsia, gestational diabetes, cesarean delivery, and failure to initiate breastfeeding
Blood Pressure + Urine Chemistry	hospitalization, bed rest, and drugs can lower blood pressure if needed	monitored for evidence of sugar and diabetes
Vaccines		should be administered before getting pregnant
Illegal Drug Use		should be discussed by health care provider
Physical Abuse		By husband or partner is an important issue to be questioned by healthcare provider
Prenatal Counseling		may be provided by physician, nurse, nurse practitioner, a midwife or doula

This is an opportunity for a health care provider to discuss a variety of health and safety topics with the mother. Such as injury prevention, genetic screening, infant care, and domestic violence
-Monitor general health: weight gain, capacity of uterus and cervix to support fetus, growth of fetus
-treat complications: diabetes, preeclampsia

Stages of Childbirth

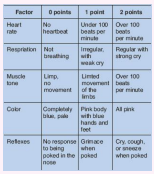
Dilation and Effacement of the Cervix	lasts an average of 12 to 14 hours with initial birth and 4-6 hours for those with later births. This period causes the cervix to widen and thin, firing a channel to the birth canal
Delivery of the Baby	shorter period lasting from 50 minutes to 10 minutes for subsequent births. Stronger muscle contraction and mother urge to push force the baby down and out
Delivery of the Placenta	follows 5 to 10 minutes after delivery of baby

Baby's Adaption to Labor and Delivery

High Levels of Stress Hormones:	help baby withstand oxygen deprivation by sending a rich supply of blood to the brain and heart
	prepare baby to breathe by causing the lungs to absorb any remaining fluid and by expanding the bronchial tubes
	arouse infant into alertness/awake

Average baby is 20 inches long and 71/2 pounds in weight; boys are slightly longer and heavier than girls
The head is large in comparison to the trunk and legs, which are short and bowed
The round faces, chubby cheeks, large foreheads, and big eyes of newborns make adults feel like picking them up and cuddling them

The Apgar Scale



Factor	0 points	1 point	2 points
Heart rate	No heartbeat	Under 100 beats per minute	Over 100 beats per minute
Respiration	Not breathing	Irregular, with weak cry	Regular with strong cry
Muscle tone	Limp, no movement	Limited movement of the limbs	Over 100 beats per minute
Color	Completely blue, pale	Pink body with blue hands and feet	All pink
Reflexes	No response to being poked in the nose	Grimace when poked	Cry, cough, or sneeze when poked

Color= Appearance, heart rate= Pulse, reflex irritability= Grimace, muscle tone= Activity, respiratory effort= Respiration.
A rating of 0, 1, or 2 on each of five characteristics is made at 1 minute and again at 5 minutes. A combined score of 7 or better= infant is in good physical condition. A score between 4 and 6= baby needs assistance in establishing breathing and other vital signs. A score 3 or below= infant is in serious danger and requires emergency medical attention

Preterm and Small-for-Date Infants

Preterm	born several weeks or more (3 or more weeks) before their due date
	weight may be appropriate for length of pregnancy
	appearance and behavior: tiny, sleepy, and unresponsive
Small--to-Date	may be either preterm or full-term
	below expected weight for length of pregnancy
	likely to suffer from neurological impairments that permanently weaken their capacity to manage stress; heightening their susceptibility to later physical and psychological health problems

research reveals that distressed and emotionally reactive preterm infants are especially susceptible to the effects of parenting quality, how well preterm infants develop has a great deal to do with the parent-child relationship

Greatest predictor of survival and healthy development of newborn is the birth weight. Premature babies weigh less than 51/2 pounds and are tiny, sleepy, and unresponsive
1 in 13 American infants is born underweight. The appearance and behavior can lead to parents to be less sensitive in caring for them. Highest among poverty-stricken women

Interventions for Preterm Infants

Temperature-Controlled Isolette (enclosed bed)

Special Stimulation		promotes growth and alertness, involving motion, touch, or sound
	gentle rocking	promotes faster weight gain, more predic-table sleep patterns, and greater alertness
	visual or auditory stimulation	

Interventions for Preterm Infants (cont)

touch (Kangaroo care-skin to skin)	Improves oxygenation of baby's body, temperature regulation, sleep, breastfeeding, alertness, and infant survival. Mothers and fathers who practice this contact with their infants find their confidence in car and affection for their infant rises with each exposure

Pregnancy Length and Infant Survival / Disability

Babies at greater risk are African American and Native American who are nearly twice as likely as white infants to die in the first year of life.
Widespread poverty leads to low birth-weight infants which is the second leading cause of infant death.
With the new Affordable Care Act, it is hoped that this can be improved
Guaranteed paid prenatal visits and parent counseling for care of new borns is provided in most other nations

Infant mortality—the number of deaths in the first year of life per 1,000 live births
Neonatal mortality, the rate of death within the first month of life, accounts for 67 percent of the U.S. infant death rate. Two factors are largely responsible. The first is serious physical defects, most of which cannot be prevented. The percentage of babies born with physical defects is about the same in all ethnic and income groups. The second is low birth weight, which is largely preventable

Reflexes

NAME	HOW TO GET REFLEX RESPONSE	WHEN REFLEXES DISAPPEAR
Eye Blink	automatic response	never

Reflexes (cont)

Rooting	when an infants cheek or side of mouth is stroked the head will turn towards it, and the infants mouth will open in an attempt to suck. This helps the baby find the food source when feeding	about 4 months of age
Sucking	when something touches the top of the infants mouth the infant will begin to suck	about 4 months of age
Moro (startle)	when the infant hears a sudden loud noise or experiences unexpected movement, the infant will extend the arms with palms up, and move the arms back to the body. Sometime crying is noted afterwards	about 6 months of age
Palmar Grasp	when placing a finger or stroking the inside of the infants palm, the hand will close around it	about 4-6 months of age
Plantar Grasp	when a finger is placed under the toes, the toe will curl	about 9 months-1 year of age
Tonic Neck	when infants head is turned to a particular side, the leg and arm on that side will extend, while the leg and arm on the opposite side will flex	about 4 months of age
Stepping	when holding the infant upright with legs and feet touching a surface, the infant will move the legs like taking steps or walking	about 3-4 months of age

Reflexes (cont)

Babinski	when the bottom of the foot is stroked from the heal upward along the outward part of the foot. the big toe dorsiflexes and the other toes fan or spread out	about 1 year of age
Crawling	when the infant is placed on the stomach and pressure is applied to the sole of the foot, the infant will attempt to push against the hand and move the arms and legs in a crawling like motion	few weeks to months after birth

neonatal reflexes are involuntary reactions to a particular stimulation
Reflexes too strong, too weak, or absent may indicate neurological abnormalities

States of Arousal

Non-Rapid-Eye-Movement (NREM) Sleep	regular sleep, no eye movement, 8-9 hours, regular breathing
Rapid-Eye-Movement (REM) Sleep	irregular sleep, occasional stirring, facial grimaces, irregular breathing, 8-9 hours
Drowsiness	infant is either falling asleep or waking up
Quiet Alertness	body inactive, eyes open attentive, 2-3 hours
Waking Activity and Crying	1-4 hours, breathing irregular

Brain damage or birth trauma infants often have disturbed NREM / REM sleep patterns
Can lead to disorganized behavior and learning difficulties

Soothing A Crying Baby

Talk softly or play rhythmic sounds

Offer pacifier

Massage baby's body

Swaddle

Hold on shoulder, rock or walk

Go for car ride or swing in cradle

Combine methods

Let them cry for short time

Colic is a term for persistent crying and tends to be high pitched or harsh sounding. Cause is unknown but may be due to unpleasant stimuli. Usually ends between 3 and 6 months of age

Newborn Sense of Touch

Sensitive to touch:	used to investigate their world. Helps stimulate early physical growth and emotional development	around the mouth
		on palms and soles
Severe Pain		overwhelms nervous system with stress hormones leading to heightened pain sensitivity and other problems
		can be relieved with local anesthesia, sugar solution, or physical touch

Both sensitivity to touch and pain are present at birth

Newborn Senses of Taste and Smell

have a preference for sweet tastes at birth

can rapidly learn to like new tastes

have odor preferences at birth

can locate odors and identify mother by smell from birth

taste is especially sensitive to the sweet taste of breast milk

Not until 4 months do babies prefer a salty taste to plain water, a change that may prepare them to accept solid foods

Newborn Sense of Hearing

can hear a wide variety of sounds	
prefer complex sounds (voices, noises) to pure tones	
can distinguish between a variety of sound patterns when only a few days old	
listen longer to human speech than to non speech sounds	
can detect the sounds of any human language	

Newborn Sense of Vision

last and least developed sense at birth	
limited visual capacity	
actively explore environments:	scan for interesting sights
	track moving objects
not yet good at discriminating colors	

The optic nerve development will not be adult-like for several years. Fine visual discrimination is limited. Images are blurred. Infant is not able to distinguish colors at this stage

New Family Adjustments

Hormones that facilitate caregiving:	oxytocin	stimulates uterine contra-ctions
	prolactin	stimulate milk production
	estrogens	sex hormones
Hormonal effects may depend on experience		
Challenges of early weeks:		new roles and responsib-ilities
		changed schedule with nightly feedings, etc.

Toward the end of pregnancy, mothers begin producing higher levels of the hormone oxytocin
Fathers and mothers have hormonal changes around the time of birth. They are induced by contact with the mother and the baby, can give positive reaction to newborn and paternal care giving.
This can be a time for increased stress and changes in responsib-ilities for both parents

Terms To Know

Age of Viability	the point at which the baby can first survive if born early, occurring between 22 and 26 weeks
REM Sleep	an irregular sleep state in which brain-wave activity is similar to that of the waking state
NREM Sleep	a "regular" sleep state during which the body is almost motionless and heart rate, breathing, and brain-wave activity are slow and even
Infant Capacity (sensory development)	crucial for survival and for evoking adult attention and care. Reflexes, states of arousal, touch, taste and smell, vision, hearing
Infant Reflexes	rooting, sucking, stepping, moro, palmar and plantar grasp, tonic neck, babinski
Rh Factor Incompatibility	A condition that arises when the Rh protein is present in the fetus's blood but not in the mother's, causing the mother to build up antibodies. If these enter the fetus's system, they destroy red blood cells, reducing the oxygen supply to organs and tissues. Intellectual disability, miscarriage, heart damage, and infant death can occur

Terms To Know (cont)

Apgar Scale	A rating system used to assess a newborn baby's physical condition immediately after birth on the basis of five characteristics: heart rate, respiratory effort, reflex irritability, muscle tone, and color
Teratogens	Any environmental agent that causes damage during the prenatal period
Preterm Infants	Infants born several weeks or more before their due date
Fetal Alcohol Syndrome (FAS)	The most severe form of fetal alcohol spectrum disorder, distinguished by slow physical growth, facial abnormalities, and brain injury. Usually affects children whose mothers drank heavily throughout pregnancy

5 Months (Week 24)

the fetus is halfway through its journey towards birth

fetus has grown to 7 inches long and showing an incredible level of detail, including having her own finger prints

mothers have a more detailed scan, surveying the anatomy of the fetus and measures the rate of growth since the last scan

research shows that seeing the developing face of the fetus while inside the womb can be an intense bonding experience

is the earliest a baby can be born and still have a good chance of surviving. Few babies live when born as young as 22 weeks but any baby born prematurely faces an increased risk of brain damage, developing disabilities or learning difficulties. The big problem is the small lungs which are too under developed to take enough oxygen into the bloodstream

Week 25

The eyes grow intricate lashes

Babies of Asian or African descent are usually born with dark brown or dark grey eyes that mature to deep brown or black or Caucasian baby almost always has blue eyes in the womb, even if they change to green or brown afterbirth

The fetus's most developed sense is hearing

Week 26

the mothers increase in heart rate and blood pressure are easily pass through the placenta and have a direct impact on the baby.

the mother can feel her baby move every day, sometimes she may feel the regular twitch of her baby's hiccups

6 Months

the end of the 2nd trimester

everything is developing and functioning in the full grown baby. All is there, just very small and immature

the mother becomes more and more aware of movement made by the fetus. Her abdomen continues to grow and likely to be feeling better now than at any time throughout her pregnancy, very energetic and active. She has passed the effects of morning sickness and the fetus isnt big enough enough to cause any discomfort that she will feel at the end of her pregnancy

This is the time she receives her first stimulation from the world as her senses flicker to life. Most of the sense organs, ears, nose, taste buds, and the nerves that respond to touch are now mature. Her brain is being bombarded by signals from these sensory cells and she must begin to interpret this overload of sensation.

The senses will be her key to the world, allowing her to develop a sense of self, interact with others, to explore and to learn

the fetus can open and close its eyes to help them develop the blinking reflex, that stays with us for life to protect our eyes from foreign objects, keep them moist, and shield them from bright light

7 Months (Week 28-32)

the baby is over two-thirds of the way through her time in the womb and his gaining weight fast as she lays down a layer of fat under her scan, our senses are buzzing and her cerebral cortex has matured enough to consciousness

7 Months (Week 28-32) (cont)

the nervous system will become as advanced as a newborn baby and becoming aware of the world around her

the brain is beginning to create memory

the fetus is familiar with its rhythms cyclically, with this constant exposure, it absorbs enough of these patterns to recognize and even respond to it. Fast music stimulates and excites music that is closest to the natural sounds and rhythms of the human voice, such as classical choral music, has the sedating, calming effect. If the fetus hears the same musing over and over again, it may even be able to remember it

8 Months (Week 33)

The fetus may recognize a particular piece of music and even jump in time

Where once it seemed that the mental development of a baby began at birth. Now, it appears that birth could be a relatively insignificant event in developmental terms

One of the many things revealed by the 4D scans is the fact that babies have rapid eye movement sleep. This is a period of sleep when the eyes flicker around behind the islets later in life. This is an indication of dreaming, gentle flicker of an I could be a sign that the fetus still with a month to go before being born, is already dreamy though was so little life experience.

the brain has grown approximately 100 billion neurons with 100 trillion connections

The fetus can survive at foreign anytime from about 35 weeks without much medical help

The fetus is also a considerable drain on her mother, and putting on fat is using up more resources than the mother can provide.

only 5% of babies are born on their due date. The rest can emerge any time within two weeks of their expected arrival. The mother's kept guessing and waiting for signs, the first contraction of the uterus or the breaking water as the amniotic sac ruptures

9 Months + Labor

When the lungs are mature, they secrete a protein into the amniotic fluid which alters the placenta is production of hormones. It slows the release of progesterone and triggers the release of a new hormone, oxytocin, which initiates the contractions of the uterine wall. Oxytocin also inhibits memory and may play a role in helping women to forget the pain of birth and bond with their new babies

9 Months + Labor (cont)

During the first stage of labor, the baby's head is locked in the bottom of the uterus. It is bearing down on the cervix, the barrier between the uterus and the vagina. The last thing to pass through the cervix was a tiny sperm 38 weeks ago. Now, cervix must stretched ten centimeters wide to allow the baby's head, largest part to pass through

Labour is also painful and stressful for the baby

Squashing of the umbilical cord can easily constrict the supply of oxygen to help the baby coef, her body releases large quantities of adrenaline to keep her heart pumping fast enough

Adrenalin also helps prepare the lungs for the lifetime of work they're about to begin once the cervix is fully opened, the second stage of labor, the actual delivery begins >> Each contraction of the uterus, the baby has pushed further through the cervix and vagina until eventually her head is just visible

As soon as the baby is delivered, the lungs drain of fluid and air rushes in, expanding the air sacs that in an instant begin extracting oxygen to keep the baby alive

in the third stage of labor, the placenta detaches from the uterine wall and follows the baby out through the vagina

The sweet smile seen inside the womb is gone now as the baby is thrust into a noisy, bright world and starts to feel uncomfortable sensations like cold and hunger

The baby's smile won't be seen again until she's at least four weeks old. Each year around the world, about 130 million women go through the complex cycle of pregnancy and birth are increasingly sophisticated understanding of the process as drastically reduce the risks for both mother and baby