Maret: Fertilization and Conception Chapter 3 and Genetics Chapter 4

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Required Video Summary Essay: Autism-what we know (and what we don't know yet) Wendy Chung

Wendy Chung is a pediatrician, geneticist, and a researcher, in the pursuit of obtaining additional and reliable information to what causes autism in children. She describes a thirteen-year-old boy named Justin, who is diagnosed with autism and does not have the ability to convey in conversations or express himself with words. As a non-verbal communicator, Justin utilizes an iPad, to impart his thoughts by tapping pictures on the touch screen tablet. Autism is diagnosed in one of eighty-eight children, mainly boys, and can present distinct challenges in children. Dr. Chung stressed the erroneous conception that vaccines generate autism. She stated the following, "Vaccines do not cause autism." She displayed a graph, apprising the termination of the ingredient thimerosal in vaccines in 1992, as it was believed the component was the source for autism. Statistics were shown of an escalation of 500 to 4000 children diagnosed with autism between 1993 and 2002. In addition, connections to the development of autism in children, is the advanced paternal and maternal age of the parents when conceiving a child, medications to treat epilepsy in mothers, such as valproic acid and exposure to chemicals can intensify the risk in the development of the fetal brain. Dr. Chung explained that genes can also play a part in the development of autism. She used the example of an organized set of 46 encyclopedias in comparison to human genes. If a volume book, or a paragraph or even a letter is missing, it is incomplete and derails its useful purpose. In the same matter, if a gene or genes are modified, it can obstruct with how the brain operates and impact human behavior. Dr. Chung informs how technology such as google glass, has helped children with autism to learn to communicate and methods of biomarkers eye contact and tracking of Ami Klin, help identify risks of autism in infants.

Maret: Fertilization and Conception Chapter 3

1. The male reproductive system embodies the external and internal organs that comprise the function of the urinary system and the reproduction system. The principal external reproductive organ is called the penis. The body of the penis has a tube-shaped design, with the potential to erect, when its tissues become filled or swelled with blood before sexual activity. The glans also called the head of the penis, is completely full of neural receptors that is sensitized, when it promptly responds to influences. The foreskin has loose layers of skin that can be eliminated through a surgical procedure called circumcision. Urine accumulated in the bladder is released through the urethra. Semen is egressed out of the testicles through the opening of the urethra. Both the semen and urine cannot pass through the urethral opening at the same time. The scrotum is similar in comparison to a baggy sac that dangles in back of the penis. The scrotum carries two independent testicles that provides accurate body temperature for the manufacturing of wholesome sperms. The major activity and responsibility of the testicles, also known as the testis, is to create and accumulate sperm in preparation to achieve fertilization. It is connected to the spermatic cord which have blood vessels, bundle of nerves, and secures the existence and purpose of the testicles. In addition, it produces testosterone, the male primary sex hormone. Inside the testicles, is a collection of coiled tubes named seminiferous tubules. The tubules are liable for the production of sperm cells through the action of spermatogenesis. The epididymis holds and accumulates sperm that is produced by the testicles and functions to bring sperm to full development. The Vas Deferens is a coiled tube that transports developed sperms to the urethra, in the process of ejecting semen. The seminal vesicles create seminal fluids, which contain fructose, amnio acids, and citric, that provides energy to the sperm and the ability to move.

3. Spermatogenesis is the origin development of sperm cells. It is located in the seminiferous tubules of the testis or testicles, where sperm cells commence their process by producing germ cells called spermatogonia. They possess forty-six healthy chromosomes which multiply to an arising amount of ninety-two chromosomes. A part of the ninety-two chromosomes is divided into two individual cells. After the first phase of sperm cell division or primary spermatocytes, the sperm cells spilt up again, carrying twenty-three chromosomes. This second phase of sperm cell division is called secondary spermatocytes. When the twenty-three chromosomes of the sperm unite with the twenty-three chromosomes of the ovum, they will create a new organism or individual that will include the blend of genetic characteristics.
It takes about seventy days for the testicles to create sperm. The tip of a sperm's head contains DNA, and is also called the acrosome, which capacitates the sperm to succeed into the ovum. The mid part of the sperm comprises of mitochondria that provides energy to the tail. This facilitates the sperm to swim or to mobilize. Sperms can face potential danger and develop abnormalities when the male does not pay attention to certain details. These details included wearing tight underwear or garments, excessive hot baths, and constantly exposed to increased levels of temperatures. Abnormal sperm can also be contributed through drugs, alcohol, smoking, environmental chemicals and stress. When a sperm cell is abnormal, it may distort of its original shape, by having two heads or tails. It loses its potential to swim and the sperm count is below the average. This is significant because it lowers the possibility to procreate or to have genetically healthy children.

5. In the pre-fertilization phase, the action of sexual activity is performed. Millions of sperm are released through ejaculation into the vagina. Sperms must overcome some obstacles such as the acidity of the vaginal fluid. Some sperms will expire inside the area of the vagina. Once some sperms pass through the vaginal territory, they mobilize into the territory of the cervix. The cervix is narrowly shaped, and its cervical mucus loses the thickness barrier, which increases the sperms to mobilize into the uterus and makes its way towards the fallopian tubes in search of an ovum. During ovulation, the ovary releases an ovum and will journey in the fallopian tube. Although millions of sperm may surround the ovum, trying to get inside the ovum, only one sperm is successful in penetrating the ovum. The author stated, “Out of 200 to 500 million sperm that start the race, there can potentially only be 1 winner.” (Maret 46). Once the successful sperm gets inside the ovum, the other sperms cannot. When the sperm and ovum unite, their DNA cells will merge together forming a new human being or zygote. The zygote becomes an embryo after twenty-four hours. The embryo is released from the fallopian tube, into the uterus and attaches to the uterine wall. This process is called implantation. Sometimes, depending on infertility circumstances, fertilization can occur in a laboratory inside a test tube or in a Petri dish. As the cells duplicate, it will produce specific cells to compose the functional systems of the human body.

8. Fragile X Syndrome is an inherited genetic disorder resulted by a gene mutation on chromosome X and can initiate autism. It causes intellectual disabilities in males and females. Particularly in males, some of the symptoms noted is the sticking out of the big ears and the size of the testicles are large. Most commonly, the males are intensely affected by this genetic disease than the females. Turner Syndrome is a chromosomal disorder that impacts females. A chromosome XX in a female is normal. But when an X is absent or partial missing it is considered abnormal. It creates abnormalities in the reproductive development in females. This involves the absence of menstruation and generates female infertility. Females with Turner Syndrome develop a short stature, broad chest, and a low hairline. In addition, the female's intellectual abilities are also impacted. Klinefelter syndrome is genetic condition when the males are born with extra chromosomes. A chromosome XY in a male is normal. But when additional copies of x's or y's are found on chromosome 23, it is abnormal. The symptoms of this syndrome are low testosterone, low sperm, small reproductive organs, enlarged breast tissue and around twenty-five percent of males, develop intellectual disabilities.

9. In 1866, British Physician John Langdon Down was the first to describe and introduce the genetic state of Down Syndrome. Down Syndrome is the condition of a genetic disorder created by the extra genetic material discovered on chromosome 21. The three types of Down Syndrome are Trisomy 21, Mosaicism, and Robertsonian translocation. The severity caused by Down Syndrome in an individual, are the noticeable differences in the facial and physical appearances. Other longevity seriousness generated by Down Syndrome, is the intellectual and learning disabilities, along with the developmental delays. In addition, individuals diagnosed with this genetic disorder, have an increased risk for medical health issues such as epilepsy, leukemia, Alzheimer's disease, and congenital heart disease. In 1910, American Physician James Herrick initiated his introduction of Sickle-cell Anemia. Sickle-cell disease is an inherited red blood cell group disorder. A group of red rounded blood cells are normal. But individuals with sickle cell, their red blood cells are shaped like a crescent moon, which is abnormal. The hemoglobin in the red blood cells is responsible to transport oxygen to all parts of the body. Because sickle cells demise prematurely, it creates a barrier in the blood vessels, causing the individual to feel fatigued, while causing damages to internal organs in the body. Although there is no medical cure, individuals diagnosed with sickle cell anemia are in constant need of blood transfusions and bone marrow transplants. During the 1800's, the British physician in ophthalmology, Warren Tay, and the American physician in neurology, Bernard Sachs, were the pioneers to discover and establish their investigations on Tay Sachs disease. The inherited disease is caused by gene mutation on chromosome 15 and is excessively among the Jewish descent. Although there is no medical cure, individuals prematurely demise before the age of five.

11. Genetic Counseling is the medical consultation about how genetic conditions are identified and how it may impact. With the analysis of the collection of your medical records along with the information of your family history, the necessary number of genetic screenings will be determined. Candidates encouraged to consult with a genetic counselor, are women over the age of thirty-five and men over the age of fifty-five. Couples that have difficulty in conceiving a child, are good candidates for genetic counseling. In addition, women who are diagnosed with the medical term “habitual aborters”, meaning that they have a medical history of miscarriages, should seek advisement. Genetic counseling is of great value especially when there is a family history of Sickle cell disease, Tay Sachs disease, and Down Syndrome along with other genetic disease disorders. Diseases that have no cure may cause premature death, demand expensive medical interventions for survival, and develop a permanent genetic status that can create an uncommon environment for the child and the parents. Through genetic counseling, an increased understanding of the genetic condition is provided. It will help to ease the anxiety of the family as several discussions are made, to cope with the risks and potential outcome results.

References

Maret, Stephen. *Introduction to Prenatal Psychology.* Second Edition. ISBN#9780578089980. Pps. 38-45.46. 47-48.

https://www.youtube.com/watch?v=wKlMcLTqRLs&t=934s