

# The Facts about Menstruation and Running

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*A number of old wives' tales have percolated down the years on this subject: "My mother says I mustn't have a bath, go swimming or running while I have my period..." This is nonsense!*

A female athlete's performance may depend on the phase of the menstrual cycle she is in. The menstrual cycle ranges from 21 to 35 days and is rarely the often-quoted 28 days, and comprises of three phases: menstrual phase (menses), pre-ovulatory phase and the

post-ovulatory phase.

The menstrual phase is the periodic discharge of 25 to 65ml of blood, tissue fluid etc and lasts for approximately 2 to 9 days. The exact timing of the menarche is affected by genetic, racial, socio-economic and climatic factors.

Stress can either shorten or lengthen the menstrual cycle.

All sport is a stress, and usually lengthens it. Females, who go to altitude to compete or train, have an added stress due to the lack of oxygen, which usually shortens the cycle. It is important for a sportswoman and her adviser to know what is going on in her body and at what stage the cycle is at.

## Hormones and PMS – a matter of timing?

Oestrogen and progesterone are steroids. It is the pre-menstrual fall in these that, in some women, cause the phenomena of pre-menstrual syndrome (PMS). However, while both decline to the 14th day, progesterone climbs to a peak on the 20th day and it is that this hormone is the major cause of PMS.

The sportswoman and her coach have for many years searched for the ideal time in the menstrual cycle when performance will be at its peak. They have equally searched for natural ways of neutralising any psychological and physical handicaps caused by PMS and the actual period.

Some research in 1993 (Menstrual Cycle Phase and Running Economy, Medicine and Science in Sports and Exercise, Vol. 25(5), pS74, 1993) goes some way towards solving part of the equation. Eight fit, normally menstruating females were asked to run at intensities of 55% and 80% VO<sub>2</sub> max during different stages of their menstrual cycles.

This intensity approximates to 70% and 88% of the maximal heart rate, respectively. The mid-luteal phase of the cycle (about a week after ovulation, i.e. a week before actual menstruation), turned out to be a time when exercise became more difficult and psychological health took a nosedive (depression, fatigue and confusion increased while feelings of vigour declined).



However, the lactate threshold – the exercise intensity above which large amounts of lactate begin to accumulate in the blood – was not influenced by the menstrual cycle phase. In further research, eight female distance runners were asked to run at close to top speeds for short periods of time and also ran as far as possible at an intensity of 85% VO<sub>2</sub> max, about 90% of maximal heart rate.

None of the variables measured – VO<sub>2</sub> max, blood lactate, lactate threshold, maximal heart rate and fat oxidation – were different at any stage of the menstrual cycle.

### **Glycogen storage**

For unknown reasons, the mid-luteal phase is a potentially low-performance time for female competitors. But there is a bonus side to this phase – it is a potent time for muscle glycogen storage in the legs.

Recent research reveals that glycogen storage is 22% higher in the leg muscles of females in the mid-luteal phase, compared to before ovulation, and total endurance performance – measured as the ability to continue pedaling a bicycle at an intensity of 70% VO<sub>2</sub> max (marathon pace) tended to be about 10% greater!

This suggests that female marathoners should seek a marathon race during this phase because the added glycogen store in the legs could lead to increased speed over the final 10 km. But, the exact opposite is the case if a speedy activity is contemplated, such as a swimming, cycling or running sprint event.

The ideal time for these is the two weeks before ovulation, when economy and mood are better and ventilation isn't so expansive.

However, non-menstruating sportswomen and those who are taking oral contraceptives, which usually provide low, steady doses of progesterone, don't have a normal mid-luteal phase, and therefore do not have to worry about negative psychological and physical changes.

### **The effect of sport**

Physically active women increase their chances of changes to their menstrual cycle. These include irregular cycles (oligomenorrhea) or complete cessation of the cycle (amenorrhea). In the general population amenorrhea occurs in 2 to 5% of women of reproductive age, whereas for women participating in sport it can be as high as 40%.

## The dangers of preventing menstruation

Generally speaking, a girl's body fat content has to reach about 17% before menstruation will begin. All athletes need to be aware of the factors that can result in oligomenorrhea or amenorrhea. Athletes are prime candidates for this condition as they are likely to experience:

- \* heavy training loads
- \* high stress levels from trying to manage their training programmes with work and family life
- \* as a result of the training, body weight may reduce and the fat level may fall below 17% for some months



The medical profession is divided over this condition – on the one hand, one school of thought forecasts infertility if this is prolonged. On the other hand, another view is that it is nature's way of telling the female she is too thin to have children.

But the non-appearance of menstruation has been strongly linked with osteoporosis (weakening of the bones) and possible chronic undermining of bone structure. Amenorrhea reduces the body's capacity to absorb calcium, decreases bone density and increases the risk of musculoskeletal injury in vigorous exercise.

A high calcium intake is recommended in such cases, of around 1,200mg daily. Good dietary sources are: milk, cheese, broccoli, legumes, green, leafy vegetables, nuts, seeds, peas, beans and lentils. Because milk is associated with many allergic reactions with some people, it should not be relied upon as the main calcium source.

A new finding is that an obscure mineral – boron, found in fruits and nuts – if lacking in the diet, will hamper calcium metabolism. Also implicated in calcium absorption is the mineral manganese, a glass of pineapple juice two or three times a week will suffice. It should be noted that nuts provide all three minerals (calcium, boron and manganese).

There is little doubt that taking the contraceptive pill not only eradicates or alleviates many of the unwelcome incidents of PMS, but can be used to manipulate the menstrual cycle so that a period does not occur at the same time as a major sporting event.

However, where endurance events are concerned, its major drawback is weight gain, fluid retention and a major cancelling out of the entire vitamin B complex. The first two are unwanted handicaps in any activity that continues for more than an hour. The last will affect carbohydrate absorption which is the main fuel for physical activity. A diminution of vitamin B12's role will reduce the manufacture of new red blood cells. None of these is a happy state of affairs for the keen sports woman.

## Dealing with PMS

While there are some drugs available to alleviate PMS, and also period pain, many of them also affect performance by interfering with the Krebs Cycle (the conversion of energy in to oxygen), in particular, the barbiturates.

Research suggests that PMS sufferers cannot efficiently metabolize the essential fatty acid, linoleic acid – which is mainly found in good quality vegetable oils – into its normal by-products, possibly because of the subtle interaction between derivatives of linoleic acid and certain

menstrual hormones.

This barrier could occur because of dietary deficiencies of nutrients essential for its conversion which include: vitamin B6, magnesium, zinc, vitamin C, vitamin B3 and chromium. Research has shown that countries with a high intake of fruit and vegetable produce tend to have a lower incidence of PMS.



Poor blood sugar control (chromium helps with this) is often a problem in women with PMS. Many notice an increase in appetite and/or food or sugar craving in the week or so before the period, and this may contribute to their weight gain and fluid retention.

The following treatments are either proven or accepted by a significant number of medical experts:

- \* Limit the consumption of refined sugar, salt, red meat and alcohol
- \* Eat fish, poultry, whole grains and legumes as major sources of protein and rely less on red meat and dairy produce.
- \* No smoking
- \* Minimal amounts only of coffee, tea, chocolate, and cola-based drinks.
- \* Avoid saturated fats (animal fats, fried food and butter).

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- \* Eat plenty of complex carbohydrates (fruit, all kinds of vegetables).
- \* Train in the morning in order to keep weight down.
- \* If sugar and food craving is experienced, eat every 4 hours on the dot only; nuts, seeds, peas, beans and lentils, fish and eggs (all high quality protein foods).
- \* Take a multivitamin supplement providing the RDA of all the vitamins and most of the minerals, especially magnesium.
- \* Evening Primrose oil – 500mg capsules, 4-8 per day, taken during the two weeks before the period is due, but if not effective it should be tried throughout the month.

Warning: If symptoms do not improve or are very severe, a doctor must be consulted.

## Impact on training

The hardest time to race efficiently, for athletes experiencing a menstrual cycle, is during the week before menstruation and a week after ovulation. At these times increased levels of progesterone simulate the brain's respiratory centre increasing ventilation rates (progesterone is also linked to the mood swings). Athletes use breathing rate as an indicator of exercise intensity so exercise can tend to feel harder at these times.

The time of maximum efficiency for athletes experiencing a normal 28 day menstrual cycle might be pre-ovulation (days 9-12) or post-ovulation (days 17-20).