Estrogen Metabolism
Information for Patients

Advancing the Science of Wellness
Rocky Mountain Analytical

Estrogen Metabolites

Estrogens are released into the bloodstream and bind to hormone receptors. Once displaced from receptors, estrogens are broken down via several different pathways and eliminated in the urine. These breakdown products are called metabolites.

2-hydroxyestrone

- Estrogens broken down via the 2-hydroxy pathway end up having little or no estrogenic effect, and so do not 'feed' cancer cells that depend on estrogen for growth.
- The main metabolite measured is 2-hydroxy-estrone (2-OHE1), although small amounts of other 2-hydroxyestrogens may also be measured.
- Several studies suggest that 2-OHE1 may actually inhibit estrogen-induced cancer growth.

16-hydroxyestrone

- Estrogens broken down via the 16-alpha-hydroxy-estrone (16-OHE1) pathway are more potent estrogens and may therefore promote growth of hormone dependent cancers. Standard tests for cancer-causing potential show 16-OHE1 can alter genetic structure of cells.

About the Estrogen Metabolism Ratio

Estrogens are hormones produced in both men and women. Estrogens circulating in the blood eventually get broken down by the liver into estrogen metabolites, which are eliminated in urine. There are several different pathways estrogen can take on its way out of the body. Two or the major metabolic pathways are: 2-hydroxyestrone (2-OHE1) and 16-alpha-hydroxyestrone (16-OHE1). Research shows that a ratio of 2-OHE1 to 16-OHE1 in urine of greater than 2.0 is associated with a lower degree of severity, or risk of developing certain diseases. Maintaining a healthy balance in favour of 2-hydroxyestrogens may help preserve good health.

The Estrogen Metabolism Ratio can be used to help women and men assess their risk of the following conditions associated with imbalances in the breakdown of estrogens.

Conditions Associated with Estrogen Metabolism Imbalance

Breast Cancer
Several studies show that women diagnosed with breast cancer have a lower ratio of 2-OHE1 to 16-OHE1 than age-matched disease-free women.

Cervical dysplasia
Cervical dysplasia is a condition where pre-cancerous cells are found in the cervix. Studies show the severity of the dysplasia is greater in women with a lower Estrogen Metabolism Ratio.

Recurrent Respiratory Papillomatosis (RRP)
RRP is a condition where non-cancerous tumors grow on the larynx, vocal cords, and trachea. Studies show the severity of RRP increases with a lower Estrogen Metabolism Ratio.

Prostate Cancer
Men with prostate cancer are significantly more likely to have a low Estrogen Metabolism Ratio than disease-free men.

Why Test the Estrogen Metabolism Ratio?

- Because a number of health conditions (see above) are affected by the ratio of 2-hydroxyestrone to 16-hydroxyestrone; your Estrogen Metabolism Ratio may give some indication of your relative risk of developing these conditions.
- Knowing you are at increased risk for certain hormone-related conditions may provide motivation to make healthier lifestyle choices.
- The Estrogen Metabolism Ratio test is simple to do. A single urine sample is tested and measurements of both 2-OHE1 and 16-OHE1 are made. The ratio of 2-OHE1 to 16-OHE1 is plotted on a bar graph with the favourable range highlighted in green.

Why Test?

Good health has a lot to do with maintaining balance; the right balance of work and play, the right balance of nutrients in the diet, and the right balance of hormones and hormone breakdown products.

Too much of the wrong kind of estrogen may increase your risk of disease. The Estrogen Metabolism Ratio helps identify your risk of developing hormone related cancers like breast and prostate cancer.

Rocky Mountain Analytical is committed to offering laboratory tests that identify hormone imbalances and other health issues - so they can be corrected before disease develops!

About Rocky Mountain Analytical

Rocky Mountain Analytical is an accredited medical laboratory located in Calgary, Alberta. We started in 2002 with saliva hormone testing, and have been growing steadily ever since.

Introduced in 2009, our hair element analysis test helps assess nutritional status, and exposure to toxic elements.

Ask your health care provider for more information about this or any other Rocky Mountain Analytical test.

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Improving Your Estrogen Metabolism Ratio

A number of supplements and lifestyle changes can be used to raise the Estrogen Metabolism Ratio (EMR). Unfortunately, there is no definitive proof that increasing the ratio now guarantees a reduced risk of developing hormone related diseases later. However, we do know from population studies that men and women with higher ratios of 2-OHE1 to 16-OHE1 are much less likely to develop certain hormone related diseases. We also know that many of the supplements, foods and lifestyle changes that raise EMR have documented health benefits. Therefore, it is reasonable to assume that adding these food/supplements and making lifestyle changes will reduce risk of disease.

Supplements: There are a number of natural products that help improve the Estrogen Metabolism Ratio. Indole-3-carbinol (I3C), Di-indolylmethane (DIM), flaxseed, omega-three fatty acids, soy isoflavones and oil of rosemary all increase 2-hydroxyestrone levels, thereby raising the EMR.

In addition, prescription progesterone and prescription thyroid hormone have been shown to improve the Estrogen Metabolism Ratio.

Exercise: Levels of the 'bad' metabolite 16-OHE1 go up with obesity, therefore weight loss and exercise are important factors in regulating the EMR.

Lifestyle: Exposure to toxins can increase levels of the 'bad' metabolite 16-OHE1, which lowers the EMR, so it is important to minimize exposure to toxic chemicals. Excessive alcohol consumption may also lower the EMR.

Diet: Increased consumption of cruciferous vegetables like broccoli, Brussels sprouts, cabbage and cauliflower can raise the EMR by increasing the amount of the 'good' metabolite, 2-OHE1. Increasing dietary fibre and reducing consumption of saturated fats also helps raise the EMR.

Test Results

- Maintaining an Estrogen Metabolism Ratio of 2.0 or higher may provide some protection against hormone related cancers. In some cases, an EMR of 2.0 may not be high enough. Your health care practitioner can help you determine what is a good ratio for you.
- Note that treatment decisions are based on the ratio of the two metabolites, not on individual measurements of either 2-OHE1 or 16-OHE1. The amount of 2-OHE1 or 16-OHE1 that is produced and eliminated varies widely throughout the menstrual cycle in women and from patient to patient, depending on kidney function and fluid consumption. Therefore, decisions must be based on the absolute ratio between the two.