The Female Reproductive System & Cycle:

Perspectives from the West & the East

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This paper details the female reproductive system and cycle, anatomy and physiology from both Western and Eastern medicine. It then goes into Premenstrual syndrome and Endometriosis, and how both Western medicine and Eastern medicine approach these issues.

FEMALE REPRODUCTIVE SYSTEM: A WESTERN VIEW

Anatomy

The internal female reproductive organs are located in the lower abdomen and include the ovaries, fallopian tubes, uterus, and vagina (Women's Health Interactive 1). This section will discuss the anatomy of each organ in detail.

Each female has 2 ovaries, located on both sides of, and just superior to the medially located uterus. They are walnut-sized organs that start out smooth in texture, but as the girl matures to menarche, the texture becomes more irregular (Parker 2). (This will be covered in more detail later). They are attached to the uterus, as well as the peritoneum by way of the broad, suspensory and ovarian ligaments (Shier et al. 868).

The ovaries contain two distinct tissue layers: the inner medulla and the outer cortex. The medulla is mainly loose connective tissue, blood and lymphatic vessels as well as nerve fibers. The cortex contains more compact tissue which has a granular appearance due to tiny lumps of cells, the ovarian follicles, which contain immature or primary oocytes, which will later mature into eggs or ova (singular is ovum). Within the follicle, the primary oocyte is surrounded by epithelial cells known as follicular cells. A woman is born with all the oocytes she will ever have. At birth, her ovaries contain nearly a million oocytes, and by the time she reaches puberty, about 400,000 will remain (Shier et al. 868).

The soft and movable fallopian tubes, also called uterine tubes, extend about 10 cm. from the ovaries to the uterus, providing a passage by which mature ova may enter the uterus from the ovaries (Parker 3; Shier et al. 873). They are suspended by sections

of the broad ligament. At the ovary end, the tube expands into the cone-like infundibulum with finger-like projections called fimbriae extending around and cupping the ovary. The inner layer of the tube is mucosal with many longitudinal folds and cilia, which move the ovum toward the uterus. The middle layer is muscular, and the outer layer is a peritoneal covering (Shier et al. 873-75).

The uterus is a fist-sized organ which is located medially and very low in the pelvis, situated behind the urinary bladder, and in front of the colon (Shier et al. 868). This is a hollow and muscular organ, providing the space in which a fertilized ovum (zygote) may mature into a child. It is attached to the pelvic walls and floor by the broad ligament and the round ligament (Shier et al. 875).

The upper two-thirds of the uterus is referred to as the body, with a dome-shaped top called the fundus. Usually it is bent forward over the urinary bladder, but in some women it is retroverted, leaning backward into the intestines. The lower one-third of the uterus is known as the cervix. The opening in the cervix, called the ostium uteri, (or "os" for short), opens into the superior portion of the vagina (Shier et al. 875).

The uterine wall consists of three tissue layers. The innermost layer is called the endometrium. This is a mucosal epithelial layer which contains many tubular glands. The middle layer is a muscular layer called the myometrium. This is smooth muscle tissue situated in longitudinal, circular and spiral patterns. The serosal outer layer is the perimetrium (Shier et al. 875).

The vagina is the muscular and fibrous tube that extends from the uterus to the outside. It is about 9 cm in length, extending superiorly and slightly posteriorly into the pelvic cavity. It provides a passage for uterine secretions, for the erect penis during

intercourse, and for the fetus at birth. It is attached to the urinary bladder, urethra and rectum by connective tissues. The upper quarter of the vagina is separate from the rectum by a rectouterine pouch, also known as the cul-de-sac (Shier et al. 875; Ballweg 450). At its upper end, the vagina surrounds the end of the cervix, creating recesses between the vaginal wall and the cervix called fornices (singular is fornix) (Shier et al. 875).

The vaginal wall is created of three layers. The innermost layer is mucosal and consists of many folds and ridges. The mucous comes from glands in the cervix and in the vestibular glands at the mouth of the vagina. The middle layer is smooth muscle fibers arranged in both longitudinal and circular directions. At the lower end of the vagina is a thin band of striated muscle which assists in partially closing the vaginal opening. The outer layer is a dense fibrous connective tissue layer which attaches the vagina to the surrounding organs (Shier et al. 876).

Physiology

Female Reproductive physiology will be covered in two sections. The first section will focus on ovarian function with respect to oogenesis, follicle maturation, and ovulation as well as the hormones involved in the processes. The second section will describe the menstrual cycle, the hormones involved and their specific actions and functions.

Starting at the time of puberty, a few of the primary oocytes are stimulated into meiosis, where the resulting cells have 23 chromosomes, half the number of the parent cell. This is known as oogenesis. When the primary oocyte divides, it does so unevenly, so that most all of the cytoplasm goes to one side. The small cell is called the first polar

body. The larger one is called the secondary oocyte, and can now be properly referred to as an ovum or egg. If, after maturation, it were to become fertilized by a sperm cell from a male, it would divide again, unequally, forming a second polar body and a larger cell called the zygote, which would develop into the embryo. The polar bodies eventually degenerate. The function of this unequal division is to provide the zygote with as much cytoplasm and organelles as possible until it is developed enough to begin to manufacture its own (Shier et al. 870).

Also at the time of puberty, the hypothalamus, an endocrine gland in the brain, releases gonadotropin releasing hormone (GnRH), which stimulates the anterior pituitary gland in the brain to release a hormone called follicle stimulating hormone (FSH). In response, the ovaries enlarge and some of the primordial follicles mature. The oocyte inside a follicle enlarges while the surrounding follicular cells divide and reproduce into a stratified epithelial tissue made up of granulosa cells. The granulosa cells are slowly separated from the oocyte by a layer of glycoprotein called the zona pellucida. This whole unit is now called a primary follicle. At the same time, the surrounding ovarian cells situate themselves into two distinct layers around the follicle, referred to as the thecal cells. The inner layer, which is vascular, called the theca interna, contains estrogen hormone releasing cells as well as loose connective tissue. The outer layer, called the theca externa is tightly packed fibrous connective tissue (Shier et al. 871).

As puberty continues, the ovaries begin secreting estrogen, a female sex hormone which develops the secondary sexual characteristics of females' bodies, such as breasts, maturation of the mammary glands, enlargement of the vagina, uterus, ovaries and external genitalia, increased vascularization of the skin, and increased adipose tissue on

the hips, thighs and buttocks. Other characteristics, such as pubic and axillary hair are more linked to androgen (male sex hormones), which are produced by the adrenal cortices (Shier et al. 878).

In the ovaries, the follicular cells continue to reproduce, and when 6 to 12 layers of epithelial tissue have formed, spaces between them begin to fill with fluid. These spaces then join to form one large cavity called the antrum. The oocyte gets pushed to one side of the follicle. Now is it called a secondary follicle (Shier et al. 871).

The follicle is mature (and referred to as a Graafian follicle) when the antrum is so large that the follicle is 10 mm in diameter, and it bulges outward on the ovary surface. The oocyte inside is large and surrounded by follicular cells which supply nutrients to the oocyte, called the corona radiata, and a thick layer of glycoprotien, called the zona pellucida, which separates the oocyte from the granulosa cells. Though as many as 20 primary follicles may begin maturing simultaneously, usually one outgrows the others and fully matures while the others degenerate (Shier et al. 871).

The secondary oocyte is surrounded by the corona radiata. The zona pellucida is visible as the clear space between the oocyte and the granulosa cells. (Source: Echt, Mature Graafian Follicle).

Ovulation is the monthly, cyclical process by which the ovum (with one or two layers of follicle cells) is released from the ovary into the infundibulum of the fallopian tubes. Luteinizing hormone (LH) from the anterior pituitary gland stimulates ovulation by causing the mature follicle to quickly swell and its walls to weaken, which eventually rupture, releasing the ovum. It is in the fallopian tube that the egg should be fertilized. If it is not, it will degenerate within a short time (Shier et al. 872).

After ovulation, the ruptured Graafian follicle may fill with blood until healed. The figure below shows a ruptured Graafian follicle filled with blood, or hemorrhagic. (Source: Echt, Hemorrhagic Corpus Luteum).

LH causes the remaining structure of the follicle to become a pocket of cells that acts as a temporary endocrine gland, called the corpus luteum. The corpus luteum produces the progesterone hormone, and stops when either the placenta of an embryo begins to produce progesterone, or when the corpus luteum degenerates shortly after the menstrual period if no fertilization occurred.

As more and more ovulations happen, the surface of the ovary becomes rough and pitted. After menopause, the follicle maturation and ovulation functions cease and the ovaries shrink to the size of an almond (Parker 2).

The menstrual cycle is divided into 3 or 4 stages, depending on the source. For the purpose of this paper, we will examine the cycle in 4 stages, to include the ovulatory phase, already detailed above, as its own distinct phase. Females begin the menstrual cycle at the time of puberty, around age 13, and experience it monthly until around their late forties to middle fifties, except when interrupted by pregnancy. The balance between the hormones of the hypothalamus, pituitary and the ovaries must be in a homeostatic balance, fluctuating together to cause the cyclic changes, the ultimate goal of which is to produce a viable oocyte, or egg cell, ready for fertilization.

The menstrual cycle is generally accepted to begin on day 1, the first day of Menses, or bleeding. Menses usually lasts 4 to 5 days. In this phase, the lining of the uterus, the endometrium, and its blood vessels break down and discharge through the vagina, releasing blood, mucus, and cell debris (Pink Monkey 2). Also, during this

phase, the anterior pituitary gland releases both FSH and LH, which stimulate the ovary and begin follicular growth (Women's Health Interactive 2).

The next phase, known as the Proliferative phase, happens in the time between the end of the Menstrual phase and Ovulation (days 6 – 14). During this time, estrogen from the developing follicle in the ovary stimulates the endometrium of the uterus to grow and thicken. At this phase, the hypothalamus is sending GnRH to the anterior pituitary at the rate of about 1 bolus per hour (Creighton 1).

At mid-cycle, around day 14, when the follicle in the ovary is mature, and estrogen levels have peaked, the hypothalamus increases the rate of GnRH secretion greatly, sending rapid successions of boli to the anterior pituitary gland which releases large amounts of LH and FHS. A peak in both of these hormones occurs about 24 hrs later. 9 hours after the LH spike, which weakens and ruptures the follicular wall, ovulation occurs (Shier et al. 879; Creighton 1).

Also at mid-cycle, in response to the estrogen peak, the cervical mucous begins to change in preparation for receiving sperm from the male (Women's Health Interactive 2). This is known as E-type (estrogen-stimulated) mucous. It is similar in texture and consistency to uncooked egg white, and, when put between the thumb and forefinger, stretches an inch or more. This type of mucous indicates ovulation and, as such, the most fertile time of the month (Northrup 341-2).

The last phase, known as the Secretory phase, involves the release of abundant progesterone and estrogen from the corpus luteum in the ovary. Progesterone causes the endometrium to become more glandular and more vascular, and stimulating the uterine glands to secrete fluids into the endometrium that is filled with nutrients and electrolytes.

These provide the ideal growth medium for a developing embryo, if the egg is met with a sperm and fertilization occurs (Shier et al. 880). About 10 days after ovulation, the corpus luteum degenerates, and, if fertilization does not happen, the concentrations of estrogen and progesterone decline markedly. In response to the hormonal decline, the blood vessels to the endometrium constrict, cutting off the nutrient supply. Within a few days (generally by the 28th day) the tissues disintegrate and slough off, starting the Menstrual phase once again, as was discussed at the beginning of this section (Shier et al. 880).

The fact that the hormones controlling the female reproduction come from glands in the brain suggests that neural input may play an important role in regulating the cycle, and also explains why factors such as stress, environment and the cycles of other women in close proximity have a marked effect (Creighton 1). It may also explain why hormonal imbalances cause emotional and behavioral changes.

Hormones

The following is a table of the glands, hormones and the functions of the hormones involved in the female reproductive cycle (Sources: Shier et al. 879; IndiaParenting 1; Creighton 1).

Gland	**Hormone**	**Actions**
Hypothalamus	Gonadotropin Releasing Hormone	Stimulates the Anterior Pituitary to secrete Follicle Stimulating Hormone and Lutenizing Hormone.
Anterior Pituitary	Follicle Stimulating Hormone (Gonadotropin)	Stimulates the follicles in the ovaries to enlarge and mature, which in turn, creates estrogen.
Anterior Pituitary	Luteinizing Hormone (Gonadotropin)	Causes the follicular wall to weaken and break, releasing the ovum from the ovary, which, in turn, allows the remaining corpus luteum to secrete estrogen and progesterone.

Ovary	Estrogen	Regulates and sustains female sexual development, secondary sexual characteristics and reproductive function. Stimulates the endometrium to thicken and grow.
Ovary	Progesterone	Stimulates endometrium to become more vascular, glandular and suitable for embryo development. Inhibits secretion of LH and FSH.

History

It is interesting to note that prior to the 1900's, female hormonal processes were not known at all (Parker 1). Menses was thought to be a result of irritation to a non-existent structure called the "fallopian tube nerve." It was believed that women bled because they had too much blood. When a girl reached menarche, she was thought to be susceptible to weakness, lethargy and disease. The ovaries were thought to be the main influence on a woman's emotions and diseased ovaries were believed to cause insanity. Removal of the ovaries was commonly performed to treat a variety of what were considered emotional problems, such as overeating and erotic tendencies (Parker 1). It was not until the 1920's that estrogen and progesterone were discovered, partly because social norms of the day would not allow pelvic examinations, so all diagnoses were based entirely on reported symptoms sent by the patient via messenger. If an examination was absolutely necessary, the woman was completely covered in drapes so the doctor couldn't see anything. Also, a woman's ideas about her own body were not respected and women were not considered stable enough to be physicians themselves (Parker 1).

FEMALE REPRODUCTIVE SYSTEM: AN EASTERN VIEW

Anatomy

With regard to anatomy, of course the physical structures of female reproduction are the same as one would see from a western medical perspective. However, Chinese medicine attributes more to organs than physical anatomy and biochemical processes. Here we deal more with the energetic functions of the organs, which may or may not correlate with the biochemical processes as seen from a Western point of view.

The basic constitution of women is based on Blood, which is stored in the Liver and Uterus, and is the source of periods as well as fertility, conception, pregnancy and childbirth. It is said that women store the Uterus, Blood and fetus. This is in contrast to men, who store Qi and Essence, and whose basic constitution is based on Qi (Maciocia, Ob 7).

The Uterus, also referred to as Baby's Abode or Blood Zang, actually encompasses the structures of the uterus, fallopian tubes and ovaries. It corresponds with the Dan Tian, or Hara, or Lower Field of Elixir (which in men is the Room of Sperm). It is here that the extraordinary energy vessels of the Chong Mai, Ren Mai (or Conception Vessel) and Du Mai (or Governing Vessel) originate, all of which have functions that directly affect reproductive systems in both men and women. It is classified as one of the 6 extra Yang organs, as it is hollow and has a role of being a conduit, as demonstrated in menstruation or childbirth. However, it also has a Yin organ function, which is that of storing, as seen in its ability to store blood as well as hold and nourish a fetus. The Uterus is energetically connected to the Kidneys by a channel called the Bao Luo, and to the Heart by a channel called the Bao Mai. This shows that the health of the Heart and

Kidneys directly affects the state of the menstrual cycle; specifically, Heart Blood, Heart Yang, and Kidney Qi can all affect menses and fertility. The Uterus, together with the Kidneys and the extraordinary vessels discussed below are responsible for all the functions that western medicine relates to the female reproductive system, including the hypothalamus, pituitary, and ovarian hormonal system (Maciocia, Ob 8, 20).

The Menstrual Cycle

In Traditional Chinese Medicine (TCM), a cycle of 26 to 32 days is considered normal. Regularity is of utmost importance, giving valuable information that leads to diagnosis. As in western medicine, there are 4 distinct phases to the menstrual cycle. The Menstrual Phase (lasting about 5 days), is characterized by moving of Blood, which is moved by the free flow of Liver Qi and Liver Blood. The Post-menstrual phase (lasting about 7 days) is characterized by relative depletion of Blood and Yin. This phase corresponds to the Proliferative Phase in western medicine. In the Mid-Cycle phase (about 7 days), which corresponds to the Ovulatory Phase in western medicine, the Blood and Yin gradually fill the Chong Mai and Ren Mai extraordinary vessels. Lastly, the Pre-menstrual phase (again, about 7 days), sees the Yang Qi rise and Liver Qi move in preparation for moving the Blood of the menses. This phase corresponds to the Secretory Phase in western medicine (Maciocia, Ob 9).

The phases of the cycle give the TCM practitioner a guide line for treatment. For example, if the woman is in her post-menstrual phase, it would be a good time to nourish Blood and Yin. At mid-cycle, it is best to nourish Essence and Kidneys. And, during the Pre-menstrual phase, it is good to tonify Yang (if deficient) and move Liver Qi (Maciocia, Ob 11).

Essence, Blood & Internal Organ Influences on the Female Cycle

Essence is a most treasured substance in the body; it is that which sustains life, determines constitution and disease resistance, intelligence, and vitality, and is responsible for the entire life cycle, from conception and birth through growth, puberty, maturity, and eventual decline of the body and mind, leading to death. In men it moves in 8-year cycles, and in women, 7-year cycles. One is born with a fixed amount of "Pre-heaven Essence", which must be conserved and protected, through balanced living, in order to ensure health and long life. It is when this Essence has been depleted that degeneration, infertility, aging and eventually death occur. The state of one's Essence is that which determines longevity and how gracefully one ages. In life, Essence is lost through any type of behavior which is excessive, such as too much work, not enough exercise, poor nutrition, any emotional extreme, stress, drugs, alcohol, toxicity and too much sex (Maciocia, Foundations 38-41). Men lose Essence directly when they ejaculate. Women lose Essence through menstruation and ovulation, but a larger amount may be lost in childbirth (Maciocia, Ob 61-63). Pre-Heaven essence can be positively affected by living a balanced life, and also by energetic practices such as Tai Chi, Qi Gong, and certain martial arts practices which focus on cultivating Qi and storing it in the Dan Tian, mentioned above. This illustrates the importance of the Dan Tian in not only reproductive function, but in overall health and vitality (Maciocia, Foundations 38).

The Uterus is connected to the Kidneys via a channel called the Bao Luo. The Kidneys store the Essence, which is the foundation of the Tian Gui, which is the material substance of menstrual blood. "Tian" refers to "Heaven" and "Gui" refers to "water." The "water" aspect of Tian Gui associated it more with the Yin aspect of the Kidney, as

Yin is more cooling, nourishing and fluid. (Tian Gui is also the origin of sperm in men). At puberty, the Tian Gui is full and gives rise to the periods. As mentioned above, the Essence moves in 7-year cycles in females, so, age 14 is about the time that the periods come and the girl can reproduce (Maciocia, Ob 11).

The Kidneys, more specifically, the Kidney Yang is also related with the Ming Men, or the Gate of Life, or Minister Fire, which is located between the two Kidneys, and is closely related with the Original Qi (which is Essence in Qi form) from which the Chong, Ren and Du Vessels arise. It is responsible for warming the Uterus, balancing the Yin, controlling the libido, and making conception possible (Maciocia, Ob 12). From this, we can see that the Kidneys are both Yin and Yang, the source of both Fire and Water. Maciocia states, "the Minister Fire is the Fire within Water, interdependent with Water, and inseparable from it." (Maciocia, Ob 12). This is why, in women, Kidney deficiency often involves both Yin and Yang (Water and Fire). And, if the Ming Men becomes deficient, the Uterus becomes cold, which can lead to dysmenorrhea, amenorrhea and infertility. If the Minister Fire accumulates due to stagnation, it may heat the Blood, causing excessive bleeding, infertility or miscarriage (Maciocia, Ob 12, 64).

Blood, in Eastern Medicine, is not only the red fluid substance flowing through the arteries, veins and capillaries; it contains Qi and Yuan Qi, which direct and move the Blood, and provide the nourishing qualities that Blood brings to all parts of the body. Blood, which is the essential substance for menses and fertility, is produced by the Spleen from food, governed by the Heart, and stored in the Liver. In fact, it is often Liver Blood that is focused on when treating menstrual disorders, as it is most often understood that

the Uterus receives most of its Blood from the Liver. But, there is a difference: the menstrual Blood made of Tian Gui is specific to the Uterus and menses, while Liver Blood, which plays a role in menses, also nourishes the rest of the body, specifically the eyes, nails, sinews, skin and hair (Maciocia, Ob 12-13).

Liver Qi is responsible for moving the menstrual Blood. If Liver Qi stagnates, pre-menstrual syndrome, irregular periods or dysmenorrhea can result. Liver Blood deficiency may lead to Liver Qi stagnation. And, if long term, Liver Qi stagnation can lead to Liver Blood stagnation, which can lead to large blood clots in menses, more severe dysmenorrhea, and abdominal masses such as cysts (Maciocia, Ob 12, 37).

If Liver Blood is deficient, it often points to the fact that Spleen Qi is too deficient to make the Blood. Besides generating the Blood, the Spleen also is responsible for holding the blood in the vessels, so, deficiency-type menorrhagia is usually a Spleen Qi issue. The Spleen also keeps organs in place; prolapse of uterus or bladder indicates Spleen Qi pathology (Maciocia, Ob14).

The ancient Chinese doctor and author, Fu Qing Zhu said that menstrual blood is not Blood at all, but only Tian Gui, formed from the Kidney Yin with the help of Heart Yang. It is said that perhaps the Ming Men Fire is that which is responsible for turning the Tian Gui red, and that the Spleen, Liver and Heart have little to do with the generation of menstrual Blood, and only serves to transform it. There is also a passage in The Secret Records of Master Feng's Brocade Bag that says that menstrual Blood is made red with the aid of the Heart, as the color pertaining to the Heart is red (Maciocia, Ob 11-14).

It is via the Bao Mai that the Heart influences menses. It is this connection that explains how stress and emotional shock can influence the cycle. Also, depression and post-natal psychosis become explainable, as the Heart, and hence, the Shen, or personality, is affected by the deficiency of Blood in the Uterus after childbirth (Maciocia, Ob 14).

The Lungs can sometimes affect the menses when a great deal of grief or sadness depletes the Qi, which can deplete Spleen Qi, and cause the problems associated with Spleen Qi deficiency. The Lungs also play a role in the production of breast milk (Maciocia, Ob 14).

The Stomach influences gynecology in a number of ways: First, the Chong Mai actually connects the Stomach and the Uterus, which explains why morning sickness often occurs with pregnancy, as the fetus causes a "disruption" in the Chong Mai, causing the Stomach Qi to rebel. The Stomach is also the source of Qi and Blood in the body, which, as mentioned above, is important for proper functioning of the Spleen, Heart and Liver, which, in turn, have direct influences on the female cycle. The Stomach channel also traverses the breast, and is often treated in breast disorders (Maciocia, Ob 15).

Extraordinary Vessel Relationship with the Female Cycle

In addition to the 12 Main Meridians of Chinese medicine and acupuncture, there are 8 Extraordinary Channels. Only 2 of these, the Ren Mai and the Du Mai actually have their own body points. The other 6 Extraordinary Vessels must share points with the 12 main meridians. According to Kiiko Matsumoto and Stephen Birch, the Extraordinary Vessels have close relationships with hormonal functions and the

endocrine system. (85). Maciocia outlines the functions of the Extraordinary Vessels as follows (Foundations 355-56):

1. They function as reservoirs of energy, where the 12 main meridians act as rivers, allowing them to absorb energy from the 12 main meridians when there is abundance, or distribute energy to them when needed.
2. They all derive from the Kidneys and contain Essence, which they circulate throughout the body. They act as a connection between Pre-heaven essence and supplemental Qi which may benefit the essence (also known as Post-heaven essence.)
3. They circulate Defensive (or Wei) Qi over the thorax, abdomen and back, providing resistance against external pathogenic factors.
4. As mentioned above with regard to Essence, they regulate the 7 and 8-year cycles of women's and men's lives.

As mentioned earlier, the Chong Mai (Penetrating Vessel), Ren Mai (Conception or Directing Vessel) and the Du Mai (Governing Vessel) all have integral responsibilities with regard to the menstrual cycle and reproductive functioning. All three arise out of the space between the two Kidneys, the Dan Tian, and flow through the Uterus (Maciocia, Ob 15). Also having relevance to female reproductive system are the Dai Mai (Girdling Vessel) and the Yin Qiao Mai, (Yin Heel Vessel) (Maciocia, Ob 20, 21).

The Chong Mai is known as the Sea of Blood. In the classical text, The Mirror of Medicine, by Master Luo, it is stated that, "The Blood of the Internal Organs flows to the Penetrating Vessel which is the foundation of the menses." (Maciocia, Ob 15) It is in

control of the supply and proper movement of the menstruation. Maciocia says that the Chong Mai "provides and moves Blood… and irrigates the Essence." (Ob 17)

This channel travels from the Dan Tian up through the abdomen, chest and throat, and it has branches that travel in the spinal canal and down the medial aspect of the legs to the foot. All extraordinary vessels, with the exception of the Ren Mai and the Du Mai do not have their own points, and must be accessed via the points of the other meridians. Aside from the Master Point (Spleen-4) and Couple Point (Pericardium-6) of the Chong Mai, which are the most important points to open and access its energy, other points of access are Ren-1, Stomach-30, and Kidney-11 through Kidney-21 (Maciocia, Ob 18).

It follows the 7-year cycle for females: at age 14, the Chong Mai is strong and flourishing, and the girl begins to menstruate, and at 49, the Chong Mai and the Ren Mai become depleted, the Tian Gui no longer flourishes, and menstruation ceases. Though it is not stated directly, it may be inferred that the Tian Gui, produced by the Kidneys and transformed to blood with the help of the Heart Yang, is stored in the Chong Mai and Ren Mai, until used in menses (Maciocia, Ob 17).

The Chong is also related to the Blood that nourishes the skin and promotes the growth of body hair. Facial hair, especially, is dependent on abundant Blood in the Chong Mai. Since women naturally have less Blood than men do, because they lose it monthly, facial hair does not grow on women, but only on men, who do not lose their Blood regularly (Maciocia, Ob 18).

Having many similar functions and pathologies as the Liver Blood on menses, the Chong Mai can treat pre-menstrual syndrome, irregular menses, dysmenorrhea,

amenorrhea, and scanty or late periods stemming from Blood Stasis, gastrointestinal stagnation, and Blood Deficiency (Maciocia, Ob 18; Pirog 190-91).

The Ren Mai (or Directing Vessel) is called the Sea of the Yin Channels. In contrast to the Chong Mai, which is associated with Blood, the Ren Mai is associated with Yin, Essence and Fluids. Also, it is intimately connected with all structures of the reproductive system, both internal and external, especially the cervix, vagina and vulva (Maciocia, Ob 18).

The Ren Mai begins in the Dan Tian, passes through the Uterus, emerges at Ren-1 at the perineum, and then travels up the midline of the anterior (front) body all the way to the chin. From here it encircles the mouth and goes to the eyes. (Maciocia, Ob 18). Unlike the Chong Mai, the Ren Mai has its own body points, and may be accessed through them. However, the Master Point is Lung-7 and the Couple Point is Kidney-6.

As stated above, the Ren Mai is said to provide the Essence, Blood and Fluids necessary for all female processes and hormonal stages of life related to reproduction. It is often supplemented in treatment to address the Yin deficiency common in post-menopausal women (Maciocia, Ob 18). According to Maciocia, the Ren Mai is important for menarche, fertility, conception, pregnancy, whereas the Chong Mai is more associated with menstruation and its pathologies (Foundations 19).

The Du Mai, also called the Governing Vessel, is associated with the more Yang aspects of the reproductive functions, such as the Ming Men Fire, warming the uterus, increasing libido and fertility. It is actually often viewed as continuous, in function and in trajectory, with the Ren Mai; the Du Mai being the Yang aspect, where the Ren Mai is the Yin (Maciocia, Ob 20).

The path of the Du Mai starts similar to that of the Ren Mai, beginning in the Dan Tian, passing through the Uterus and genitals, and emerging at the perineum at Ren-1. From there, the primary channel of the Du Mai travels up the midline of the posterior body, in the spinal column, traveling into the brain, around the top of the skull and down the midline of the face to the tip of the nose and upper lip (Maciocia, Ob 19). However, the internal branches of the Du Mai are slightly more complex: Entering the Kidneys, and traveling up the midline of the anterior body, as the Ren Mai does. Together with the Ren Mai, the Du Mai creates the longitudinal axis of the body, connecting the Uterus, Kidney, Heart and brain, and accounting for the Western concepts of the hypothalamus, pituitary, ovarian hormonal interchange detailed above (Deadman 531; Maciocia, Ob 20).

The Master Point of the Du Mai is Small Intestine-3, and the Couple Point is Bladder-62; other important influential points are Du-1, 16, 20, Bladder-1 and Bladder 12 (Deadman 529-30).

The Dai Mai, or Girdling Vessel, encircles the channels of the legs and has a relationship with the movement of Liver Qi. It also harmonizes the ascending and descending of the Spleen and Kidneys (Maciocia, Ob 21). As its path runs horizontally through the middle of the body, essentially like a belt, it acts to tie together the vertically running channels, creating a connection between them. Problems can arise if the "tie" becomes "too tight", restricting the flow of the Liver Qi, and the function of Kidney and Spleen, or if the "tie" is "too loose", failing in its duty to guide and support the Essence and the Qi of the Uterus (Maciocia, Ob 21). The strength of the Chong Mai, Ren Mai and Du Mai are all dependent upon the state of the Dai Mai.

The Master Point of the Dai Mai is Gall Bladder-41, and the Couple Point is San Jiao-5, but other important points on the channel are Liver-13 and Gall Bladder-26, 27, and 28 (Deadman 20).

Lastly, the Yin Qiao Mai, or Yin Heel Vessel, has an influence on the lower abdomen and is most helpful with patterns of Excess in this area, such as abdominal masses, fibroids, difficult delivery and placenta retention, as well as any problems of the external genitalia due to an Excess pathology (Maciocia, Ob 22). It travels from the medial ankle up the medial leg to the external genitalia, up the abdomen, chest, and throat, into the face and inner canthus of the eye.

The Master Point of the Yin Qiao Mai is Kidney-6, and the Couple Point is Lu-7, just opposite to those of the Ren Mai.

COMMON PATHOLOGIES OF THE FEMALE REPRODUCTIVE SYSTEM

This section will explore a few of the everyday complaints women of reproductive ages experience with regard to their hormonal, menstrual and/or reproductive cycle. Specifically, pre-menstrual syndrome and endometriosis will be looked at from both western and eastern styles of medicine, including symptoms, pathology, treatment, drugs and herbal therapies.

Pre-Menstrual Syndrome

It is estimated that at least 60% of women suffer from Pre-Menstrual Syndrome (PMS). More common in women in their 30's, it can happen to any woman (Northrup 118). It was not recognized by the western medical system until 1953, at which time it was listed as a psycho-physiological disorder. It wasn't until 1983 that diagnostic

guidelines were established in the United States (Davidson 2). An article in Family Circle magazine in the 1980's outlined the syndrome and popularized its symptoms and name (Northrup 118).

Symptoms of PMS

Many symptoms can occur with PMS. The most important distinguishing factor is that the symptoms occur in a cyclical fashion, paralleling the menstrual cycle. In the early stages, women complain of symptoms occurring a few days prior to menses. As time goes on, without treatment, the symptoms begin to appear earlier and earlier in the cycle. Some women have symptoms during ovulation and for the week before menses. Eventually it is not uncommon to only feel 3 days a month of no symptoms, and some women experience PMS nearly all the time (Northrup 119).

The most common symptoms of PMS are irritability, moodiness, weepiness, abdominal bloating, acne, aggression, alcohol intolerance, anxiety, asthma, back pain, breast swelling and pain, confusion, depression, fatigue, fainting, food binging, craving for sweets, insomnia, headaches and migraines. Though menstrual cramping is often put into this list of symptoms, cramping is not a symptom of PMS. Many women with PMS have pain-free periods, and some women with cramping do not have PMS (Northrup 119-20).

Causes of PMS

As of yet, there is no known definitive cause of PMS. It is believed to be based on hormonal imbalances; both estrogen and progesterone act as neurotransmitters and can profoundly affect the mood. When the two are not in proper ratios, the woman can suffer. These hormonal imbalances may be initiated by or made worse by the following:

onset of menses, pre-menopause, discontinuation of the birth control pill, a time of amenorrhea, childbirth or abortion, complications during pregnancy, tubal ligation, or severe emotional trauma. Also, there seems to be a link between PMS and certain prostaglandins, which are chemical messengers that trigger inflammation (more will be discussed about prostaglandins in the Endometriosis section of this paper). All of these types of hormonal and chemical imbalances may be positively affected by changes in diet, exercise, vitamins and progesterone therapy (Northrup 118-121).

It has been found that common among women who suffer from PMS are the following: high consumption of dairy products, caffeine, and refined sugars, and animal fat, low consumption of whole grains and vegetables, high blood levels of estrogen, low blood levels of B vitamins and progesterone, excess body weight, low levels of Vitamin C, E, Selenium, Magnesium, and inadequate exposure to sunlight (Northrup 121-22).

Western Treatments for PMS

Conventional Western Medicine often treats the symptoms of PMS individually, offering pain killers for headaches, diuretics for bloating, sedatives for anxiety, and even psychotherapy. None of these address the underlying causes of the disorder (Northrup 122). Some doctors recommend going on the birth control pill to help correct hormonal imbalance (Maciocia, Ob 357).

Alternative western medicine recommends the following dietary changes: consume a high complex carbohydrate, low fat diet, take a multi-vitamin/mineral supplement, eliminate refined sugars and flours as well as caffeine, increase consumption of essential fatty acids, especially gamma linoleic acid (GLA) for proper hormone metabolism and to encourage formation of certain other prostaglandins which calm

inflammation, stress reduction practices, 20 minutes of aerobic exercise per week, exposure to full-spectrum light and natural progesterone therapy if the above suggestions do not improve the symptoms (Northrup 124-25).

Eastern Treatments for PMS

TCM sees most of the symptoms of PMS as classic of Liver Qi Stagnation, though other patterns may be involved. Below is a table of the most common diagnoses and treatments of PMS according to Traditional Chinese Medicine (Maciocia, Ob 339-56). From this table we can see that TCM differentiates many types of PMS, and has comprehensive therapies for each of them. Unlike western treatments, these treatments address the underlying causes, treat the root of the problem, and have no adverse side effects, offering a safe and effective long-term solution to PMS.

PMS	Liver Qi Stagnation	Phlegm-Fire Harassing Upwards	Liver Blood Deficiency	Liver & Kidney Yin Deficiency	Spleen & Kidney Yang Deficiency
Main Complaint	Abdominal and breast distention before menses, irritability, clumsiness, moodiness, depression.	Agitation, depression, slightly manic behavior, aggressiveness.	Depression and weepiness before menses, slight abdominal and breast distention, scanty periods	Slight breast distension and irritability before menses, sore back and knees.	Mild depression & weeping, slight abdominal & breast distention.
Other Symptoms	Pain and distention under the ribs.	A feeling of oppression in the chest, Red face, blood shot eyes. Possible mastitis.	Tiredness, poor memory, poor sleep, slight dizziness, dull-pale complexion.	Dizziness, blurred vision, poor memory, insomnia, dry eyes and throat, 5-center heat.	Tiredness, sore back, feeling cold, frequent and pale urination, low libido.
Tongue/ Pulse	Tongue is normal or the sides may be red. Pulse is wiry.	Tongue is red with a sticky yellow coat. Pulse is overflowing, rapid and slippery.	Tongue is pale, possibly only on the sides. Pulse is choppy or fine and possibly wiry on the left.	Tongue is red without coating. Pulse is floating and empty.	Tongue is pale and swollen. Pulse is deep and weak.
Treatment Principle	Soothe the Liver, clear stagnation, calm the Mind.	Clear heat, resolve Phlegm, calm the Mind.	Nourish Liver Blood, move Liver Qi.	Nourish Liver & Kidney Yin, move Liver Qi.	Tonify Yang, Kidney and Spleen.
Points	Liver-3, GallBladder-34, 41, Spleen-6, SanJiao-6, Pericardium-6.	Pericardium-6, 7, Stomach-40, 8, Du-24, Large Intestine-11, Spleen-9, 4, Ren-12, Bladder-20.	Ren-4, 6, Lung-7, Kidney-6, Spleen-6, Stomach-36, GallBladder-34, Pericardium-6, Liver-8, Bladder-18, 20.	Liver-8, 3, Ren-4, Spleen-6.	Bladder-23, 20, Ren-4 (moxa), Stomach-36, Spleen-6, Kidney-3, 6, Lung-7.
Herbal Prescriptions	Xiao Yao San if the distention is greater Yue Ju Wan if the depression is greater Chai Hu Shu Gan Tang if pain in the abdomen & breasts is greater.	Sheng Tie Luo Yin Wen Dan Tang	Xiao Yao San modified, adding Shu Di Huang and Gou Qi Zi. Gui Shao Di Huang Wan	Yi Guan Jian variation, adding Mei Gui Hua and Fo Shou. Qi Ju Di Huang Wan	You Gui Wan

Endometriosis

It is estimated that 12-15 percent of women have endometriosis, which would make it one of the most common diseases on the planet (Albee, Basic 2) . Mary Lou Ballweg, founder of the Endometriosis Association, describes endometriosis as a disease in which "tissue like the endometrium (uterine lining) is found outside the uterus, in other areas of the body….the endometrial tissue develops into what are called nodules, tumors, lesions, implants or growths. These growths cause pain, infertility and other problems." (10) Endometriosis lesions are most often found in the abdomen, on the ovaries, fallopian tubes, bowel, bladder, rectum, ureters, the ligaments supporting the uterus, and the cul-de-sac area between the vagina and the rectum. They can also be found growing on the cervix, in the vagina, or even on the external genitalia (Ballweg 10).

Usually not malignant, these endometrial tissues respond to monthly hormonal changes, just as the endometrium inside the uterus does. So, they grow during the proliferative phase, as well as bleed and shed tissue during menstruation. However, the lesions have been found to be more receptive to estrogen, which builds the tissue up, and less receptive to progesterone, which would have the tissues stop growing (Rister 209). This keeps the tissues in a state of growth more than decline. Problems arise because the blood and shed tissues during menstruation have no place to exit the body. They remain in the abdominal cavity and decay, which causes irritation and inflammation of the surrounding tissues. The surrounding tissues begin to create scar tissue for protection from the irritating substances. As more and more cycles happen, the lesions grow larger and possibly even seed new lesions, while, at the same time the scar tissue grows, eventually adhering tissues to other tissue surfaces within the abdomen. These are called

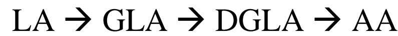
adhesions, and often endometriosis lesions can be found growing on the adhesions themselves (Ballweg 10).

<u>Symptoms & Characteristics of Endometriosis</u>

The most common symptoms of endometriosis are pelvic pain before and during menses, which can get so intense as to be debilitating, pain during and/or after sexual activity, irregular bleeding, infertility and fatigue. If lesions exist on the bowel or rectum, the woman may experience painful bowel movements, diarrhea and/or constipation, particularly during menses. If she has lesions on the bladder, she may experience pain in the bladder. Some women with endometriosis have no symptoms, while others are unable to work, have relationships, or even leave the house (Ballweg 10). Strangely enough, the size of the lesions and the extent of the disease seem to have little bearing on the severity of the symptoms. Small implants have actually been found to produce more inflammatory prostaglandins than larger ones (Ballweg 11).

As mentioned earlier, prostaglandins are hormone-like, chemical messengers. Some are responsible for inflammation and have been linked to PMS, menstrual pain and endometriosis. Other prostaglandins help to counter inflammation. As Nancy Edwards Merrill of the Endometriosis Association states in her article, *Nutrition and Endometriosis*, "Our bodies make prostaglandins from two essential fatty acids, linoleic acid (LA) linolenic acid (LNA)….depending on their fatty acid precursor… prostaglandins fall into three different series. LA is the precursor for both series 1 and 2 prostaglandins; LNA is the precursor for series 3 prostaglandins. In the body, LA is changes into gamma linolenic acid (GLA), then to dihomogamma linoleic acid (DGLA),

and finally to arachidonic acid (AA). Series 1 prostaglandins are made from DGLA, and series 2 come from AA." The figure below illustrates this continuum: (1).



Series 1 Series 2

Merrill goes on to explain that series 3 prostaglandins begin with LNA, change to stearidonic acid (SA), then to eicosatetraenoic acid (ETA), and lastly to eicosapentaenoic acid (EPA), as illustrated below.

Series 3

Series 1 prostaglandins include PGE1, which is a "good" prostaglandin, known to prevent inflammation, prevent blood clots, open blood vessels, slow production of cholesterol, help remove excess fluid from the body, improve nerve function and aid T-cell immunity. It is very important in pain relief because it prevents the release of arachidonic acid from cell membranes, which is the producer of the series 2 prostaglandins; those that cause inflammation, promote clotting, and induce the kidneys to retain salt (and water). The series 3 prostaglandins are also valuable for their anti-inflammatory and anti-clotting functions (Merrill 1).

Much research has taken place studying the links between the series 2 prostaglandins and endometriosis, especially with regard to dysmenorrhea (menstrual pain.) A study in 1992 compared levels of series 2 prostaglandins in women with endometriosis with severe pain as compared to those with endometriosis who had little

pain. There was found to be a marked correlation between the severity of the pain and the level of series 2 prostaglandin production in tissues taken from endometrial cysts. There were also found to be higher levels of series 2 prostaglandins in women with endometriosis-related infertility than in women with infertility not related to endometriosis (Merrill 1).

Another interesting discovery is that the endometriosis lesions themselves contain an enzyme called aromatase, which locally changes most other hormones (or hormone precursors) into estrogen. As stated earlier, the lesions are very receptive to estrogen, which stimulates the lesion to grow larger. The aromatase-estrogen cycle then becomes a positive feedback loop, stimulating the lesions to grow larger throughout all phases of the cycle except for menstruation, which actually may allow seeding of new lesions (Rister 209).

Infertility affects 30-40 percent of endometriosis patients, and somewhere between 30 and 70 percent of infertile women have been found to have endometriosis (Ballweg 11; Maciocia, Ob 259). Endometriosis may cause lack of ovulation as well as luteal phase deficiency, both of which can cause infertility.

Another common phenomenon with endometriosis is the formation of endometriomas, which are cysts that grow on the ovaries. They start from a lesion and progress into a cyst, filled with decayed blood (which has a dark brown appearance, and so is often referred to as a "chocolate cyst") that can grow to a very large size, and actually may rupture, spilling some of its contents into the abdomen, causing symptoms ranging from none to intense pain and inflammation (Albee, Basic 1; Albee, Cyst 1).

However, not all endometriosis patients have cysts, and not all cysts are endometriosis related.

Causes of Endometriosis

Very little is understood about the cause of this disease. There are a number of theories but none of them account for all cases. One of the most common theories to hear about is the retrograde menstruation theory, in which it is thought that during menstruation, some of the blood and tissue flows backward, through the fallopian tubes and into the abdominal cavity, creating the seeds for the first implants to form. There are some researchers who believe that all women have some retrograde menstruation, and it is only in those women with compromised immunity or hormonal imbalances that implants form and begin to grow (Ballweg 11).

Related to this is another hypothesis about immune system dysfunctions, since having endometriosis increases the risk of developing autoimmune diseases such as lupus, thyroid related problems, chronic fatigue syndrome, allergies and candida albicans overgrowth. They have been found to have cells with reduced ability to fight off harmful cells, and an increased number of autoantibodies that attack their own healthy tissues (Endometriosis.org 2).

Another theory involves genetics, stating that the implants exist from birth, and do not begin causing problems until puberty, when the hormones start to stimulate the tissues (Ballweg 11). Related to this is the possibility of an endometriosis gene, which researchers are now looking for, which would explain why the disease is so often found to be hereditary (Endometriosis.org 2).

Research is also beginning to show conclusively that environmental toxins, such as dioxins, which are part of a class of chemical compounds called organochlorines, initiate and exacerbate endometriosis. They are commonly found in our environment in pesticides and herbicides (this includes those sprayed on the food we eat as well as those we spread on our lawns, landscaping and gardens), industrial wastes, household cleansers, and are widely found in products that have been bleached, such as toilet paper, tampons, sanitary napkins, disposable diapers, facial tissue, paper plates, paper towels, coffee filters and cigarette papers (Endometriosis.org 2). Other sources include burning of toxic and municipal waste in incinerators, leaded gas in motor vehicles, certain wood preservatives, and solvents (Ballweg 390).

Also startling is the fact that hundreds of organochlorines are released during the manufacturing and bleaching process; they then make their way into our water and air. As it is stated in the Endometriosis Sourcebook, “One million metric tons of chlorinated organic materials enter U.S and Canadian waterways every year!” (Ballweg 390) At least 177 of these organochlorines have been found in human tissues and fluids, and they are passed on through the placenta and breast milk (Ballweg 386). These chemicals are known to cause immune suppression, cancer and birth defects. They also are able to mimic hormones in the body, which can have profound influences on reproductive organs as well as the entire body.

Only a few of these chemicals have been banned, including PCB’s and DDT. Since 1994, the U.S. Environmental Protection Agency has been considering new regulations on dioxins, of which there are 75 related compounds, but the industries involved in dioxin production are paying off scientists to lobbyists to discredit studies

showing the detrimental effects of these chemicals on human health, and to fight regulation of them (Ballweg 386).

Studies involving rheses monkeys have shown that even doses as small as 5 parts per trillion and 25 parts per trillion is enough to initiate endometriosis, though higher dosages are related with more severe disease (Ballweg 379, 389). They have also found dioxin and organochlorine exposure to have a significant relationship with infertility, miscarriage, and stillbirths in rheses monkeys (Ballweg 378).

Diagnosis of Endometriosis

Most women with endometriosis go through many years of severe pain before they are actually given a diagnosis. If a doctor listens to the patient's complaints and takes them seriously, s/he may suspect endometriosis, but definite diagnosis is not possible without laparoscopic surgery, in which a scope is inserted into an incision in the navel, with carbon dioxide gas pumped into the abdominal cavity, to make the organs more visible. Visual diagnosis with tissue biopsy confirmation is the only definite way to 100% accurately diagnose the disease (Ballweg 11).

Western Treatments for Endometriosis

Treatments are varied, and no one treatment is right for all women, simply because each woman has the disease in different places, in different degrees, with different symptoms. Once a patient is diagnosed with endometriosis, the doctor will start with the most conservative treatments available, see how the patient responds, and, if not satisfactory, moves on to the next more invasive treatment. Painkillers are prescribed for the pain, as are anti-inflammatory drugs. Hormonal treatments aim to stop menstruation all together, such as continuous birth control pills or progesterone pills or shots (such as

depo-provera), in order to stop the progression of the disease and avoid menses, which is often the most painful time for those with endometriosis. However, this is a temporary treatment, only useful in women who are not trying to conceive, essentially putting the disease "on hold." Some women do not respond well to such hormone therapy, which may cause symptoms such as irregular bleeding, bloating, weight gain, severe headaches, blurred vision, and edema (Ballweg 12; Albee, Basic 3).

Another hormonal treatment involves a synthetic testosterone derivative known as Danazol, Danocrine or Cyclomen. It was commonly used in the 1970's and 1980's, but has since been replaced as a first-line therapy by Gonadotropin Releasing Hormone analogs (discussed below). Danazol resembles natural steroids, and, relevant to the treatment of endometriosis are the following effects (Ballweg 186):

1. It suppresses pituitary-ovarian signaling, decreasing estrogen production.
2. It inhibits enzymes necessary to produce estrogen in the ovaries and adrenal glands.
3. It binds to androgen and progesterone receptors on endometriosis implants.
4. It reduces the circulating levels of sex hormone-binding globulin.

All of these effects serve to decrease estrogen and increase androgen levels, thereby reducing the symptoms that are created or worsened by high estrogen levels. Danazol is also known to lower autoantibody levels and decrease the inflammatory response to pelvic endometrial cells. All of this together makes it a fairly effective treatment for endometriosis; a six month course of Danazol usually reduces the disease by 30 to 50 percent, measured in terms of visible lesions and caused some level of remission in 70 to 100 percent of endometriosis patients (Ballweg 187).

However, there is no reduction of adhesions, cysts larger than 3 cm, and even smaller cysts, so, it is most helpful with lesions that are associated with moderate or mild endometriosis, serving to reduce menstrual pain, sexual activity-related pain, bowel movement pain, and stop menstruation altogether. However, these effects are temporary, with 30 to 60 percent of women having return of pain within one year of stopping danazol treatment. For some women, the pain is less severe than before the therapy, but 20 percent must seek further treatment (Ballweg 188).

The factor that keeps most women from trying danazol to treat their endometriosis is the side effects. Because of the estrogen decreasing and steroid effects of this therapy, the side effects include hot flashes, decreased sex drive, vaginal irritation, weight gain, acne. These effects are reversible after stopping the drug. However, there are some side effects that may not be reversible, such as loss of the hair on the forehead, deepening of the voice, and even enlargement of the clitoris (Ballweg 189).

The newest class of drug therapy for endometriosis is the Gonadotropin Releasing Hormone analogs (GnRH). These include Lupron Depot, Synarel and Zoladex, the last of which is the newest of these drugs, so there is little written about women's experiences with it as of yet (Ballweg 164). These drugs are very controversial, as they are effective at temporarily suppressing endometriosis, yet, have considerable side effects and long-term negative health implications.

GnRH analogs can be either agonists (which stimulate and then suppress natural hormone production), or antagonists (which directly suppress natural hormone production) (Ballweg 165). Here discussion will focus on the agonists, since these are

more commonly used at this time, first approved for use in 1990 and still used by most gynecologists as the first-line therapy for endometriosis (Ballweg 165).

As discussed above, it is the Gonadotropin Releasing hormone from the hypothalamus that tells the pituitary when and how much LH and FSH to release, which then stimulates the ovaries to make estrogen and progesterone. GnRH agonist drugs are similar to but much more potent than the hormone the hypothalamus releases. It bombards the pituitary with signals and the pituitary begins pumping out large amounts of LH and FSH, which stimulates the ovaries to create large amounts of estradiol, the most potent form of estrogen. This is why most women report significant increase in their pain and symptoms, and even menstruation that has an early onset with more pain and bleeding than usual. After 1 to 3 weeks of this constant stimulation, however, the pituitary gland becomes desensitized to all GnRH, both the synthetic form and the natural form that the hypothalamus continues to produce. Once desensitized, the pituitary stops responding to any GnRH at all, and, consequently, stops releasing LH and FSH altogether, which stops estrogen and progesterone production from the ovaries, which stops ovulation and menses, essentially creating an instant menopause.

GnRH analogs effectively control menstrual, sexual activity-related, and bowel movement pain, though the effects are short term, with recurrence similar to that with danzanol. Women with severe disease at the start of therapy can expect to have pain return more quickly than less severe cases (Ballweg 167).

Short term side effects are similar to those seen with menopause, including hot flashes, night sweats, vaginal dryness, palpitations, insomnia, headache, depression, fatigue, decreased libido, bone demineralization (Albee, <u>Basic</u> 3-4; Ballweg 175). In

fact, it is due to the bone demineralization effect that use of these drugs are limited to 6 months. Studies on just how much bone density is lost varies greatly, ranging from 0.2 to 12.8 percent after 6 months of GnRH therapy. Reversibility of this bone loss is still being studied, but initial studies are unable to report complete recovery of the spinal vertebrae. It is unknown how this loss (which usually occurs at a relatively young age) may or may not affect a woman over her lifetime. It is also suggested that the rate of bone loss, which is faster than that of menopausal women, and the kind of bone may be more of a concern than the amount of bone lost. Little is understood at this point, but, needless to say, women with high risk factors for bone loss (such as metabolic bone disease, family history of osteoporosis, a history of malabsorption, glucocoticoid use or a long-standing pattern of irregular periods) are not given these drugs (Ballweg 171).

However, there are doctors who are beginning to prescribe “add-back” therapy along with GnRH analogs, which is essentially replacing some of the estrogen back into the system with oral contraceptives or similar drugs, in the hope of preventing bone loss. There is no conclusive evidence as of yet whether this approach prevents bone loss, and there is the fact that the added estrogen may stimulate the endometriosis, reversing the effects of the GnRH. It is not yet known if there is an “estrogen window”, a level that would be high enough to prevent bone loss, yet still low enough to not stimulate the disease (Ballweg 171-72).

Longer term side effects aside from bone loss are not generally acknowledged by the western medical establishment. However, there are many women on numerous websites, chat rooms, newsgroups and support groups that are more than eager to share their long-term side effects of GnRH drugs, specifically Lupron Depot. The following

are quotes from letters of correspondence with Emily Page, an Endometriosis Support Group Leader in St. Petersburg, Florida who is an Awareness Committee Member of the Endometriosis Research Center, regarding her experiences with Lupron. Her first sentence is in reference to the initial worsening of symptoms:

> "Some women recover after that and have a pain free next few months, but for many of us, things only get worse after the first shot. I'm actually currently involved in a class action law suit against TAP Pharmaceuticals (makers of Lupron) in an effort to get it off the market. I've basically spent the last year trying to recover from the side effects. I suffered almost 20 side effects by the time my treatment was over (a total of 4 shots, couldn't handle any more than that) including: hot flashes, night sweats, mood swings, weight loss, acne, joint pain, no sex drive, excruciatingly painful sex, hair loss, memory loss, headaches, TMJ, vaginal dryness, tremors in my hands and legs, heart palpitations, blurred vision, dizziness, etc. Some of the side effects were annoying but manageable, others were crippling. I'd take endo pain over that any day."
>
> " I [had] SEVERE nausea. As in, I lost about 15 pounds on it in a month because I couldn't eat. And I was not overweight to begin with, so I looked way too thin. I could gag down slim fasts and other liquids, but that's about it. It was rough."
>
> "The thing about Lupron, is that I was basically okay the first month aside from the hot flashes and night sweats. About halfway through the 2nd month my body started going haywire. By the 4th month I was in pure hell. And I took addback therapy the ENTIRE time. I tried one kind for the first three months and a different kind for the last month. And a year later I'm still having problems that started while I was on it. And, the addback did nothing to help the vaginal dryness, by the way….I know women who are now having seizures after having been on Lupron. It's not something to be taken lightly."

Obviously, with problems such as seizures and a class action lawsuit against the makers of Lupron, there is a little more going on with these drugs than most western medical doctors will admit.

Though many doctors use these drugs, most of the experts in the field do not like to waste time and money on them (they are very expensive: Lupron is around $450 per month), considering they do not cure, they only delay symptoms while creating possibly detrimental side effects. For example, Drs. Lyons and Albee at the Center for Endometriosis Care in Atlanta, GA do not prescribe Lupron and other GnRH drugs at all except in very severe cases, and then only after surgery (Albee 4).

Surgery is a route that most endometriosis patients have to take at least once, and many women have as many as 4 or 5 surgeries before their symptoms become manageable. In the past, it was thought that removal of the uterus and one or both ovaries would "cure" endometriosis, since menstruation as well as production of estrogen would cease. However, it is now becoming clear that not only does hysterectomy not always take care of the pain and symptoms of endometriosis (Ballweg 130), it is usually not necessary. If a doctor were to remove the organs, and not the lesions and scar tissue, pain would likely still continue, since the lesions will still react to any estrogen replacement therapy taken, as well as, to a lesser extent, to estrogen created in other parts of the body, such as adrenal glands, muscle, skin and fat. The endometriosis on the bowels and bladder would still be there, causing problems just as before (Ballweg 130-31).

Assuming one has access to a skilled surgeon who is willing and able to excise (remove) all scar tissue adhesion, lesions and cysts that are visible, and even those that are microscopic, through the laparoscope, if at all possible, one will likely have better pain management and preservation of organs than with such radical surgery as hysterectomy (Albee 4). This is known as Aggressive Conservative Surgery, as opposed

to Radical Surgery, which is removal of the reproductive organs and Very Conservative Surgery, in which the surgeon treats only the largest and most obvious lesions and cysts. In this case, the tissue may not be removed, but cauterized or laser ablated on the surface and cysts may merely be aspirated (drained), which leaves a good chance for the walls to be filled with fluid once again. This type of surgery is not as effective as actual excision. Deeper disease and smaller lesions are left behind, to grow and cause more problems. As explained by Dr. David Redwine on the video documentary Endometriosis: The Inside Story, the challenge for endometriosis patients is that there are very few doctors who are willing to take the time to learn the very fine surgical techniques necessary for recognizing and removing all of the adhesions and scar tissue of endometriosis, while doing as little damage to pelvic organs and structures as possible. This type of surgery, though more effective than others, is difficult to learn, difficult to perform, time consuming and labor intensive. Unless the doctor becomes an endometriosis specialist, performing this type of surgery pays far less than other practices such as obstetrics or fertility treatments. If a patient does have access to a specialist, usually the cost is prohibitive.

Alternative Western Treatments for Endometriosis

Alternative western treatments for endometriosis are very similar to those for PMS focusing on diet, stress reduction and relaxation techniques. Dietary therapies focus on encouraging production of series 1 and series 3 prostaglandins by taking LA and GLA supplements, found in Evening Primrose oil, Borage oil, nuts and seeds. Fish oil is also recommended. There are also suggestions for decreasing estrogen levels through supporting the liver to detox excess estrogen. This process is assisted by taking B-

complex vitamins, eating less fatty meats, increasing fiber intake, reducing exposure to dioxins and PCB's, especially avoiding PCB contaminated fish, eating organic foods, and avoiding dairy products. Other supplements suggested are Magnesium to help relax smooth muscle contraction, Selenium which has been shown to decrease inflammation in some endometriosis patients, Vitamin E, which inhibits the series 2 prostaglandins and strengthens the immune system, as well as Vitamin A which also improves immune function during times of stress, and Vitamin C which is a natural anti-histamine, detoxifier and wound healer. Zinc is important for inflammatory autoimmune diseases.

Among many other Western herbs recommended for female reproductive hormone imbalances is the Chaste Berry, or Vitex. For a full description of this herb, and its actions, please see the Appendix at the end of this paper.

Eastern Treatments for Endometriosis

TCM does not differentiate endometriosis from other diseases with similar symptoms, such as primary dysmenorrhea, pelvic inflammatory disease, ovarian tumors, uterine myomas and gastrointestinal disorders such as irritable bowel syndrome. Some Chinese doctors say that if treatment of dysmenorrhea produces no results, one should suspect endometriosis, pointing to how difficult it is to treat this disease (Maciocia 259).

The following is a table of some of the possible TCM patterns that may account for endometriosis, taken from Obstetrics and Gynecology in Chinese Medicine, by Giovanni Maciocia (Ob 239-256).

Dysmenorrhea	**Qi Stagnation**	**Blood Stasis**	**Stagnation of Cold**	**Damp-Heat**	**Qi and Blood Deficiency**
Main Complaint	Lower abdominal pain during and before the period, distention of the abdomen and breasts, dark menstrual blood without clots,	Intense, stabbing pain before or during menses, dark blood with large clots	Lower abdominal pain before or after menses, centrally located, relieved by application of heat, scanty bright-red blood with small dark clots	Hypogastric pain before menses, sometimes on mid-cycle, burning sensation extending to sacrum, feeling of heat, blood red with small clots	Dull hypogastric pain toward the end of or after menses, dragging sensation in lower abdomen, pain relieved by pressure and massage, scanty bleeding
Other Symptoms	PMS, irritability	Mental restlessness, pain relieved after passing clots.	Feeling of cold and sore low back	Vaginal discharge, scanty, dark urine	Pale complexion, tiredness, slight dizziness, loose stools.
Tongue/ Pulse	Tongue is normal or slight red on sides. Pulse is choppy or wiry	Tongue is purple. Pulse is wiry	Tongue is pale-bluish or bluish purple. Pulse is deep, choppy or deep, tight.	Tongue is red with sticky yellow coat. Pulse is slippery.	Tongue is pale, pulse is choppy.
Treatment Principle	Move Qi and Blood, eliminate stagnation, stop pain	Invigorate Blood, eliminate stasis, stop pain	Warm the uterus, expel cold, invigorate blood	Clear heat, resolve dampness, eliminate stasis.	Tonify Qi, strengthen Spleen, nourish Blood.
Points	Liv-3, Ren-6, GB-34, St-29, Sp-14, 10, 8, 6, 4, Pc-6	See previous, plus Kid-14, St-25	Lu-7, Kid-6, Ren-4, 6, St-29, Sp-8, 6, St-36, St-28	Sp-9, 6, Lu-7, Kid-6, Ren-3, St-28, UB-32, 22, Ren-9, LI-11, Sp-10, Lid-2, Liv-3.	Ren-4, 6, St-36, Sp-6, 8, 10, UB-20, 54, 32
Herbal Formulas	Xiao Yao San	Tao Hong Si Wu Tang	Wen Jing Tang	Qing Re Tiao Xue Tang or Er Miao San	Sheng Yu Tang or Ba Zhen Yi Mu Tang

Again, as with PMS, TCM offers many different treatments for different types of dysmenorrhea, all of which address the root causes and treat the entire manifestation, with comparatively little expense, and no side effects. However, even TCM may have difficulty getting significant results with severe cases of this disease, and many debilitated patients may find that TCM works best once excisional surgery has been performed, in order to prevent and slow the recurrence of disease. Either way, acupuncture and herbs are a much safer and more cost effective alternative to drugs and surgery, and worth a try for severe endo before resorting to more invasive means, or as an adjuctive therapy.

In conclusion, whether viewed from a western or an eastern medical perspective, the female reproductive system and its cycles are very complex and reproductive health depends on a delicate balance of hormones or energies, depending on which perspective you look from. This paper covered only 2 of the many problems that women commonly face with regard to their menstrual or hormonal cycles and changes; others include infertility, menopause, difficult pregnancy, and miscarriage. TCM treatments for PMS and Endometriosis are often more numerous, and more effective than Western treatments. you look from. This paper covered only 2 of the many problems that women commonly face with regard to their menstrual or hormonal cycles and changes; others include infertility, menopause, difficult pregnancy, and miscarriage. TCM treatments for PMS are often more numerous, and more effective than Western treatments.

APPENDIX

The Legendary Chaste Berry

Chaste Berry (*Vitex agnus castus*), also known as Monk's Pepper, or Vitex, has been written about from as far back as ancient Greece, during the time of Homer, in the 6th century B.C.E. It was believed to protect people against evil, as well as decrease the libido of both men and women, used by temple priestesses, monks and priests to subdue sexual desire (hence the names Chaste Berry and Monk's Pepper). It was also used in Egypt, and is still sold at bazaars as an agent to calm hysteria (Balch 140, Gladstar 257).

Vitex is an aromatic deciduous tree native to Greece, Italy, China and the Western Asian mainland. The fruit, which has a pepper-like quality of taste and aroma, is harvested in the autumn, when the berries are ripe red in color, and dried for storage and use (Lininger 467, Rister 93).

Aside from its famous use to quell passion, historically it was also used to treat hemorrhage following childbirth, assist with discharging retained placenta, treat diseases of the uterus, and has been used in China to relieve headaches, painful, red or swollen eyes, and to harmonize Liver Qi since the 6th century A.D. (Lininger 467, Rister 93).

Today we find Vitex listed in the Chinese Materia Medica as Man Jing Zi (*Vitex rotundifolia L.* or *V. Trifolia L.*). It is cool in nature with acrid and bitter taste, entering the Bladder, Liver and Stomach channels. It is used to treat headache and eye complaints due to externally contracted Wind-Heat invasion or Liver channel wind-heat. It is also used as an auxiliary herb for treating Wind-Damp Bi Syndrome (Bensky & Gamble 44).

Western research has revealed many medicinal qualities and practical applications of Vitex. Most research on the herb is done on the entire fruit, not yet isolating the

effects of the individual constituents. It contains essential oils (limonene, cineole and sabinene), iridoid glycosides (agnuside and aucubin) and flavoniods (castican, orientin and isovitexin). It is also reported to contain delta-3 ketosteroids in the flowers and leaves, which also contain progesterone and hydroxyprogesterone as well as testosterone and epitestosterone (Brown). It has a normalizing effect on the reproductive system. Unlike most other herbs used to regulate hormones, it does not do this directly by affecting estrogen receptor sites. It regulates female hormones by stimulating the pituitary gland to produce more luteinizing hormone, which, in turn, stimulates the ovaries to produce more progesterone (Gladstar 257, Rister 93). According to Gladstar, at the same time, it inhibits the release of follicle stimulating hormone, which, in turn decreases estrogen production (257). In this way, it restores estrogen/progesterone balance. Yet, according to Rister and Balch, it increases both progesterone and estrogen production (93, 140). The author on Herbs 2000 suggests that since the herb works on problems stemming from opposing hormonal imbalances (such as PMS and menopausal symptoms), that the chaste tree should be considered an adaptogen, working to balance whatever hormonal imbalance may be present. Nonetheless, it is said by all sources to treat painful and irregular menstruation, infertility, PMS, menopausal symptoms, acne, hyperprolactinemia, insufficient lactation, ovarian cysts as well as endometriosis (Gladstar 257, Rister 93, Balch 140). One research study showed its effects on PMS to be stronger than those of Vitamin B6, which has been celebrated for its alleviation of such symptoms (Lininger 467).

It should not be taken during pregnancy, and, in fact, can aid the birthing process (Gladstar 257). Its use during lactation is controversial. Historically it was used to

stimulate lactation, and is still recommended by Gladstar and Rister for regulating prolactin (a hormone necessary for breast-milk production) levels in mothers with insufficient lactation (257, 93). However, research also points to Vitex decreasing the levels of prolactin (Balch 140). Again, it is likely an adaptogen type of regulator, striking a 3-way balance between estrogen, progesterone and prolactin (Brown).

In men, Vitex decreases sperm and testosterone production and causes the testicles to atrophy, and so should not be taken unless the man has prostate cancer, in which case the Vitex theoretically slows the growth of prostate cancer cells (Balch 140).

Vitex does not act quickly, and should be used long term for hormonal regulation. For chronic issues such as irregular menses, endometriosis and infertility, it may need to be taken for a year or longer (Gladstar 257). For PMS and heavy periods, one should notice a difference in 4 to 6 months (Lininger 467). It is also recommended that it be taken in the morning and that one continues the herb for 3 months following resolution of the problem (Balch 140).

Side effects may include multiple egg release from the ovaries, possibly resulting in multiple births. Increased menstrual flow is not uncommon (Brown). Minor gastrointestinal disturbance and mild skin rash have appeared in rare cases (Rister 93, Lininger 467). Balch does not recommend combining Vitex with the birth control pill, or that Vitex be taken by women with estrogen sensitive cancers, such as breast, cervical or uterine cancers. No other sources list this caution.

All sources agree that Vitex is a safe and promising way to regulate female hormonal levels and correct problems associated with estrogen/progesterone imbalance.

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