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COLLEGE: MEDICINE AND HEALTH SCIENCES

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COURSE TITLE: RENAL PHYSIOLOGY, BODY FLUID & TEMPERATURE REGULATION AND AUTONOMIC NERVOUS SYSTEM.

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ASSIGNMENT: DISCUSS THE FACTORS FACILITATING THE MOVEMENT OF SPERM IN THE FEMALE REPRODUCTIVE TRACT

The passage of sperm through the female reproductive tract is regulated to maximize the chance of fertilization and ensure that sperm with normal morphology and vigorous motility will be the ones to succeed. The complex process of sperm transport through the female reproductive tract begins at the time of ejaculation. During coitus, 1.5 – 5.0l of semen containing 200 – 500 million sperm is deposited at the posterior vaginal fornix, leaving the external cervical partially submerged in this pool of fluid. At this time, some sperm may be passively taken up by the cervix in a process called rapid transport, otherwise sperm undergoes delayed transport. The optimal pH of sperm viability is between 7.1 – 8.5 and the reduction in sperm motility is at a pH less than 6.0. Normal vaginal pH is 3.5 – 4.0 and the acidic environment of the vagina is toxic to sperm. Both the seminal fluid and cervical mucus present within the posterior vagina are alkaline and acts as buffer.

Rapid sperm transport

Sperm may begin to undergo rapid sperm transport within seconds after ejaculation. This type of movement is thought to be predominantly passive due to the coordinated vaginal, cervical and uterine contractions. Although these contractions are for a short period of time, they are known to be the primary force of rapid sperm transport to the upper female reproductive

tract.

The cervix: the cervix has several important functions which include providing a receptive environment for sperm entry near the time of ovulation, production of mucus called cervical mucus, preventing access of sperm, microorganism and particulate matter to the upper reproductive tract. The structure of the cervix facilitates the performance of these stated functions. The cervical pH is alkaline with an environment which is much more hospitable to spermatozoa than the acidic pH of the vagina. The cervical mucus is secreted through exocytosis by the nonciliated epithelial cells that line the cervical canal. The cervical mucus functions in the exclusion of seminal plasma, exclusion of morphologically abnormal sperm and the support of viable sperm for subsequent migration to the uterus and oviduct. Sperm movement is through the cervical mucus, primarily through the interstitial spaces between the mucin micelles and the sperm's progression depends on the size of these spaces. The size of the interstices is usually smaller than the size of the sperm head. Sperm must push their way through the lower female genital tract. Beside hormonal factors, physical processes such as shearing, stretching and compression can alter the spaces between molecules and consequently, orientation of the mucin filaments. These mechanical forces can be

impaired by thrusting and pelvic contraction during coitus, and by cervical contraction in the pericoital period.

The uterine: sperm motility does not appear to be the only force directing the sperm toward the oviduct because inert particles deposited within the uterus are transported to the fallopian tube. Uterine muscular contraction likely plays a role in this process. Unfortunately, much difficulty has been met in attempts to recover and quantify uterine sperm.

The vagina: at coitus, human sperm are deposited into the anterior vagina, where to avoid vaginal acid and immune response, they quickly contact cervical mucus and enter the cervix.