

### **What are hormones?**

Hormones are chemical substances formed in organs and glands that travel through the body via the blood stream. They control many biologic processes such as muscle growth, heart rate, hunger, and menstrual cycle. Steroid hormones include the three major sex hormone groups: estrogens, androgens, and progesterones. All three are present in both men and women, but in different amounts.

### **What do the sex hormones do?**

Sex hormones have several functions. Primarily, they control and maintain our reproductive systems. They also have an influence on muscle mass, bone strength, and behaviour. Sex hormones begin to influence brain function before birth, as early as a month or two after conception.

### **Is there a connection between seizures and hormones?**

Yes, although we do not understand it very well. We know that the female hormones, estrogen and progesterone, act on certain brain cells, particularly those in the temporal lobe, a part of the brain where partial seizures often begin. Estrogen excites these brain cells and can make seizures more likely to happen. In contrast, progesterone can inhibit or prevent seizures in some women.

### **Are all seizures caused by hormone changes?**

No, but some women with epilepsy do experience changes in their seizure patterns at times of hormonal fluctuations. For example, puberty is a time when hormones are stimulating body changes. It is not unusual for certain kinds of seizures to disappear at puberty, while other seizure disorders may start at this time. Many women with epilepsy see changes in the number or the pattern of their seizures around the time of ovulation (mid-cycle), or just before and at the beginning of their menstrual periods

### **Why do I have seizures more often around the time of my menstrual period?**

This is a condition called “catamenial epilepsy,” and describes a tendency for increased seizures related to the menstrual cycle. In some women, seizures occur most frequently just before menstruation, during the first few days of menstruation and at mid-cycle, during ovulation. The causes of catamenial epilepsy are not understood very well. The balance between the two female sex hormones, estrogen and progesterone, may be disturbed, or you may not be producing enough progesterone during the second half of your menstrual cycle. It is also possible that the amount of anti-epileptic drug (AED) circulating in your bloodstream may decrease before menstruation.

### **Why do women with epilepsy often have more reproductive disorders than women without seizures?**

Women with seizures that start in the temporal lobes of the brain seem more likely to have reproductive disorders such as polycystic ovaries, early menopause, and irregular (or no) ovulation, than women in the general population. The temporal lobes are closely connected to, and communicate with, areas of the brain that regulate hormones (hypothalamus and pituitary gland.) Seizures in these areas may affect normal production of hormones. Certain epilepsy medications seem to interfere with hormone regulation.

### **Do men have hormone-sensitive seizures, too?**

In men, hormonal fluctuations are less obvious. However, their hormones also influence brain function, and may have an effect on seizure frequency. Occasionally, men will also experience a cyclical pattern in their seizures that may be related to hormones.

### **Why is it important to find out if hormone changes are involved in my seizures?**

For both women and men, identifying hormonal influences on seizure patterns may lead to a better understanding of treatment options for seizure control. Women should keep a calendar of their menstrual cycles and of days they have seizures. It is important to keep track of other factors that may affect the menstrual cycle or seizure patterns, such as missed medication, loss of sleep, unusual fatigue, intense physical training, stress or an illness. Some women may find it helpful to keep track of the lowest body temperature of the day (taken each morning before getting out of bed, and before eating the first meal of the day.) This helps to find out if you are ovulating regularly. Be sure to share these records with your doctor or the nurse who is helping you manage your seizures.

### **How do I find out if I have hormone-related problems?**

If you suspect that hormones play a role in your seizures, talk to your physician or the nurse who helps monitor your seizures. Blood tests of certain hormone levels and of your seizure medication may provide helpful information. Sometimes additional tests, such as a pelvic ultrasound, may be recommended to rule out other causes for menstrual irregularities.

### **I think my seizures have something to do with hormones. Should I see a specialist?**

Most people who have well-controlled seizures are treated by a primary care doctor. But women who have special concerns about seizures and hormones need referral to a neurologist. A neurologist who specializes in seizures is called an epileptologist. A neuroendocrine specialist is a neurologist with training in hormone disorders and their effects on brain function. These physicians are usually found at hospitals or health care centers with programs devoted to epilepsy treatment, often called Comprehensive Epilepsy Centers.

### **Where can I get more information about epilepsy and hormones?**

Contact the Women and Epilepsy Initiative of the Epilepsy Foundation. It is dedicated to improving the care of women with seizures. Information about the Women and Epilepsy Initiative is available from the Foundation at 1-800-EFA-1000 or through the Epilepsy Foundation Web Site: <http://www.efa.org>.

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