

A&P Key Terms

28 Development & Inheritance

Development & Inheritance

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4. Chapter: A&P Key Terms 28 Development & Inheritance

1. A&P Key Terms 28 Development & Inheritance Questions

| | |
|-----------------------------------|---|
| <u>acrosomal reaction</u> | release of digestive enzymes by sperm that enables them to burrow through the corona radiata and penetrate the zona pellucida of an oocyte prior to fertilization |
| <u>acrosome</u> | cap-like vesicle located at the anterior-most region of a sperm that is rich with lysosomal enzymes capable of digesting the protective layers surrounding the oocyte |
| <u>afterbirth</u> | third stage of childbirth in which the placenta and associated fetal membranes are expelled |
| <u>allantois</u> | finger-like outpocketing of yolk sac forms the primitive excretory duct of the embryo; precursor to the urinary bladder |
| <u>allele</u> | alternative forms of a gene that occupy a specific locus on a specific gene |
| <u>amnion</u> | transparent membranous sac that encloses the developing fetus and fills with amniotic fluid |
| <u>amniotic cavity</u> | cavity that opens up between the inner cell mass and the trophoblast; develops into amnion |
| <u>autosomal chromosome</u> | in humans, the 22 pairs of chromosomes that are not the sex chromosomes (XX or XY) |
| <u>autosomal dominant</u> | pattern of dominant inheritance that corresponds to a gene on one of the 22 autosomal chromosomes |
| <u>autosomal recessive</u> | pattern of recessive inheritance that corresponds to a gene on one of the 22 autosomal chromosomes |
| <u>Braxton Hicks contractions</u> | weak and irregular peristaltic contractions that can occur in the second and third trimesters; they do not indicate that childbirth is imminent |
| <u>blastocoel</u> | fluid-filled cavity of the blastocyst |
| <u>blastocyst</u> | term for the conceptus at the developmental stage that consists of about 100 cells shaped into an inner cell mass that is fated to become the embryo and an outer trophoblast that is fated to become the associated fetal membranes and placenta |
| <u>blastomere</u> | daughter cell of a cleavage |
| <u>brown adipose tissue</u> | highly vascularized fat tissue that is packed with mitochondria; these properties confer the ability to oxidize fatty acids to generate heat |

capacitation

process that occurs in the female reproductive tract in which sperm are prepared for fertilization; leads to increased motility and changes in their outer membrane that improve their ability to release enzymes capable of digesting an oocyte's outer layers

carrier

heterozygous individual who does not display symptoms of a recessive genetic disorder but can transmit the disorder to his or her offspring

chorion

membrane that develops from the syncytiotrophoblast, cytotrophoblast, and mesoderm; surrounds the embryo and forms the fetal portion of the placenta through the chorionic villi

chorionic membrane

precursor to the chorion; forms from extra-embryonic mesoderm cells

chorionic villi

projections of the chorionic membrane that burrow into the endometrium and develop into the placenta

cleavage

form of mitotic cell division in which the cell divides but the total volume remains unchanged; this process serves to produce smaller and smaller cells

codominance

pattern of inheritance that corresponds to the equal, distinct, and simultaneous expression of two different alleles

colostrum

thick, yellowish substance secreted from a mother's breasts in the first postpartum days; rich in immunoglobulins

conceptus

pre-implantation stage of a fertilized egg and its associated membranes

corona radiata

in an oocyte, a layer of granulosa cells that surrounds the oocyte and that must be penetrated by sperm before fertilization can occur

cortical reaction

following fertilization, the release of cortical granules from the oocyte's plasma membrane into the zona pellucida creating a fertilization membrane that prevents any further attachment or penetration of sperm; part of the slow block to polyspermy

dilation

first stage of childbirth, involving an increase in cervical diameter

dominant lethal

inheritance pattern in which individuals with one or two copies of a lethal allele do not survive in utero or have a shortened life span

| | |
|-------------------------------|--|
| <u>dominant</u> | describes a trait that is expressed both in homozygous and heterozygous form |
| <u>ductus arteriosus</u> | shunt in the pulmonary trunk that diverts oxygenated blood back to the aorta |
| <u>ductus venosus</u> | shunt that causes oxygenated blood to bypass the fetal liver on its way to the inferior vena cava |
| <u>ectoderm</u> | primary germ layer that develops into the central and peripheral nervous systems, sensory organs, epidermis, hair, and nails |
| <u>ectopic pregnancy</u> | implantation of an embryo outside of the uterus |
| <u>embryo</u> | developing human during weeks 3-8 |
| <u>embryonic folding</u> | process by which an embryo develops from a flat disc of cells to a three-dimensional shape resembling a cylinder |
| <u>endoderm</u> | primary germ layer that goes on to form the gastrointestinal tract, liver, pancreas, and lungs |
| <u>epiblast</u> | upper layer of cells of the embryonic disc that forms from the inner cell mass; gives rise to all three germ layers |
| <u>episiotomy</u> | incision made in the posterior vaginal wall and perineum that facilitates vaginal birth |
| <u>expulsion</u> | second stage of childbirth, during which the mother bears down with contractions; this stage ends in birth |
| <u>fertilization membrane</u> | impenetrable barrier that coats a nascent zygote; part of the slow block to polyspermy |
| <u>fertilization</u> | unification of genetic material from male and female haploid gametes |
| <u>fetus</u> | developing human during the time from the end of the embryonic period (week 9) to birth |
| <u>foramen ovale</u> | shunt that directly connects the right and left atria and helps divert oxygenated blood from the fetal pulmonary circuit |
| <u>foremilk</u> | watery, translucent breast milk that is secreted first during a feeding and is rich in lactose and protein; quenches the infant's thirst |

gastrulation

process of cell migration and differentiation into three primary germ layers following cleavage and implantation

genotype

complete genetic makeup of an individual

gestation

in human development, the period required for embryonic and fetal development in utero; pregnancy

heterozygous

having two different alleles for a given gene

hindmilk

opaque, creamy breast milk delivered toward the end of a feeding; rich in fat; satisfies the infant's appetite

homozygous

having two identical alleles for a given gene

human chorionic gonadotropin

(hCG) hormone that directs the corpus luteum to survive, enlarge, and continue producing progesterone and estrogen to suppress menses and secure an environment suitable for the developing embryo

hypoblast

lower layer of cells of the embryonic disc that extend into the blastocoel to form the yolk sac

implantation

process by which a blastocyst embeds itself in the uterine endometrium

incomplete dominance

pattern of inheritance in which a heterozygous genotype expresses a phenotype intermediate between dominant and recessive phenotypes

inner cell mass

cluster of cells within the blastocyst that is fated to become the embryo

involution

postpartum shrinkage of the uterus back to its pre-pregnancy volume

karyotype

systematic arrangement of images of chromosomes into homologous pairs

lactation

process by which milk is synthesized and secreted from the mammary glands of the postpartum female breast in response to sucking at the nipple

lanugo

silk-like hairs that coat the fetus; shed later in fetal development

let-down reflex

release of milk from the alveoli triggered by infant suckling

lightening

descent of the fetus lower into the pelvis in late pregnancy; also called 'dropping'

pregnancy; also called 'dropping'

lochia

postpartum vaginal discharge that begins as blood and ends as a whitish discharge; the end of lochia signals that the site of placental attachment has healed

meconium

fetal wastes consisting of ingested amniotic fluid, cellular debris, mucus, and bile

mesoderm

primary germ layer that becomes the skeleton, muscles, connective tissue, heart, blood vessels, and kidneys

morula

tightly packed sphere of blastomeres that has reached the uterus but has not yet implanted itself

mutation

change in the nucleotide sequence of DNA

neural fold

elevated edge of the neural groove

neural plate

thickened layer of neuroepithelium that runs longitudinally along the dorsal surface of an embryo and gives rise to nervous system tissue

neural tube

precursor to structures of the central nervous system, formed by the invagination and separation of neuroepithelium

neurulation

embryonic process that establishes the central nervous system

nonshivering thermogenesis

process of breaking down brown adipose tissue to produce heat in the absence of a shivering response

notochord

rod-shaped, mesoderm-derived structure that provides support for growing fetus

organogenesis

development of the rudimentary structures of all of an embryo's organs from the germ layers

Punnett square

grid used to display all possible combinations of alleles transmitted by parents to offspring and predict the mathematical probability of offspring inheriting a given genotype

parturition

childbirth

phenotype

physical or biochemical manifestation of the genotype; expression of the alleles

placenta previa

low placement of fetus within uterus causes placenta to partially or completely cover the opening of the cervix as it grows

the cervix as it grows

placenta

organ that forms during pregnancy to nourish the developing fetus; also regulates waste and gas exchange between mother and fetus

placentation

formation of the placenta; complete by weeks 14-16 of pregnancy

polyspermy

penetration of an oocyte by more than one sperm

primitive streak

indentation along the dorsal surface of the epiblast through which cells migrate to form the endoderm and mesoderm during gastrulation

prolactin

pituitary hormone that establishes and maintains the supply of breast milk; also important for the mobilization of maternal micronutrients for breast milk

quickening

fetal movements that are strong enough to be felt by the mother

recessive lethal

inheritance pattern in which individuals with two copies of a lethal allele do not survive in utero or have a shortened life span

recessive

describes a trait that is only expressed in homozygous form and is masked in heterozygous form sex chromosomes pair of chromosomes involved in sex determination; in males, the XY chromosomes; in females, the XX chromosomes

shunt

circulatory shortcut that diverts the flow of blood from one region to another

somite

one of the paired, repeating blocks of tissue located on either side of the notochord in the early embryo

syncytiotrophoblast

superficial cells of the trophoblast that fuse to form a multinucleated body that digests endometrial cells to firmly secure the blastocyst to the uterine wall

trait

variation of an expressed characteristic

trimester

division of the duration of a pregnancy into three 3-month terms

trophoblast

fluid-filled shell of squamous cells destined to become the chorionic villi, placenta, and associated fetal membranes

true labor

regular contractions that immediately precede childbirth; they do not abate with hydration or rest, and they become more frequent and powerful with time

umbilical cord

connection between the developing conceptus and the placenta; carries deoxygenated blood and wastes from the fetus and returns nutrients and oxygen from the mother

vernix caseosa

waxy, cheese-like substance that protects the delicate fetal skin until birth

X-linked dominant

pattern of dominant inheritance that corresponds to a gene on the X chromosome of the 23rd pair

X-linked recessive

pattern of recessive inheritance that corresponds to a gene on the X chromosome of the 23rd pair

X-linked

pattern of inheritance in which an allele is carried on the X chromosome of the 23rd pair

yolk sac

membrane associated with primitive circulation to the developing embryo; source of the first blood cells and germ cells and contributes to the umbilical cord structure

zona pellucida

thick, gel-like glycoprotein membrane that coats the oocyte and must be penetrated by sperm before fertilization can occur

zygote

fertilized egg; a diploid cell resulting from the fertilization of haploid gametes from the male and female lines
