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MATRIC NUMBER: 18/MHS02/092

LEVEL: 200LVL

DEPARTMENT: NURSING SCIENCE

COURSE: PHS 212 (PHYSIOLOGY)

## **QUESTIONS**

1. Write a short note on Implantation

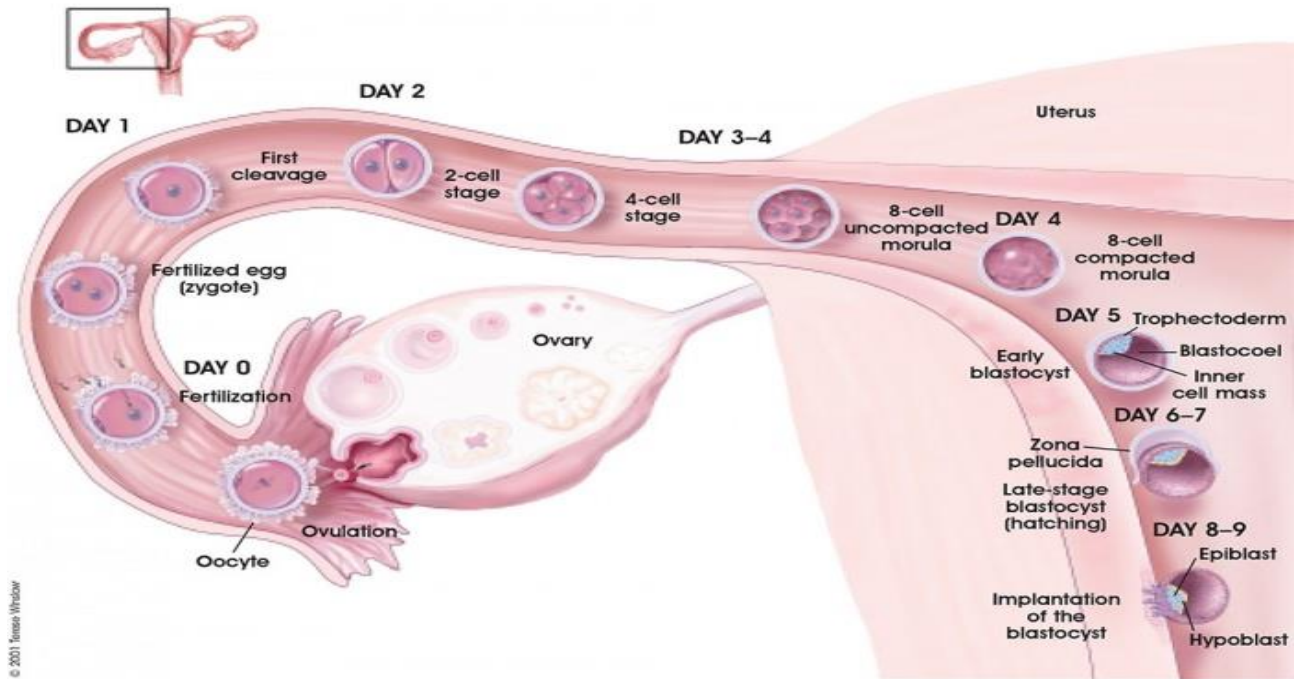
## **ANSWERS**

### **IMPLANTATION**

Implantation is the window of time during early pregnancy when a cluster of rapidly dividing cells — called a blastocyst — makes its way down the fallopian tube and burrows deep into the lining of the uterus. The lining of the uterus (endometrium) prepares for the developing blastocyst to attach to it via many internal changes. Without these changes implantation will not occur, and the embryo sloughs off during menstruation.

Before embryogenesis begins, the ovary releases an unfertilized egg cell, called an oocyte, which then travels down the fallopian tube. The egg is enveloped in an extracellular matrix called the zona pellucida. Sperm can fertilize the egg in the zona pellucida (ZP), which prevents the fertilized egg, called a zygote, from adhering to the wall of the fallopian tube. If the zygote implants in any area besides the uterus, the result is an ectopic pregnancy. This condition prevents the complete development of the embryo, and it can cause fatal hemorrhaging in the pregnant female. As the zygote moves through the fallopian tube it undergoes several rounds of cell division, a process called cleavage. These cell divisions produce the inner cell mass (ICM), which will become the embryo, and the trophoblast, which surrounds the ICM and interacts with maternal tissues. Together, the ICM and the trophoblast are called the blastocyst.

There, the newly hatched embryo starts releasing hormones that prepare your body for baby, turning off your period, building up the placenta, and possibly making you feel crampy and tired. Just prior to ovulation, the endometrium begins to thicken and to expand in response to the release of estrogen from the ovaries. As the embryo moves through the fallopian tubes, the endometrium proliferates, changes in shape, becomes receptive to implantation, and produces a hospitable environment for the embryo. Signaled by the release of progesterone from the ovaries, a series of changes called decidualization occurs.



After the fertilization, the ovum is known as zygote. Zygote takes 3 to 5 days to reach the uterine cavity from fallopian tube. While travelling through the fallopian tube, the zygote receives its nutrition from the secretions of fallopian tube. After reaching the uterus, the developing zygote remains freely in the uterine cavity for 2 to 4 days before it is implanted. Thus, it takes about 1 week for implantation after the day of fertilization. During the stay in uterine cavity before implantation, the zygote receives its nutrition from the secretions of endometrium, which is known as uterine milk. Just before implantation, the zygote develops into morula and then the implantation starts. A layer of spherical cells called trophoblast cells is formed around morula. Trophoblast cells release proteolytic enzymes over the surface of endometrium. These enzymes digest the cells of the endometrium. Now, morula moves through the digested part of endometrium and implants itself.

Despite the contact between the blastocyst and the endometrium, implantation can fail. There are many potential causes of errors. If implantation does not occur, the endometrium breaks down and sheds, along with the blastocyst, as part of the menstrual cycle. However, if a blastocyst does implant, then the endometrium remains in the uterus, and together with uterine tissue, becomes the maternal portion of the placenta, called the decidua.

## **SIGNS OF A SUCCESSFUL IMPLANTATION**

If the embryo successfully implants, you can expect to experience a number of signs or symptoms. Unfortunately, the earliest signs of success can appear like the normal signs of a period: cramps, headaches, fatigue, and bloating. In 20% to 30% of women, implantation bleeding occurs, similar to what they experience during a period.

However, if it's implantation and not your period, additional symptoms will follow:

- Your breasts may feel sore, tight, or tender.
- If you continue tracking your basal body temperature after ovulation, you may notice that your average temperature has increased.
- This rise in temperature, combined with fatigue and other symptoms, may make you think you have the flu.
- Within a week, you may feel more frequent urges to urinate. This is because increased blood flow to the uterus has put pressure on your bladder.

Of course, the only way to tell if you have had a successful implantation is to take a pregnancy test. If you have any questions, schedule an appointment with your doctor.

