

## Preventive Powers of Ovulation and Progesterone

### What is Ovulation?

*by Dr. Jerilynn C. Prior, Scientific Director, Centre for Menstrual Cycle and Ovulation Research.*

This question is at the heart of the Centre for Menstrual Cycle and Ovulation Research (CeMCOR). It is also what makes CeMCOR unique. Because CeMCOR focuses on ovulation, rather than simply on menstruation, it has the potential to make new discoveries for women.

Over the next several issues of the new CeMCOR Newsletter, I will be focusing on different aspects of the question about the importance of ovulation for women's health. This article will start by asking what we now know about how frequently ovulation occurs or doesn't in women with menstrual cycles.

Before I get into that, however, let me say what I believe:

***Regular menstrual cycles with consistently normal ovulation during the premenopausal years will prevent osteoporosis, breast cancer and heart disease in women.***

*So, what do we mean by ovulation?*

Ovulation literally means the release of an egg from the ovary. That is a key event that leads to pregnancy and the birth of a baby. However, ovulation is also important as the process that leads to production of the menstrual cycle's second important hormone—progesterone. It is the latter meaning of ovulation, having to do with the process of releasing an egg and the production of progesterone that is key, I believe, for women's health.

A complex system must be coordinated to allow release of an egg. As is appropriate, that coordination begins in the brain. It would not be prudent, for example, for a woman who was in severe emotional distress, starving or ill to become pregnant. For that reason, I think that regular ovulation tells us a lot about that woman's personal environment, social context and health. I called ovulation the "bellwether of women's well being" (meaning predictor of women's whole health) when awarded a Research Lectureship by the University of British Columbia Faculty of Medicine in 2002.

*What might cause disturbances in ovulation?*

A woman must be in good emotional, nutritional and social health to regularly ovulate. It makes sense that a woman who is under emotional stress is less likely

to ovulate. For example, student nurses in Japan were shown to ovulate less frequently during their school year, that was full of deadlines and exams, than during their summer break [\(1\)](#). Even the worry that what we eat will cause us to gain weight (called cognitive dietary restraint) is a big enough stress in normal weight premenopausal women that their stress hormone level, cortisol, is higher than in other similar women who aren't restrained [\(2\)](#). Those women with eating restraint also had disturbed ovulation (they didn't ovulate, called "anovulation" or they ovulated but with too short a time from ovulation to the next flow, called "short luteal phase" cycles) [\(3;4\)](#).

It also makes sense to not become pregnant if you are starving! Therefore, someone who is not starving but who is eating fewer calories than she burns will also have a subtle change in her menstrual cycle—she'll have disturbed ovulation [\(5\)](#). If she is losing a lot of weight, the period may stop all together.

Being seriously ill will also disturb women's (and men's) reproduction. For example, older menopausal women who were admitted to the hospital or the intensive care unit with pneumonia or acute heart attack showed low levels of the pituitary hormone, follicle stimulating hormone (FSH), when first admitted [\(6\)](#). As their health improved over about two weeks, FSH levels rose to the normal, high levels of a menopausal woman [\(6\)](#).

What about exercise? Everyone knows that marathon-training women lose their periods. Right? Wrong! And also wrong to blame the changes that may occur in exercising women on the exercise without considering stress and not eating enough. In fact, I was so angry at the notion that women who ran long distances would inevitably develop "athletic amenorrhea" that I began studying women's menstrual cycles back in 1980! I did a study with two women who kept track of their weights, periods, ovulation and length of the luteal phase as well as how much they ran over a full year. One was trying to become pregnant. The other was training for her first marathon. Both started with normal menstruation and ovulation and experienced multiple short luteal phase or anovulatory menstrual cycles, but neither lost her period. The woman who wanted to become pregnant did when she gained weight by cutting back her exercise [\(7\)](#). The other woman ran her first marathon and after that decreased her running—her luteal phase length, because she had adapted to her exercise, was normal while running 3-5 miles a day [\(7\)](#).

This is the start of a series of articles on this topic. We will discuss how soon after the first period ovulation begins, how scientists decide if a woman is ovulating, and what we know (or don't know) about ovulation in women in the general population. Eventually this newsletter will cover the important issues like how ovulation is important for bone health, prevention of breast and other women's cancers, and for

protection against heart disease.

Stay tuned! The next installment of this article will appear in the next edition of this newsletter.

*Reference List for "Is Ovulation (and are normal Progesterone levels) Important for the Health of Women?"*

1. Nagata I, Kato K, Seki K, Furuya K. Ovulatory disturbances. Causative factors among Japanese student nurses in a dormitory. *J.Adolesc.Health Care* 1986; 7: 1-5.
2. McLean JA, Barr SI, Prior JC. Cognitive dietary restraint is associated with higher urinary cortisol excretion in healthy premenopausal women. *Am.J.Clin.Nutr.* 2001; 73: 7-12.
3. Barr SI, Prior JC, Vigna YM. Restrained eating and ovulatory disturbances: possible implications for bone health. *Am.J.Clin.Nutr.* 1994; 59: 92-7.
4. Barr SI, Janelle KC, Prior JC. Vegetarian versus nonvegetarian diets, dietary restraint, and subclinical ovulatory disturbances: prospective six month study. *Am.J.Clin.Nutr.* 1994; 60: 887-94.
5. Loucks AB, Thuma JR. Luteinizing hormone pulsatility is disrupted at a threshold of energy availability in regularly menstruating women. *J Clin Endocrinol Metab* 2003; 88(1): 297-311.
6. Warren MP, Siris ES, Petrovich C. The influence of severe illness on gonadotropin secretion in the postmenopausal female. *J Clin Endocrinol Metab* 1977; 45: 99-104.
7. Prior JC, Ho Yeun B, Clement P, Bowie L, Thomas J. Reversible luteal phase changes and infertility associated with marathon training. *Lancet* 1982; 1: 269-70.

*Originally published March 2008*