

**RESULTS: SALIVA HORMONE TEST**

Accession #: 100076543 • Patient: Jane Smith

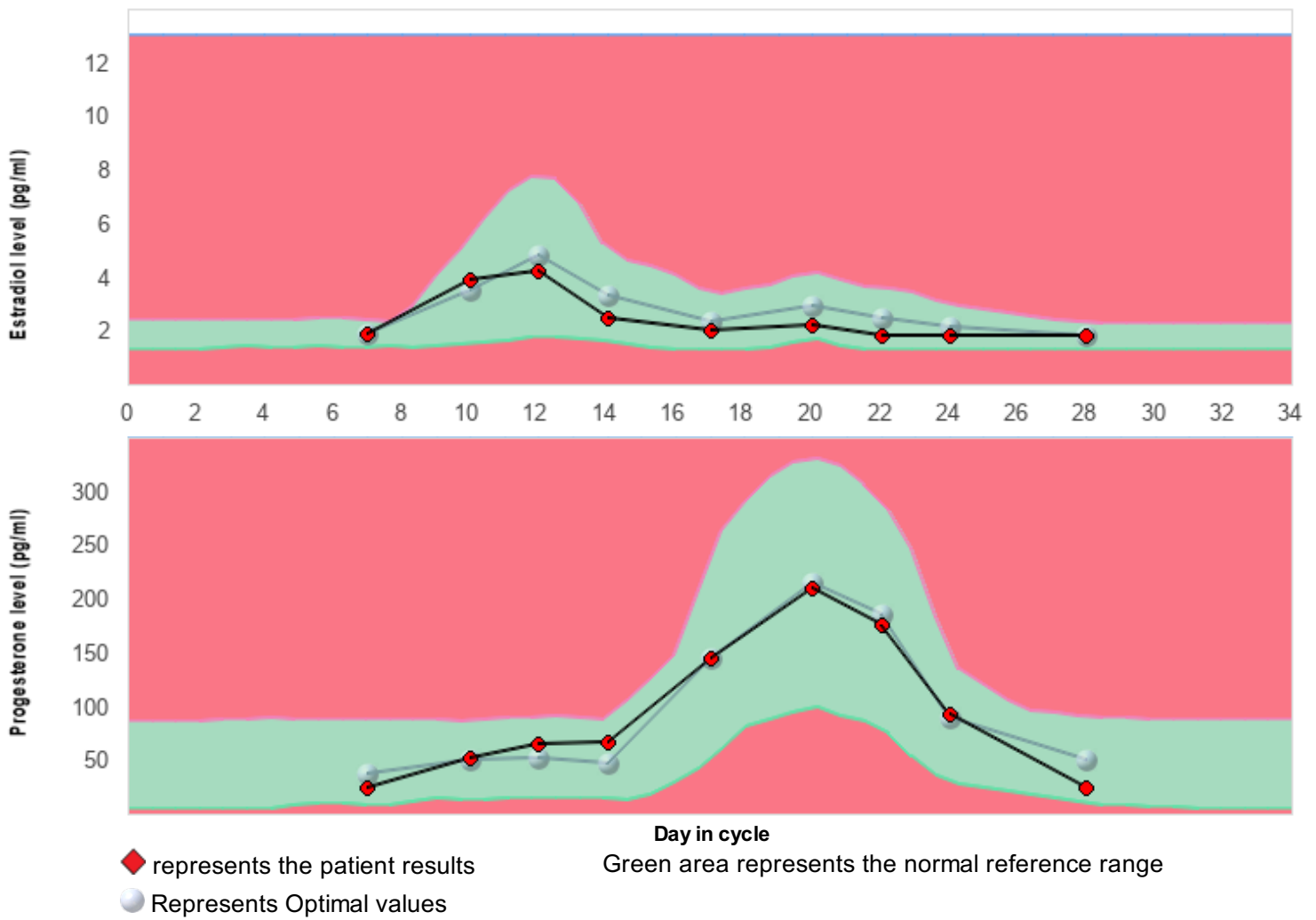
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**Patient:** Jane Smith  
**Tel:** (123) 454-6789      **Email:** test@test.com  
**Sex:** Female      **Age:** 25 yr      **Date of Birth:** 1999-09-09  
**Height:** 5 ft 1 in      **Weight:** 105 lbs      **Waist size:** 30 in  
**Menstrual status:** Regular      **1st day of last menses:** Month 02, Day 15  
**Hormones:** Yes, please see next page.  
**Health Care Professional:** John Smith  
**Address:** 340 March Road #400, Ottawa, Ontario K2K 2E4

**Accession #:** 100076543  
**Sample received:** 2025-03-05  
**Report issued:** 2025-03-05  
  
**Date of first collection:** 2025-03-01

**MENSTRUAL CYCLE MAPPING**
**RESULTS (pg/ml)**

Day in cycle	07	10	12	14	17	20	22	24	28	Avg.
<b>Estradiol</b>	1.9	3.9	4.2	2.5	2	2.2	1.8	1.8	1.8	<b>2.46</b>
<b>Progesterone</b>	24.6	52.5	65.1	67.5	145	210	175	92	24.6	<b>95.1</b>



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**REFERENCE RANGES (pg/ml)**

17-β ESTRADIOL (E2)		
Female		Reference range
21-50 years	Follicular phase	1.3 - 7.8
	Peak on Day:	12
	Luteal phase	1.2 - 8.4
51-75 years	Post Menopausal	0.6 - 4.4
Male		1.0 - 4.7

PROGESTERONE (Pg)		
Female		Reference range
	Follicular phase	19.6 - 86.5
	Peak on Day:	20
	Luteal phase	99.1 - 332.6
	Post Menopausal	6.0 - 56.4
Male		12.7 - 65.1

**HORMONE USE**

Hormone Type	Brand or Source	Delivery	Last Used (Date)	Amount (mg)	Times/Day	Days/Month
<b>Estrogens</b>	Alora	Oral	02-20-2025	2	3	4
<b>Progesterone</b>	Amen	Oral	02-20-2025	2	3	4
<b>Testosterone</b>	AndroGel	Oral	02-20-2025	2	3	4
<b>DHEA</b>	Intrarosa	Oral	02-20-2025	2	3	4
<b>Thyroid</b>	Synthroid	Oral	02-20-2025	2	3	4

**Other** Promensil

\* = Not Entered

The reference range is derived from a normal distribution of results that encompass 95% of randomly selected individuals in a population.

Analysis performed by Rhein Consulting Laboratories, F.J. Nordt, Ph.D., Director, 4475 SW Scholls Ferry Road, Suite 101, Portland, OR 97225, USA  
 CLIA # 38D0676504/OR #350

## Menstrual Cycle Mapping Interpretation

The comments provided here are for educational purposes only. The results in this report should not be interpreted as diagnostic, nor should they be viewed as treatment recommendations. Those decisions are the responsibility of the health care professional.

### General Comments

The present report shows this individual's cycle map, as well as a reference range for each day, with a statistical interval representing 95%, or 2 Standard Deviations (2 S.D.), of the reference population. In all of these maps, whether for estradiol or progesterone, the horizontal axis represents the days in a cycle. The vertical axis provides the salivary hormone concentration of estradiol or progesterone, in pg/ml. The **FLUIDS iQ Menstrual Cycle Mapping** uses 9 samples, ensuring that there are sufficient measurements to pick up the estradiol and progesterone peaks within the monthly cycle. Also note that the reference ranges shown in this report are based on samples from morning saliva collection

**Normal Cycle:** The hormonal output during a normal menstrual cycle consists of a rising estradiol (E2) level in the follicular phase, with a maximum reached just prior to ovulation. A moderate level is then maintained during the luteal phase, with a rise in the mid luteal phase that is much lower than seen in the follicular. In contrast, the progesterone (Pg) levels are low during the follicular phase, but increase dramatically after ovulation, in the mid-luteal phase, finally dropping to a low level by the end of the cycle (Fig. 1). Any disruption in this pattern may lead to various hormonal imbalances and some of the resulting clinical abnormalities noted below.

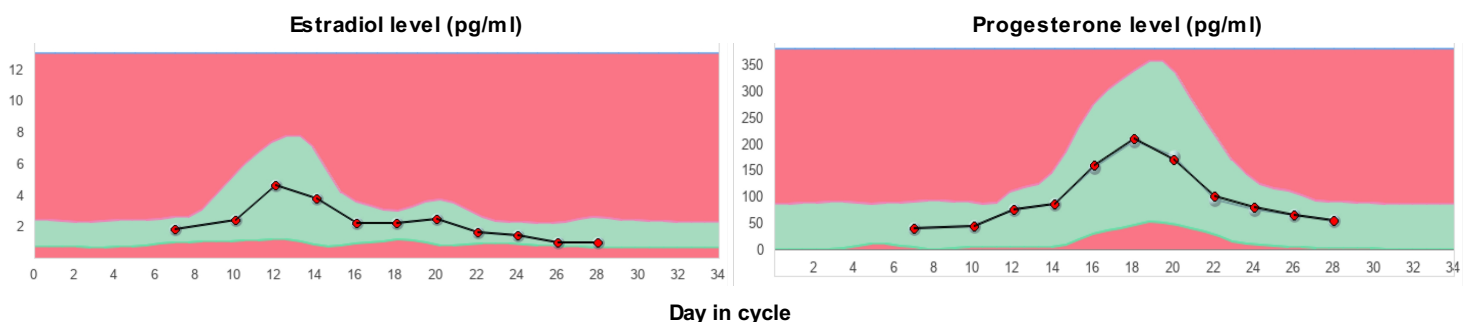


Figure 1: Normal Cycle

Testing the reproductive hormones in a single day 'spot' test, during the luteal phase, is sufficient for most menstruating women. However, for a significant number of women, an accurate clinical portrait is not possible without determining the hormonal output throughout a month-long menstrual cycle. For these women the FLUIDS iQ 'Menstrual Cycle Mapping' is most often done to help determine the reasons for some of the following: Difficult menstrual symptoms, cases of PMS/PMDD (see below), or for fertility abnormalities. This testing is not meant for women on birth control therapy, for those using hormone supplementation, or for those who are post-menopausal.

There is ample evidence showing that hormonal imbalances can be the underlying cause of many chronic health issues, including menstrual cycle imbalances, such as those shown below. The **FLUIDS iQ Menstrual Cycle Mapping** is important in assessing the following:

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• **Irregular Cycles:** May be short (Fig. 2) or long (Fig. 3), or irregular from month to month.

- **A) Short Cycle:** An individual's cycle length may vary from the normal 28-31 days to very short (15-20 days), short (21-24), or medium (25-28). When the cycle is normally short, it is likely not clinically relevant. However, if there is a sudden cycle shortening, to less than 24 days, it may be due to the following:
  - stress
  - extreme weight loss or gain
  - hyper or hypothyroidism
  - perimenopause (onset of menopause)
  - uterine fibroids or cysts
  - birth control

A short period can also be an early sign of pregnancy. Note that light bleeding can often be mistaken for a short period.

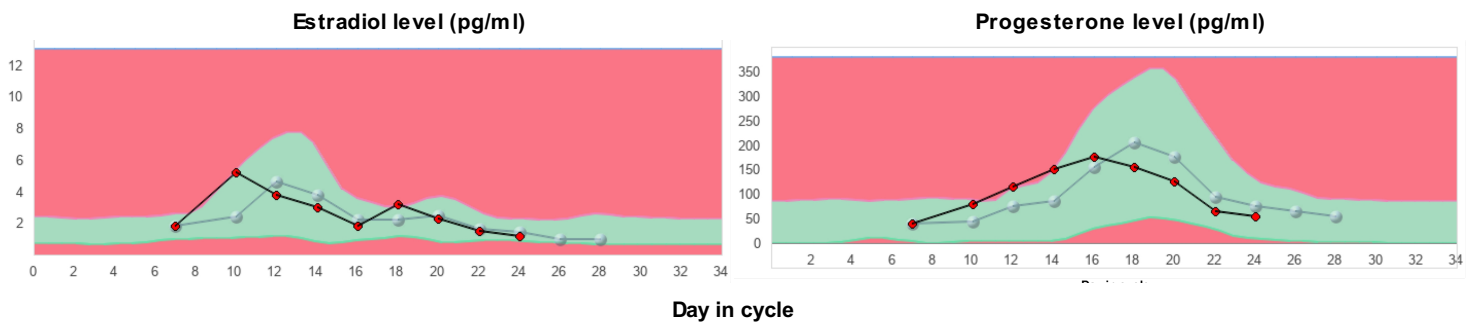


Figure 2: Short Cycle

- **B) Long Cycle:** Individuals with cycles longer than 35-40 days are considered as having a 'long cycle'. It indicates that the individual may not be ovulating, and one of the commonest causes for this would be a polycystic ovarian disease, such as polycystic ovarian syndrome (PCOS). A diagnosis of PCOS is made when there are at least 2 of the following three; irregular periods, increased levels of androgen and polycystic ovaries. For the first few years after menstruation begins, long cycles are common. However, menstrual cycles tend to shorten and become more regular as people age. Apart from PCOS, long cycles may be caused by a number of other underlying conditions: Hormone and ovulation changes, Medications, Pregnancy, Uterine fibroids or polyps, Thyroid condition, Obesity.

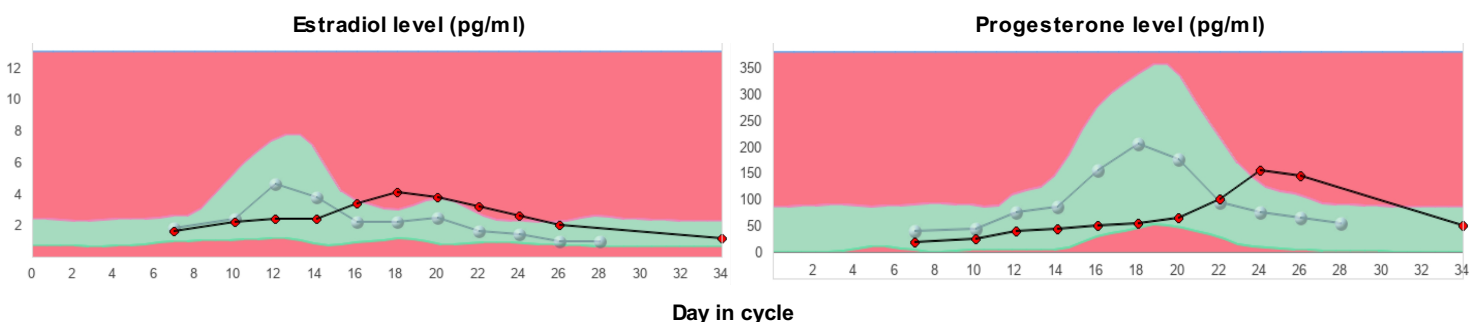


Figure 3: Long Cycle

- **Luteal Phase Deficiency:**

In luteal phase deficiency the luteal phase may shift from month-to-month. Women who suffer from this deficiency may exhibit lower than normal estrogen peaks, possibly leading to the production of an egg that does not mature properly. Ovulation is often later than normal, which is manifested by an estradiol rise later in the follicular phase of the cycle. The luteal phase is shorter than normal, and the progesterone 'peak', in the luteal phase, may be at a level much lower than normal and closer to the time of ovulation. (Fig. 4). This luteal abnormality is one of the most common causes of infertility.

A luteal deficiency occurs when a woman's ovaries fail to release sufficient progesterone, or when the uterine lining doesn't respond to progesterone. Women suffering a luteal phase deficiency will also tend to have lower luteinizing hormone and estrogen peaks, which indicate "weak" ovulation, as when the follicle producing the egg does not mature properly.

A luteal phase deficiency can be caused by the following:

- Endometriosis (lining, similar to the uterus, growing outside the uterus)
- Excessive exercise
- Anorexia
- Polycystic Ovary Syndrome (PCOS)
- Obesity
- Thyroid disorders
- Stress

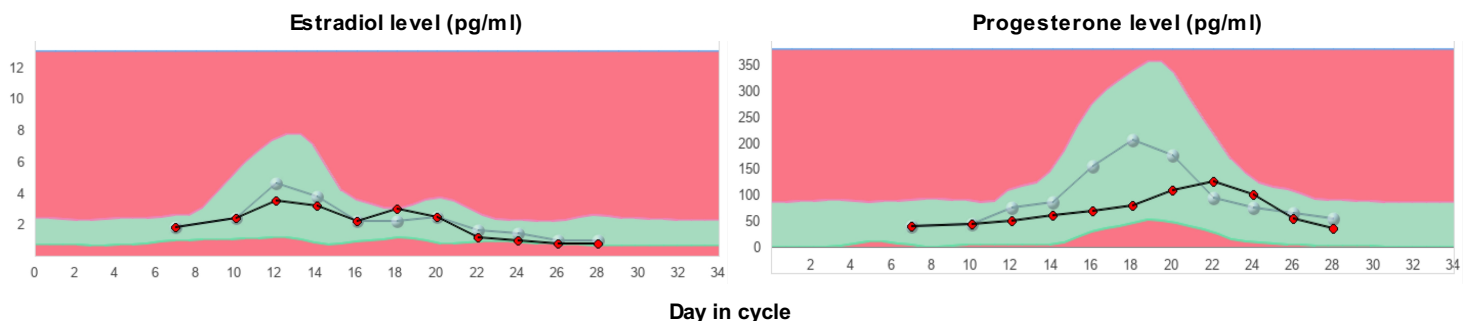


Figure 4: Luteal Phase Deficiency

- **Anovulation:**

Anovulation occurs when an egg does not release, or ovulate, from a woman's ovaries. When ovulation does not occur, Luteinizing Hormone (LH) levels are consistently elevated. LH is a hormone secreted by the anterior pituitary gland that stimulates ovulation and development of the corpus luteum. Unlike what one expects to see in a normal ovulatory cycle, in those with anovulation the estrogen levels stay low, with no surge. Progesterone levels are also consistently low (Fig. 5). Testing helps health professionals determine if a woman has an adequate LH surge to induce ovulation. It also gives a clear indication of when the luteal phase is beginning.

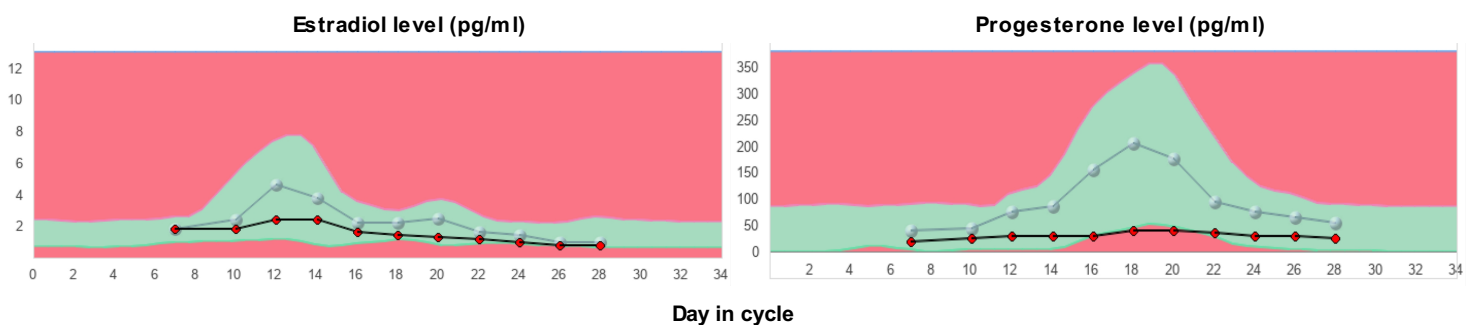


Figure 5: Anovulation

- **Partial Hysterectomy:** Also called a supra-cervical hysterectomy, this surgical procedure removes only the uterus, leaving behind the cervix. It stands in contrast to a Radical Hysterectomy, where there is removal of the uterus, cervix and upper part of the vagina. This latter procedure is usually done for cancer treatment. With a Partial Hysterectomy there are cycling hormones, but no menses.
- **Premenstrual Syndrome (PMS):** PMS represents a group of physical and behavioral symptoms that some women experience every month, after ovulation and before the start of their menstrual period. It is thought that PMS happens in the days after ovulation because estrogen and progesterone levels begin falling dramatically when there is no pregnancy. PMS has a wide variety of fluctuating signs and symptoms throughout the cycle, including mood swings, tender breasts, food cravings, fatigue, irritability and depression. It is estimated that as many as 3 of every 4 menstruating women have experienced some form of premenstrual syndrome. Menstrual Cycle Mapping highlights the deficiency or excess of estrogen and/or progesterone, at key points in the cycle, and helps to get at the root cause of these hormone-related symptoms.
- **Premenstrual Dysphoric Disorder (PMDD):** This health problem is similar to premenstrual syndrome (PMS), but with more severe symptoms. PMDD causes severe irritability, depression, or anxiety in the week or two before the period begins. Symptoms usually go away two to three days after the period starts.

## Hormonal Action and the Menstrual Cycle

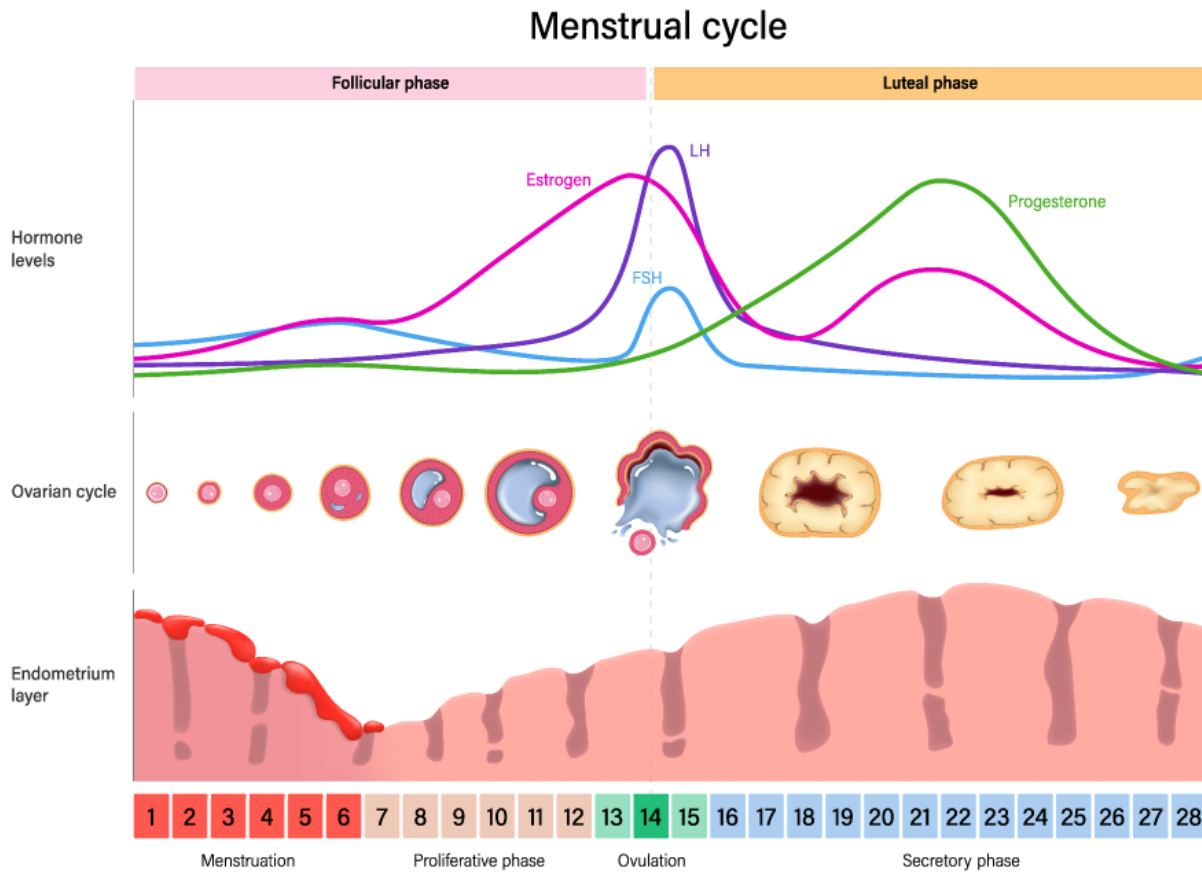


Figure 6

An optimal 28-day cycle begins with the 'follicular phase', which represents the first half of the cycle, and normally extends from days 1 to 14 (Fig 6). This is followed by ovulation, or 'mid-cycle', which may last from 1 to 3 days. This mid-cycle then leads into the 'luteal phase', or second half of the cycle, which lasts until menses. In individuals with atypical cycle lengths, these phases may shift. Progesterone and estradiol are the major hormonal regulators of reproduction in females, and it is the fluctuations of these hormones that define key events that occur during the menstrual cycle (Fig. 6).

### Follicular Phase:

During the early part of the follicular phase, the pituitary derived follicle stimulating hormone (FSH), stimulates the ovarian follicles to produce estradiol. The estradiol then suppresses FSH. There is a short spike in concentration at the ovulation phase, due in part to stimulation from progesterone. This short rise in FSH is thought to free the developing egg (oocyte) from follicular attachments. In the follicular phase of an optimal 28-day cycle, estradiol rises and peaks between days 10-14, curbing menstruation and thickening the uterine lining (endometrial proliferative phase), while maturation of the follicles begins in the ovaries.

Towards the end of the follicular phase the estradiol level peaks, which then causes pituitary stimulation and a resulting surge in luteinizing hormone (LH), which in turn triggers ovulation. Ovulation occurs 24-36 hours after estradiol reaches its peak level and 10-12 hours after the surge in luteinizing hormone (LH) from the brain. In fact, ovulation may be defined as the culmination of both high estradiol and high LH levels.

### **Luteal Phase:**

After ovulation, the follicle, which is responsible for release of the egg, is transformed into the corpus luteum. The latter secretes high amounts of progesterone (endometrial secretory phase). It is during the luteal phase, and if fertilization has occurred, that progesterone begins the secretory changes in the uterine lining in preparation for the arrival of the fertilized egg. During the early luteal phase there is also suppression of LH production, which will only increase again in the ovulatory phase of the following cycle. There is a secondary rise in estradiol levels during the luteal phase, but this rise is much less than in the follicular phase. Progesterone levels are at their highest during the luteal phase, peaking 5-7 days after the start of the luteal phase and diminishing towards the end of the menstrual cycle, unless there is egg fertilization. If progesterone does not rise it indicates that the individual is most likely not ovulating. If egg fertilization does occur, the corpus luteum continues to secrete progesterone, which in turn maintains the thickened uterine lining during pregnancy.

It should be noted that normal cycles may range from 24-34 days. The follicular phase may vary in length, but the luteal phase has much lower variation.

## **Estradiol and Progesterone in the Menstrual Cycle**

### **Follicular Phase**

#### **Estradiol**

Low estradiol levels can occur with ovarian dysfunction, low body mass, chronic stress, normal aging and the use of oral contraceptives.

High estradiol levels play a role in menstrual irregularities and conditions related to estrogen dysfunction, such as endometrial hyperplasia, ovarian cysts and uterine fibroids.

#### **Progesterone**

Low progesterone levels may occur in ovarian aging

High progesterone levels may occur when there is a residual corpus luteum remaining from the previous cycle. It may be accompanied by prolonged bleeding or Polycystic Ovary Syndrome (PCOS).



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**Luteal Phase:****Estradiol**

Low estradiol levels may be due to chronic stress, inflammation, low body mass and ovarian insufficiency.

High estradiol levels are found in individuals with a high body mass index and hypothyroidism. Elevated levels can be a contributing factor to conditions such as dysmenorrhea, PMS and abnormal uterine bleeding.

**Progesterone**

Low progesterone levels are encountered with anovulation, luteal defects, chronic stress and medications such as oral contraceptives. Low levels are often seen in women as they approach menopause, and progesterone deficiency in the luteal phase is known to be one of the leading causes of infertility and abnormal uterine bleeding.

High progesterone levels may be seen in some forms of PMS. These elevated levels can also be due to transdermal progesterone supplementation.