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HORMONE THERAPY

Information and pictures from *National Cancer Institute* unless otherwise specified

Quick Summary of Section

Hormone therapy

- Hormone therapy is a cancer treatment that removes hormones or blocks their action and stops cancer cells from growing. Hormones are substances made by glands in the body and circulated in the bloodstream.

Breast Cancer & Drugs used

Pink Ribbon Program®

- Tamoxifen
- Arimidex
- Herceptin

Prostate Cancer

- What are male sex hormones?
- How does hormone therapy work against prostate cancer?
- What types of hormone therapy are used for prostate cancer?

Hormone Therapy

Hormone therapy is a cancer treatment that removes hormones or blocks their action and stops cancer cells from growing. Hormones are substances made by glands in the body and circulated in the bloodstream.

- Some hormones can cause certain cancers to grow. If tests show that the cancer cells have places where hormones can attach (receptors), drugs, surgery, or radiation therapy is used to reduce the production of hormones or block them from working.

Hormone therapy is used to

- Treat cancer. Hormone therapy can lessen the chance that cancer will return or stop or slow its growth.
- Ease cancer symptoms. Hormone therapy may be used to reduce or prevent symptoms in men with prostate cancer who are not able to have surgery or radiation therapy.

Types of hormone therapy

- Hormone therapy falls into two broad groups, those that block the body's ability to produce hormones and those that interfere with how hormones behave in the body.

Who receives hormone therapy?

- Hormone therapy is used to treat prostate and breast cancers that use hormones to grow. Hormone therapy is most often used along with other cancer treatments.
- The types of treatment that you need depend on the type of cancer, if it has spread and how far, if it uses hormones to grow, and if you have other health problems.

How hormone therapy is used with other cancer treatments

- Range of scores for the Decipher test showing low, intermediate, and high risk of prostate cancer metastasis
- Genetic Test May Help Predict Whether Prostate Cancer Will Spread
- The test may help determine whether to treat with hormone therapy.

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<p>Hormone Therapy Continued</p>	<p>When used with other treatments, hormone therapy can</p> <ul style="list-style-type: none"> • Make a tumor smaller before surgery or radiation therapy. This is called neoadjuvant therapy. • Lower the risk that cancer will come back after the main treatment. This is called adjuvant therapy. • Destroy cancer cells that have returned or spread to other parts of your body. <p><i>(Hormone Therapy to Treat Cancer – NCI)</i></p>
<p>Hormone therapy Breast Cancer</p>	<ul style="list-style-type: none"> • The hormone estrogen, which makes some breast cancers grow, is made mainly by the ovaries. Treatment to stop the ovaries from making estrogen is called ovarian ablation. • Hormone therapy with tamoxifen is often given to patients with early localized breast cancer that can be removed by surgery and those with metastatic breast cancer (cancer that has spread to other parts of the body). Hormone therapy with tamoxifen or estrogens can act on cells all over the body and may increase the chance of developing endometrial cancer. Women taking tamoxifen should have a pelvic exam every year to look for any signs of cancer. Any vaginal bleeding, other than menstrual bleeding, should be reported to a doctor as soon as possible. • Hormone therapy with a luteinizing hormone-releasing hormone (LHRH) agonist is given to some premenopausal women who have just been diagnosed with hormone receptor positive breast cancer. LHRH agonists decrease the body's estrogen and progesterone. • Hormone therapy with an aromatase inhibitor is given to some postmenopausal women who have hormone receptor positive breast cancer. Aromatase inhibitors decrease the body's estrogen by blocking an enzyme called aromatase from turning androgen into estrogen. Anastrozole, letrozole, and exemestane are types of aromatase inhibitors. • For the treatment of early localized breast cancer that can be removed by surgery, certain aromatase inhibitors may be used as adjuvant therapy instead of tamoxifen or after 2 to 3 years of tamoxifen use. For the treatment of metastatic breast cancer, aromatase inhibitors are being tested in clinical trials to compare them to hormone therapy with tamoxifen. • In women with hormone receptor positive breast cancer, at least 5 years of adjuvant hormone therapy reduces the risk that the cancer will recur (come back). • Other types of hormone therapy include megestrol acetate or anti-estrogen therapy such as fulvestrant. <i>NIH NCI (17)</i>

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<p>Tamoxifen</p> <p>Arimidex</p> <p>Herceptin</p> <p><i>Pink Ribbon Program®</i></p>	<p>Tamoxifen was approved for treating breast cancer more than two decades ago. The standard treatment used to last 5 years but researchers have found that taking tamoxifen for 10 years produced more reductions in breast cancer recurrence and death than taking tamoxifen for 5 years.</p> <ul style="list-style-type: none">• Tamoxifen: slows cancer growth by blocking estrogen-positive receptor sites. Some breast cancers are spread through estrogen. These are classified as estrogen-positive cancers.• By blocking the estrogen receptors, the drug slows or stops the growth of cancer cells that are already present in the body. Needs to be taken for 5 years after surgery/treatment. <p>Side effects:</p> <ul style="list-style-type: none">• Menopause• Fatigue• Weight Gain• Hot Flashes• Depression• Osteoporosis due to menopause• Endometrial Cancer (cancer of the lining of the uterus)• Uterine sarcoma (cancer of the connective tissue of the uterus)• Pulmonary embolism (blood clot in the lung)• Deep vein thrombosis(blood clot in a major vein) <p>Arimidex is an aromatase inhibitor, which reduces the body's production of estrogen. An aromatase inhibitor is a drug that blocks aromatase, an enzyme needed to make estrogen.</p> <ul style="list-style-type: none">• Prescribed for post-menopausal women only• Prescribed after Tamoxifen• Has less side effects –• Joint pain is a significant side effect <p>Herceptin: Some breast cancers make excessive amounts of a protein called human growth factor receptor 2 (HER2), which helps breast cancer cells grow and survive.</p> <ul style="list-style-type: none">• Trastuzumab is a biological class of drugs known as monoclonal antibodies. It blocks HER2 and cause the cancer cells to die.• For women with HER2-positive breast cancers, the drug Herceptin has been shown to dramatically reduce the risk of recurrence.• It has now become standard treatment to give Herceptin along with adjuvant (after-surgery) chemotherapy in those with metastatic breast cancer.• Herceptin has far fewer immediate side effects than chemotherapy -- for example, there is usually no nausea or hair loss.• However, it causes muscle weakness and there is a small but real risk of heart damage (cardiac dysfunction) and possible lung damage.• Some other adverse effects has been reported as anaphylaxis and severe dyspnea, allergic or hypersensitivity reactions, hematological toxicity hepatic and renal toxicity, diarrhea and an increased risk of infections. <i>Pink Ribbon Program®</i>
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Hormone Therapy Prostate Cancer	<p>What are male sex hormones?</p> <ul style="list-style-type: none">• Hormones are substances that are made by glands in the body. Hormones circulate in the bloodstream and control the actions of certain cells or organs.• Androgens (male sex hormones) are a class of hormones that control the development and maintenance of male characteristics. The most abundant androgens in men are testosterone and dihydrotestosterone (DHT).• Androgens are required for normal growth and function of the prostate, a gland in the male reproductive system that helps make semen. Androgens are also necessary for prostate cancers to grow. Androgens promote the growth of both normal and cancerous prostate cells by binding to and activating the androgen receptor, a protein that is expressed in prostate cells (1). Once activated, the androgen receptor stimulates the expression of specific genes that cause prostate cells to grow (2).• Almost all testosterone is produced in the testicles; a small amount is produced by the adrenal glands. Although prostate cells do not normally make testosterone, some prostate cancer cells acquire the ability to do so (3). <p>How does hormone therapy work against prostate cancer?</p> <ul style="list-style-type: none">• Early in their development, prostate cancers need androgens to grow. Hormone therapies, which are treatments that decrease androgen levels or block androgen action, can inhibit the growth of such prostate cancers, which are therefore called castration sensitive, androgen dependent, or androgen sensitive.• Most prostate cancers eventually stop responding to hormone therapy and become castration (or castrate) resistant. That is, they continue to grow even when androgen levels in the body are extremely low or undetectable. In the past, these tumors were also called hormone resistant, androgen independent, or hormone refractory; however, these terms are rarely used now because the tumors are not truly independent of androgens for their growth. In fact, some newer hormone therapies have become available that can be used to treat tumors that have become castration resistant. <p>What types of hormone therapy are used for prostate cancer?</p> <ul style="list-style-type: none">• Hormone therapy for prostate cancer can block the production or use of androgens (4). Currently available treatments can do so in several ways:<ul style="list-style-type: none">○ reducing androgen production by the testicles○ blocking the action of androgens throughout the body○ block androgen production (synthesis) throughout the body <p><i>(Hormone Therapy for Prostate Cancer – NCI)</i></p>
References	<p>NIH NCI (17) https://www.cancer.gov/types/breast/patient/breast-treatment-pdq#_185</p> <p>Pink Ribbon Program® https://www.pinkribbonprogram.com/</p> <p>Hormone Therapy to Treat Cancer – NCI - https://www.cancer.gov/about-cancer/treatment/types/hormone-therapy</p> <p>Hormone Therapy for Prostate Cancer – NCI - https://www.cancer.gov/types/prostate/prostate-hormone-therapy-fact-sheet</p>