



Working together for a cure

# The PCRI Glossary

**A Tool for Learning About Prostate Cancer**  
Print Version Updated February 2007

The PCRI Glossary has been an enhancement tool for many readers, allowing them to navigate through a maze of new medical terminology. The original PCRI Glossary was published in the August, 2001 issue of *PCRI Insights*.

Our online Glossary, which can be found in the [Resources](#) section of [www.pcri.org](http://www.pcri.org), contains frequent updates and it also has a feature that many of you will find helpful; it is called the "hyperlink". This will allow you to rapidly move from the definition of a word to another term that is referenced in the definition. In this print version, these linked terms are underlined in [blue](#) indicating the terms can be found within this Glossary.

We hope that expanding your medical vocabulary will make you feel comfortable when communicating with your medical providers, attending medical meetings and reading material within the PCRI Web site. Knowledge is power and your empowerment will allow you to evolve to a higher level. We invite you to suggest additions or corrections by e-mailing the PCRI at [help@pcri.org](mailto:help@pcri.org) words or terms that you feel should be included in the ongoing revision of the PCRI Glossary.

Material provided by PCRI is intended for educational purposes for discussion with your physician and should not be considered as medical advice. We have attempted to provide definitions that are reasonably accurate, yet understandable. We do not guarantee the medical accuracy of this publication.

## A Glossary of Prostate Cancer Related Terms & Abbreviations

**3 dimensional conformal radiation therapy (3DCRT):** an external radiation treatment approach that focuses on directing the radiation energy to the tumor target while sparing the surrounding normal tissues; see conformal

**5-alpha-dihydrotestosterone:** usually known as [dihydrotestosterone](#) or DHT

**5-alpha reductase (5AR):** [enzymes](#) that convert [testosterone](#) to [dihydrotestosterone](#)

**5-alpha reductase inhibitor:** A drug used to block the conversion of [testosterone](#) to [dihydrotestosterone](#). Examples: finasteride (Proscar®) and dutasteride (Avodart®).

**5-FU: 5-Fluorouracil;** (Aducil®); a drug in the group of cancer-fighting medicines known as [antineoplastics](#), which interferes with the growth of cancer cells. It is approved for [palliative](#) management of colon, rectum, breast, stomach and pancreatic cancer

**17,20 lyase:** an [enzyme](#) important in the adrenal androgen pathways that converts 17 alpha hydroxyprogesterone to [androstenedione](#) and also converts 17 alpha hydroxypregnoneolone to [DHEA](#)

### A

**a1-antichymotrypsin (ACT):** one of the many serine [protease inhibitors](#) or serpins (short for serine protease inhibitor) which are [proteins](#) that inhibit peptidases (old name: proteases). Serine proteases are defined by the presence of a serine (an [amino acid](#)) residue in their active domain.

**AAT:** androgen ablation therapy; preferred terms might be androgen deprivation therapy ([ADT](#)) or hormone therapy.

**AAWR: [antiandrogen withdrawal response](#);** a decrease in PSA seen upon stopping an antiandrogen such as Flutamide® or Casodex®; it is believed that this occurs because the antiandrogen has induced a mutation in the [androgen receptor \(AR\)](#) which is allowing the antiandrogen to stimulate PC growth rather than inhibit it

**abdomen** adj. **abdominal:** the part of the body below the ribs and above the pelvic bone that contains organs like the intestines, the liver, the kidneys, the stomach, the bladder, and the prostate

**ablation:** relating to the removal or destruction of tissue or a system; androgen ablation refers to blocking the effects of androgens by surgical or chemical means

**acinus:** pl. ACINI: any of the small saclike structures that terminate the ducts of some [glands](#), also called alveolus; ACINAR: of, relating to or comprising an acinus

**acronym:** an abbreviation formed from the initial letters of a name; e.g. see [ARM](#)

**ACTH:** adrenal corticotrophic hormone; a [pituitary](#) hormone that stimulates the outer portion of the adrenal glands to secrete various hormones including cortisol, [DHEA](#) and [androstenedione](#)

**active objectified surveillance:** active observation and regular monitoring of a patient without actual treatment ; also called watchful waiting

**acute:** beginning quickly and sharp or severe

**acute urinary retention:** the sudden inability to [urinate](#), causing pain and discomfort. Causes can be related to an obstruction in the urinary system, stress, neurologic problems, or certain medications.

**adenocarcinoma:** a form of cancer that develops from a malignant abnormality in the cells lining a glandular organ such as the prostate; almost all prostate cancers are adenocarcinomas

**adenoma:** a benign tumor of a glandular structure

**adenovirus:** a (20 sided) virus that contains [DNA](#); there are over 40 different adenovirus varieties, some of which cause the common cold. Modified versions have shown some ability to cause [apoptosis](#) in laboratory testing

**adipose:** tissue made of fat cells

**adjuvant:** an additional treatment used to increase the effectiveness of the primary therapy; radiation therapy is often used as an adjuvant treatment after a [radical prostatectomy](#) if the [surgical margins](#) are involved by PC

**ADPC (androgen-dependent PC):** PC cells that depend on [androgens](#) for continued cell growth and vitality

**adrenal androgen (AA):** a male hormone produced by the adrenal glands; actually, the adrenal makes AA precursors such as [DHEA](#) and [androstenedione](#) that are metabolized to androgens within the prostate.

**adrenal cortex:** the outer portion of the [adrenal gland](#); it secretes various [hormones](#).

**adrenal glands:** the two adrenal glands are located above the kidneys; they produce a variety of different hormones, including cortisol, adrenal [androgens](#) and [hormones](#) important in blood pressure control and electrolyte balance

**adrenalectomy:** the surgical removal of one or both [adrenal glands](#)

**Adriamycin® (doxorubicin):** a genotoxic drug, a [chemotherapy](#) agent that affects [DNA](#) and alters its function

**ADS (androgen deprivation syndrome):** a number of side effects associated with low levels of androgen associated with [ADT](#) - See [PCRI Paper on ADS](#).

**ADT:** see [androgen deprivation therapy](#)

**adverse reaction:** a harmful or unexpected effect of a medication or treatment

**aerobic:** in biochemistry, reactions that need oxygen to happen or happen when oxygen is present

**AG:** aminogluthethimide; a drug that blocks the production of [adrenal hormones](#) such as [DHEA](#), [androstenedione](#) and also cortisol

**age-adjusted:** modified to take account of the age of an individual or group of individuals; for example, it has been suggested that normal PSA values can be adjusted according to age groupings of men:

| Age   | PSA "cutoff"    |
|-------|-----------------|
| 40-49 | up to 2.5 ng/ml |
| 50-59 | up to 3.5       |
| 60-69 | up to 4.5       |
| 70-79 | up to 6.5       |

**agonist:** A drug or other chemical that can combine with a [receptor](#) on a cell to produce a physiologic reaction typical of a naturally occurring substance

**AIPC (androgen-independent PC):** PC cells that do not depend on androgen for growth

**Akt:** a [protein kinase](#) which is one of the key [enzymes](#) for regulating anti-[apoptotic](#) events

**albumin:** A class of simple, water-soluble proteins that can be coagulated by heat and precipitated by strong acids and are found in egg white, blood serum, milk, and many other animal and plant juices and tissues

**alendronate sodium :** a drug that affects bone metabolism used in treating [osteoporosis](#) and being studied in the treatment of [hypercalcemia](#) (abnormally high levels of calcium in the blood) and in treating and reducing the risk of bone pain caused by cancer; active ingredient in Fosamax®

**algorithm:** procedure or formula for solving a problem; for a set of computer programs that provide algorithms relating to prostate cancer, see the [software section](#) of [www.pcri.org](#)

**alkaline phosphatase (ALP):** an enzyme in blood, bone, kidney, spleen, and lungs; used to monitor bone or liver [metastasis](#) when elevated

**alk phos:** alkaline phosphatase

**alopecia:** loss of hair

**alpha-blockers:** pharmaceuticals that act on the prostate by relaxing certain types of muscle tissue; these pharmaceuticals are often used in the treatment of BPH; examples are Flomax®, Cardura® and Hytrin®

**alpha receptors:** a cell site that responds to adrenaline ([epinephrine](#)) or adrenaline-like substances, causing various physiological changes related to blood vessels getting smaller

**alprostadil:** a [prostaglandin](#) that relaxes the smooth muscles of the penis, enhancing blood flow, and producing erection; first produced as Caverject®, an injectable *Prostaglandin E1*

**amino:** Containing NH<sub>2</sub>; used in the context of “amino group”; see [polyamine](#)

**aminoglutethimide (Cytadren®):** an [aromatase](#) inhibitor that blocks the production of [adrenal steroids](#). It also blocks the conversion of [androgens](#) to [estrogens](#)

**amplicon:** the [DNA](#) product of a [PCR reaction](#), usually an amplified segment of a [gene](#) or DNA

**anaerobic:** an organism, such as a bacterium, that can live in the absence of atmospheric oxygen

**analgesia:** pain relief without loss of consciousness

**analgesic:** a drug that alleviates pain without causing loss of consciousness

**analog:** a synthetic chemical or pharmaceutical that behaves like a normal chemical in the body, e.g., LHRH analogs such as Lupron® or Zoladex®

**Anandron®:** trade or brand name for nilutamide, an [antiandrogen](#); in the USA this is called Nilandron®.

**anastomosis:** (pl. **anastomoses**) - the connection of separate parts of a branching system to form a network, as of blood vessels; also the surgical connection of separate or severed tubular hollow organs to form a continuous channel, as the severed [urethra](#) in [radical prostatectomy](#).

**anastrozole (Arimidex®):** an [aromatase](#) inhibitor that reduces the level of [estrogen](#) in the body

**Androcur®:** trade name for cyproterone, an antiandrogen with progestational activity; also called CPA for cyproterone acetate (not available in U.S.)

**androgen:** a hormone which is responsible for male characteristics and the development and function of male sexual organs (e.g., testosterone) produced mainly by the testicles but also in the *cortex* of the *adrenal* glands; androgens have far reaching effects on blood formation, muscle and bone mass, *cognitive* function, emotional *lability*, skin and hair, etc

**androgen dependent PC (ADPC):** PC cells that depend on androgens for continued cell growth and vitality

**androgen deprivation syndrome (ADS):** a number of side effects associated with elimination or blockage of androgens from ADT; see [PCR1 paper on ADS](#).

**androgen deprivation therapy (ADT):**(also called [hormone therapy](#)) or testosterone inactivating pharmaceuticals (TIP)) a prostate cancer treatment that eliminates or blocks androgens to the PC cell; includes diverse mechanisms such as surgical or chemical castration, antiandrogens, [5AR inhibitors](#), [estrogenic](#) compounds, agents that interfere with adrenal androgen production, agents that decrease sensitivity of the [androgen receptor](#) (AR)

**androgen independent prostate cancer (AIPC):** PC cells that do not depend on androgen for growth

**androgen receptor (AR):** A structural entity that is the site of interaction of a chemical substance called a [ligand](#) as is a lock and key; a docking site for a ligand

**androgen receptor mutation (ARM):** a mutation in the gene located on the [androgen receptor](#) that allows the [antiandrogen](#) to stimulate PC growth rather than block growth; a paradoxical effect usually occurring in about 30% of patients on long-term antiandrogen therapy in the setting of a rising PSA with a [castrate testosterone](#) level

**androstenedione:** an adrenal androgen precursor that is transformed to testosterone by 3 beta hydroxysteroid dehydrogenase within the prostate cell; testosterone can also be oxidized to androstenedione by 17 beta hydroxysteroid dehydrogenase

**anemia:** A disorder characterized by a decrease in hemoglobin in the blood to levels below the normal range. Symptoms include fatigue, weakness and difficulty breathing.

**anesthetic, anesthesia:** a drug that produces general or local loss of physical sensations, particularly pain; a “spinal” is the injection of a local anesthetic into the area surrounding the spinal cord

**aneuploid:** having an abnormal number of sets of [chromosomes](#); for example, [tetraploid](#) means having two paired sets of chromosomes, which is twice as many as normal; aneuploid cancer cells tend not to respond well to [androgen deprivation therapy](#); aneuploidy refers to the state of being aneuploid; (see also [diploid](#))

**angiogenesis:** the growth of new blood vessels; a characteristic of tumors; angiogenesis is normal biologic process that occurs in both healthy and disease states; “angiogenesis factor” or “tumor angiogenesis factor” refers to a substance that tumors produce in order to grow new blood vessels

**anorexia:** loss of appetite

**antagonist:** a drug that has an opposite reaction or competes for the same thing

**anterior:** the front; for example, the anterior of the prostate is the part of the prostate that faces forward

**anterolateral:** situated or occurring in front and to the side from the midpoint

**antiandrogen:** a compound (usually a synthetic pharmaceutical) that blocks or otherwise interferes with the normal action of androgens at cellular receptor sites

**antiandrogen monotherapy (AAM):** the use of an [antiandrogen](#) to block the [androgen receptors](#) of the cancer cells as a single therapy to reduce the side-effects normally associated with androgen deprivation therapy; [See our paper on AAM](#)

**antiandrogen withdrawal response:** see [AAWR](#)

**antibiotic:** a pharmaceutical that can kill certain types of bacteria

**antibody:** [protein](#) produced by the immune system as a defense against an invading or “foreign” material or substance (an [antigen](#)); for example, when you get a cold, your body produces antibodies to the cold virus

**anticholinergic:** an agent that blocks certain receptors on the nerves, lessens muscle spasms and reduces release of liquids by the stomach, mouth, sweat glands, etc.

**anticoagulant:** a pharmaceutical that helps to stop the blood from clotting

**antiemetic:** a medicine that prevents or alleviates [nausea](#) and vomiting

**antiestrogen:** a substance capable of preventing full expression of the biological effects of an [estrogen](#)

**antigen:** "foreign" material introduced into the body (a virus or bacterium, for example) or other material which the immune system considers to be "foreign" because it is not part of the body's normal biology (e.g., prostate cancer cells); a substance that elicits a cellular-level immune response or causes the formation of an antibody

**antigen-presenting cell (APC):** A type of cell that provokes an immune response from [T-cells](#) by binding foreign antigens to its own surface and then interacting with the T-cells. Also known as antigen-processing cell

**antineoplastic:** Inhibiting or preventing the development of abnormal tissue growth, checking the maturation and proliferation of [malignant](#) cells

**antioxidant:** a substance that inhibits oxidation or reactions promoted by oxygen or peroxides. Antioxidant nutrients protect human cells from damage caused by "free radicals" (highly reactive oxygen compounds).

**anus:** the opening of the [rectum](#) through which solid waste leaves the body

**apex, apical:** the tip or bottom of the prostate, e.g., the part of the prostate farthest away from the bladder; the top of the prostate is called the base

**apoptosis:** programmed cell death due to an alteration in a critical substance or chemical necessary for cell viability; the lack of male hormones causes apoptosis of [androgen dependent PC](#)

**arachidonic acid:** an omega-6 fatty acid that has been shown to be a stimulator of PC growth; found in egg yolk, animal red meat, organ meats; has free-radical generating properties

**Arimidex®:** the trademarked name for [anastrozole](#)

**ARM (androgen receptor mutation):** a mutation in the gene located on the [androgen receptor](#) that allows the antiandrogen to stimulate PC growth rather than block growth; a paradoxical effect usually occurring in about 30% of patients on long-term antiandrogen therapy in the setting of a rising PSA with a [castrate](#) testosterone level

**aromatase:** an [enzyme](#) that converts [testosterone](#) to [estrogen](#) (estradiol or estrone)

**arteriosclerosis:** a chronic disease characterized by abnormal thickening and hardening of the arterial walls

**ASCO:** American Society of Clinical Oncology

**aspiration:** the use of suction to remove fluid or tissue, usually through a fine needle (e.g., aspiration biopsy)

**assay:** a method of performing a standard test for the quality or quantity of a substance (ex: [PSA](#)). Assay results may vary depending on the methods, reagents and equipment used.

**ASTRO:** American Society for Therapeutic Radiation and Oncology

**asymptomatic:** having no recognizable symptoms of a particular disorder

**ATF (amino terminal fragment):** highly active part of the [uPA](#) molecule

**atherosclerosis:** a disorder of the arteries leading to reduced blood flow caused by the narrowing of blood vessels due to the accumulation of plaques composed up of [cholesterols](#) and fats

**atrophic:** undergoing atrophy or shrinkage in size and usually function

**atrophy:** a wasting or decrease in size of a body organ, tissue, or part owing to disease, injury, or lack of use: *muscular atrophy of a person affected with paralysis.* a wasting away, deterioration, or diminution: *intellectual atrophy.*

**attentive DRE:** a [DRE](#) described for [PCA3](#) test as "applying firm digital pressure to the prostate from [base](#) to [apex](#) and from the lateral to the median line for each [lobe](#) with exactly three strokes per lobe" ( Dr. Yves Fradet – AUA 2006) See PCRI Paper [PCA3: A Genetic Marker of Prostate Cancer.](#)

**atypical hyperplasia (atypia):** non typical enlargement of an organ or tissue

**AUA (American Urological Association):** the official society of American urologists

**AUA Symptom Score:** an evaluation of the lower [urinary tract symptoms \(LUTS\)](#) based on questions published by the American Urological Association - [Click here for the questionnaire.](#)

**autocrine:** of, relating to, promoted by, or being a substance secreted by a cell and acting on surface receptors of the same cell

**autologous:** one's own; for example, autologous blood is a patient's own blood which is removed prior to surgery in case a patient needs a transfusion during or after surgery

**auxotroph, auxotrophic:** mutant that differs from the wild-type (normal) in requiring a nutritional supplement beyond the minimum required for [metabolism](#) and reproduction

**Avodart®:** [dutasteride](#)

**axial:** extending in a direction essentially perpendicular to the plane of a cyclic structure

**axial spin-echo T1 weighted image:** an image acquired in the axial plane using a pulse-sequence that weights the signal intensity of each pixel to the T1 (the time it takes for

water protons to return to thermal equilibrium) relaxation of water

**azotemia:** elevation in blood nitrogen level due to dehydration or kidney dysfunction; in laboratory tests this manifests as elevation in [BUN](#) and/or [creatinine](#)

## B

**base:** the base of the prostate is the wide part at the top of the prostate closest to the seminal vesicles and bladder

**baseline PSA (bPSA):** the [PSA](#) level before a new treatment has begun; used to establish [efficacy](#) of a therapy based on response of the PSA to the treatment; can also be used in principle with any other marker, radiologic [imaging](#) study or any finding that shows [pathology](#) relating to PC

**BAT:** B-mode acquisition and targeting; an ultrasound evaluation of the prostate localizing it prior to each and every [RT](#) therapy treatment; currently used in conjunction with [IMRT](#) and mechanically integrated into the treatment program

**Bcl-2:** an [anti-apoptotic protein](#) that protects cells from programmed cell death by preventing the activation of pro-apoptotic proteins

**Benadryl®:** antihistamine often used to treat allergic reactions involving the nasal passages (hay fever) and also to treat motion sickness

**benign:** relatively harmless; not cancerous; not malignant

**benign prostatic hyperplasia or hypertrophy (BPH):** A noncancerous condition of the prostate that results in the growth of both glandular and stromal (supporting connective) tumorous tissue, enlarging the prostate and obstructing urination (see [prostatitis](#))

**benign prostatic hypertrophy (BPH):** similar to benign prostatic hyperplasia, but caused by an increase in the size of cells rather than the growth of more cells

**beta particle:** a charged particle (electron or positron) that is emitted by the decay of certain radioactive atoms

**bevacizumab (Avastin®):** an anti-[angiogenesis](#) drug used in treatment of cancer. It is used in combination with standard [chemotherapy](#) drugs in patients with [metastatic colorectal](#) cancer.

**bicalutamide (Casodex®):** a nonsteroidal [antiandrogen](#) available in the USA and some European countries for the treatment of advanced prostate cancer

**bid or b.i.d.:** to be taken twice a day (morning and evening); stands for "bis in die" (in Latin, 2 times a day)

**bilateral:** both sides; for example, a bilateral [orchietomy](#) is an orchietomy in which both [testicles](#) are removed and a bilateral adrenalectomy is an operation in which both [adrenal glands](#) are removed

**bi-mix, bi-mix:** usually refers to a mixture of [papaverine](#) and [phentolamine](#) that is injected into the penis to cause an erection.

**biochemical:** involving chemical processes in living organisms

**biochemical control:** control of a *biochemical marker*, such as an [antigen](#) (ex: [PSA](#)), [antibody](#), abnormal [enzyme](#) (ex: [PAP](#)), or [hormone](#) that is sufficiently altered in a disease to serve as an aid in diagnosing or in predicting susceptibility to the disease.

**biochemical failure:** loss of [biochemical control](#)

**biomarker:** A specific biochemical in the body which is useful for measuring the progress of disease or the effects of treatment

**biopsy (Bx):** sampling of tissue from a particular part of the body (e.g., the prostate) in order to check for abnormalities such as cancer; in the case of prostate cancer, biopsies are usually carried out under ultrasound guidance using a specially designed device known as a prostate biopsy gun; removed tissue is typically examined microscopically by a pathologist in order to make a precise diagnosis of the patient's condition. See our paper [Understanding Your Biopsy Results](#).

**bisphosphonates (BPs):** any of a group of carbon-substituted analogs (as [etidronate](#)) of [pyrophosphate](#) that are potent inhibitors of [osteoclast](#)-mediated bone [resorption](#)

**bladder:** the hollow organ in which urine is collected and stored in the body

**blastic:** having a dense appearance on a plain x-ray; associated with increased density of bone involved by prostate cancer and looking whiter on an ordinary x-ray; prostate cancer bone metastases are usually blastic; breast cancer [metastases](#) are usually [lytic](#) (showing evidence of less bone density in areas of cancer)

**blood chemistry:** measured concentrations of many chemicals in the blood; abnormal values can indicate spread of cancer or side effects of therapy

**blood count:** analysis of blood cells including white blood cells, red blood cells and [platelets](#); abnormal values can indicate cancer in the bone or side effects of therapy. See our paper [Laboratory Tests Defined](#)

**blot:** a nitrocellulose (cotton-like polymer) sheet that contains spots of immobilized macromolecules (as of [DNA](#), [RNA](#), or [protein](#)) or their fragments and that is used to identify specific components of the spots by applying a suitable molecular probe (as a complementary [nucleic acid](#) or a [radiolabeled antibody](#))

**Bluestein tables:** tables containing algorithms which use the variables [clinical stage](#), [Gleason grade](#), and [PSA](#) to predict high vs low risk for [lymph node](#) involvement with prostate cancer. See our paper [Bluestein Tables](#).

**BMD:** See [bone mineral density](#).

**bombesin:** an [amino acid peptide](#) which stimulates [gastrin](#) release

**bone marrow:** soft tissue in bone cavities that produces blood cells

**bone mineral density (BMD):** a measure of the strength of bones, [androgen deprivation](#) can cause the loss of BMD resulting in [osteoporosis](#), usually BMD is tested by dual-energy absorption x-ray ([DEXA](#)) or quantitative [CAT scan \(qCT\)](#) methods

**bone scan:** a technique more sensitive than conventional x-rays which uses a radiolabelled agent to identify abnormal or cancerous growths within or attached to bone; in the case of prostate cancer, a bone scan is used to identify bony [metastases](#) which are definitive for cancer which has escaped from the prostate; metastases appear as "hot spots" on the film; however the absence of hot spots does not prove the absence of tiny metastases

**bound PSA:** [PSA](#) molecules in the blood that are attached to other proteins

**bowel preparation:** the cleaning of the bowels or intestines that is normal prior to abdominal surgery such as [radical prostatectomy](#)

**BPH:** see [benign prostatic hyperplasia](#)

**brachytherapy:** A form of [radiation therapy](#) in which radioactive seeds or pellets which emit radiation are implanted within the prostate in order to destroy PC. See our paper [Seed Implantation for Prostate Cancer](#)

**BRM (bone resorption marker):** a laboratory test that quantifies the bone loss ([resorption](#)) occurring usually from [ADT](#) or PC; examples include Pyrilinks-D (Dpd) and N-telopeptides

**BUN:** blood [urea](#) nitrogen; a reflection of kidney function;

## C

**CAB (complete androgen blockade):** see [CHT](#)

**cachexia:** physical wasting with loss of weight and muscle mass caused by disease

**calcification:** impregnation with calcium or calcium salts. Also called *calcareous infiltration*

**calcitriol:** (1,25-dihydroxycholecalciferol) a [hormone](#) related to vitamin D that is synthesized in the liver and kidney and stimulates the intestinal absorption of calcium and phosphorus

**calcitonin:** a [hormone](#) produced by the thyroid that plays a role in regulating calcium levels

**cancer:** the growth of abnormal cells in the body in an uncontrolled manner; unlike benign tumors, these tend to invade surrounding tissues, and spread to distant sites of the body via the blood stream and [lymphatic system](#)

**CaP:** cancer of the prostate; also [PC](#), [PCa](#)

**capecitabine (trade name [Xeloda](#)):** a drug first used to treat [metastatic](#) breast cancer in patients who had not responded well to [chemotherapy](#). In some patients, capecitabine helps shrink tumor size by killing cancer

**capsular penetration:** tumor extends through the wall of the prostate

**capsule:** the fibrous tissue that acts as an outer lining of the prostate

**CaPSURE™:** (Cancer of the Prostate Strategic Urologic Research Endeavor) is a longitudinal observational study of prostate cancer patients nationwide.

**carboplatin:** a platinum based compound that is used as a cancer [chemotherapeutic](#) agent

**carcinoembryonic:** relating to a [carcinoma](#)-associated substance present in embryonic tissue, as a carcinoembryonic antigen

**carcinogen, adj. carcinogenic:** a cancer-causing substance or agent

**carcinogenesis:** the process by which normal cells are transformed into cancer cells

**carcinoma:** a form of cancer that originates in tissues that line or cover a particular organ; See [adenocarcinoma](#)

**cardiovascular:** referring to the heart and blood vessels

**carotenoid:** orange, yellow or red-colored accessory photosynthetic pigments, related to vitamin A, found in higher plants and photosynthetic bacteria

**Casodex®:** brand or trade name of [bicalutamide](#) in the USA, a non-steroidal [antiandrogen](#)

**castrate:** a level associated with what occurs after castration; traditionally surgical removal of the testicles; a castrate testosterone is defined by most physicians as less than 20 ng/ml or less than 0.69 nM/L; (nM/L x 28.8 = ng/dl)

**castration:** the use of surgical or chemical techniques to eliminate [testosterone](#) produced by the [testes](#)

**CAT Scan (CT or computerized axial tomography):** is a method of combining images from multiple x-rays under the control of a computer to produce cross-sectional or three-dimensional pictures of the internal organs which can be used to identify abnormalities; the CAT scan can identify prostate enlargement but is not always effective for assessing the stage of prostate cancer; for evaluating [metastases](#) of the [lymph nodes](#) or more distant soft tissue sites, the CAT scan is significantly more accurate

**catalyst:** a substance that increases the rate of a chemical reaction, without being consumed or produced by the reaction

**catheter:** a hollow (usually flexible plastic) tube which can be used to drain fluids from or inject fluids into the body; in the case of prostate cancer, it is common for patients to have a [transurethral](#) catheter to drain urine for some time after treatment by surgery or some forms of radiation therapy

**CBC:** complete blood count; includes the white blood count ([WBC](#)), [hematocrit](#) (HCT) and the [platelet](#) count (PLT). See our paper [Laboratory Tests Defined](#)

**CDK-1 (cyclin-dependent kinase inhibitor):** a regulator of cell growth; an [enzyme](#) inhibitor

**CDUS (color-flow Doppler ultrasound):** an [ultrasound](#) method that more clearly images tumors by observing the Doppler shift in sound waves caused by the rapid flow of blood through tiny blood vessels that are characteristic of tumors

**CEA (carcinoembryonic antigen):** a fetal [antigen](#) or [protein](#) that may be expressed by PC that is aggressive and often androgen independent

**celecoxib (Celebrex®):** an FDA-approved drug for the treatment of rheumatoid arthritis, osteoarthritis and pain; it has also been reported to block [Akt](#) function and cause the death of human prostate cancer cell lines.

**cell-mediated immunity:** Immunity dependent upon [T-cells'](#) recognition of an antigen and their subsequent destruction of cells bearing the antigen

**centigray (cGy):** 1/100 of a [Gray](#)

**CGA:** chromogranin A; a [small cell prostate cancer](#) or [neuroendocrine](#) cell marker; a progressive increase in CGA indicates an aggressive clone of PC cells that often metastasizes to [lymph nodes](#), liver and lungs

**CHB (combination hormone blockade):** also referred to as [CHT](#), MAB, TAB or [ADT](#) (androgen deprivation therapy); therapy usually involving an [LHRH agonist](#) and an [antiandrogen](#); may involve other agents such as Proscar® or [prolactin](#) inhibitors such as Dostinex®; preferred term is [ADT](#) with number attached to show number of agents e.g. ADT3 (Flutamide®, Lupron®, Proscar®) or ADT3 (FLP)

**chemoprevention:** the use of a pharmaceutical or other substance to prevent the development of cancer

**chemotherapeutic:** related to the use of [chemotherapy](#)

**chemotherapy:** the use of pharmaceuticals or other chemicals to kill cancer cells; in many cases chemotherapeutic agents kill not only cancer cells but also other cells in the body, which makes such agents potentially very dangerous

**cholesterol:** substance found in animal fats and in the human body that helps absorb and move fatty acids: cholesterol deposits can clog blood vessels leading to atherosclerosis

**choline:** a B-complex vitamin that is a constituent of lecithin; essential in the [metabolism](#) of fat

**chromatin:** the material in the center of the cell (nucleus) that forms [chromosomes](#)

**chromosome:** a threadlike linear strand of [DNA](#) and associated proteins in the nucleus of cells that carries the [genes](#) and functions in the transmission of hereditary information

**chronic:** referring to a disease or condition that develops slowly and persists over a long period of time

**CHT (combined hormonal therapy):** the use of more than one variety of hormone therapy; especially the use of [LHRH analogs](#) (e.g., Lupron®, Zoladex®) to block the production of [testosterone](#) by the [testes](#), plus [antiandrogens](#) (e.g.,

Casodex® (bicalutamide), Eulexin® (flutamide), Anandron® (nilutamide), or Androcur® (cyproterone)) to compete with [DHT](#) and with T (testosterone) for cell [androgen receptors](#) thereby depriving cancer cells of DHT and T needed for growth; also referred to as [CHB](#), MAB, TAB; the preferred term is [ADT](#)

**ciprofloxacin** (trade name **Cipro®**): an [antibiotic](#) used in various infections including urinary tract infections ([UTI](#)) and [prostatitis](#)

**circadian rhythm:** a daily rhythmic activity cycle based on a 24 hour interval

**citrate:** a salt or [ester](#) of citric acid

**clinical, clinically:** involving or based on direct observation of the patient

**clinical stage:** [staging](#) of prostate cancer as determined by the [digital rectal examination](#). See our [Clinical Stage Paper](#).

**clinical trial:** a carefully planned process by which researchers evaluate experimental new therapies and drugs through an orderly series of phases. **Phase I** trials evaluate how a new therapy or drug should be given, how often, and what dose is safe. **Phase II** trials continue to test safety but also begin to evaluate how well it works. **Phase III** trials test a new therapy or drug in comparison to the current standard of care. Participants are randomly assigned to the standard or new therapy. A placebo is only used when there is no standard therapy for comparison. Placebos are not used in Phase I or II. **Phase IV** trials are required when a drug manufacturer wishes to test an approved therapy for a different condition or with a different formulation. See [Clinical Trials](#) in Resource Section.

**clinicopathological:** relating to or concerned both with the signs and symptoms directly observable by the physician and with the results of laboratory examination

**cognitive:** of, relating to, or being conscious intellectual activity (as thinking, reasoning, remembering, imagining, or learning words)

**cohort:** a group of individuals having a statistical factor (as age or risk) in common

**collagen:** a protein consisting of bundles of tiny fibers that form connective tissue such as tendons, ligaments, bones and cartilage

**collimator:** A device used to define the size and shape of a radiation beam in [radiation therapy](#) treatment machines; A collimator typically consists of large blocks of heavy metals, such as steel or tungsten, moved by mechanical motors to define rectangular fields; see [IMRT](#)

**colon:** the part of the large intestine that extends to the [rectum](#)

**color Doppler ultrasound (CDU):** an [ultrasound](#) imaging technology utilizing sound waves that can simultaneously show blood flow superimposed on detailed gray scale anatomic images – “power Doppler” and “tissue harmonic” are enhancements to basic CDU. See our paper [Color Doppler and Tissue Harmonic Ultrasound](#)

**colorectal:** relating to the [colon](#) and [rectum](#), or to the entire large bowel (large intestine)

**combined therapy:** see [CHT](#) or [CHB](#); [ADT](#) with designation ADT1 vs ADT2 or ADT3 is preferred since this communicates the number of drugs used in the androgen deprivation therapy; ADT also more clearly communicates the mechanism of this form of treatment

**comorbidity:** a condition that exists along with and usually independently of another medical condition

**complete response (CR):** total disappearance of all evidence of disease using physical examination, laboratory studies and radiologic imaging; a criterion for evaluating the efficacy of a particular anti-cancer therapy; also see [partial response](#)

**complexed PSA:** PSA molecules which are bound to a [protease inhibitor](#) such as [a1-antichymotrypsin](#)

**complication:** an unexpected or unwanted effect of a treatment, pharmaceutical or other procedure

**concordance:** the agreement in findings that support the accuracy of a particular investigation or treatment; concordance is a critical concept in studies to diagnose, stage and treat PC

**conformal therapy:** the use of careful planning and delivery techniques designed to focus external radiation on the areas of the prostate and surrounding tissue which need treatment and protect areas which do not need treatment; three-dimensional conformal [radiation therapy \(3DCRT\)](#) is a sophisticated form of this method

**conformality:** see "Conformal Therapy"; pertaining to the ability to achieve conformal therapy.

**contracture:** scarring which can occur at the [bladder](#) neck after a radical prostatectomy and which results in narrowing of the [urethra](#) coming from the bladder; same as [stricture](#)

**contraindication:** any condition which renders some particular line of treatment improper or undesirable

**control group:** participants in a [clinical trial](#) who are receiving [placebo](#) or current standard of care for comparison to those receiving the new therapy being evaluated

**COQ10 ( coenzyme Q<sub>10</sub>):** important in cardiac function; a substance that energizes the [mitochondria](#) within the heart cells and allows them to function better; an anti-oxidant that protects LDL cholesterol from oxidation

**core:** a tissue sample removed during [biopsy](#)

**coronal:** an imaging plane bisecting the body into top and bottom parts perpendicular (rotated 90°) to the long axis of the human body

**corpora cavernosa:** two cavities in the upper portion of a man's [penis](#) that fill with blood when he is sexually excited, giving the organ the stiffness required for intercourse

**corpus spongiosum:** a spongy chamber in the lower portion of a man's [penis](#) that surrounds the urethra and fills with blood when he is sexually excited, providing additional stiffness required for intercourse

**cortex:** the outer layer of an organ, usually surrounding an inner section; the cortex of the prostate gland is also called a [capsule](#)

**cortisol:** a hormone from the outer layer of the [adrenal](#) glands

**Cowper's glands:** A pair of pea-sized glands that lie beneath the prostate gland, named after the English surgeon William Cowper (1660-1709). Cowper's glands secrete an alkaline fluid that forms part of the [semen](#). This fluid neutralizes the acidic environment of the [urethra](#), thereby protecting the sperm

**creatine:** a compound which is made by the body and is used to store energy in the form of phosphate molecules

**creatine kinase:** any of three [enzymes](#) found especially in skeletal and heart muscle and the brain that accelerate the transfer of a high-energy phosphate group and typically occur in elevated levels in the blood following injury to brain or muscle tissue

**creatinine:** a chemical substance resulting from the metabolism of creatine, that is found in muscle tissue and blood; creatinine is normally excreted in the urine as a metabolic waste; when elevated in the blood it indicates impairment of [kidney](#) function

**cryoablation:** see [cryosurgery](#)

**cryoprobe:** a surgical instrument used to apply extreme cold to tissues during [cryosurgery](#)

**cryosurgery:** the use of liquid nitrogen probes to freeze a particular organ to extremely low temperatures to kill the tissue, including any cancerous tissue; When used to treat prostate cancer, the cryoprobes are guided by transrectal ultrasound ([TRUS](#)). See our paper [Cryoablation of the Prostate](#).

**cryotherapy:** see [cryosurgery](#)

**CT scan:** computerized or computed tomography; See [CAT Scan](#)

**curcumin:** a biologically active substance derived from the curcuma longa plant; found within the Indian spice called turmeric; curcumin and its curcuminoid [polyphenols](#) have anti-prostate cancer activity against both [AIPC](#) and [ADPC](#)

**cyproterone:** an [antiandrogen](#) with progestational activity; see [progesterone](#).

**cystitis:** inflammation of the bladder that may be caused by infection or chemical injury or radiation; characterized by increased urinary frequency, discomfort on urination and often red blood cells, white blood cells and/or bacteria in the urine

**cystoscope:** an instrument used by physicians to look inside the the [urethra](#) and the [bladder](#)

**cystoscopy:** the use of a [cystoscope](#) to look inside the [urethra](#) and the [bladder](#)

**cystosol:** the soluble components of the fluid matter enclosed within the cellular membrane



**Cytadren®**: the trademarked name for [aminogluthethimide](#)

**cytochrome C**: a [protein](#) that carries electrons released from the [mitochondria](#) to initiate cell death

**cytochrome P-450 dependent 14-demethylation**: an enzyme system that is important in the [endocrine](#) pathways of hormone production and activation

**cytokines**: any of several regulatory proteins, such as the [interleukins](#) and lymphokines, that are released by cells of the immune system and act as intercellular mediators in the generation of an immune response

**cytology**: science that deals with the structure and function of cells

**cytoplasm**: the material of a cell between the cell membrane and the nucleus

**cytoskeleton** adj. **cytoskeletal**: the internal scaffolding of cells which determines cell shape, and organizes structures within cells

**cytotoxin, cytotoxic**: chemicals that have direct [toxicity](#) to cancer cells, preventing their reproduction or growth. Cytotoxic agents can, as a side effect, damage healthy, non-cancerous tissues or organs which have a high proportion of actively dividing cells, for example, bone marrow and hair follicles

**Cytosan®**: a genotoxic drug, a [chemotherapy](#) agent that affects [DNA](#) and alters its function

## D

**D1 or D2 disease**: [metastatic](#) disease; see [Staging](#); see also [Whitmore-Jewett Staging](#)

**de novo**: in a new form or manner

**debility**: the state of being weak or feeble; infirmity

**debulking**: reduction of the volume of cancer by one of several techniques; most frequently used to imply surgical removal

**definitive local treatment**: generally that treatment which includes generally accepted procedures necessary to ultimately produce recovery of the patient. For prostate cancer this is usually considered to include [radical prostatectomy](#), [radiation therapy](#), and [cryosurgery](#).

**dendritic cells (DC)**: cells that process [antigens](#) (proteins) and present them to immune [lymphocytes](#) called [T cells](#) playing a major role in the initiation of the immune response against tumor and other types of abnormal cells; antigen presenting cells; e.g. Provenge® is an investigational therapy employing DC

**Denonvillier's fascia**: thin layer of connective tissue that separates [prostate](#) and [seminal vesicles](#) from [rectum](#)

**DES**: see [diethylstilbestrol](#)

**DEXA (dual energy X-RAY absorptiometry)**: a type of bone mineral density radiologic examination using x-ray absorption; see also [qCT](#)

**dexamethasone (DXM)**: a synthetic [glucocorticoid](#) used primarily in the treatment of inflammatory disorders. It can have both an [antiemetic](#) and an anti-prostate cancer effect.

**dextrans**: a group of glucose polymers made by certain bacteria

**DHEA (dehydroepiandrosterone)**: an [adrenal androgen](#) precursor produced in the adrenal cortex and transformed into [testosterone](#) within prostate cells

**DHEA-S**: the sulfated form of [DHEA](#); sulfation is a chemical process that alters the molecule by adding a sulfur-type group; sulfation occurs in the liver; DHEA-S is a more reliable laboratory test than DHEA

**DHT**: see [dihydrotestosterone](#)

**diabetes**: a condition in which the body either cannot produce insulin or cannot effectively use the insulin it produces

**diabetes mellitus**: a severe, chronic form of diabetes caused by insufficient production of insulin and resulting in abnormal metabolism of carbohydrates, fats, and proteins.

**diagnosis (Dx)**: the evaluation of signs, symptoms and selected test results by a physician to determine the physical and biological causes of the signs and symptoms and whether a specific disease or disorder is involved

**diethylstilbestrol (DES)**: also called stilbestrol - a synthetic hormone with estrogenic properties; a treatment of prostate cancer with activity against [AIPC](#) as well as [ADPC](#)

**differentiation**: the use of the differences between prostate cancer cells when seen under the microscope as a method to grade the severity of the disease; well differentiated cells are easily recognized as normal cells, while poorly differentiated cells are abnormal, cancerous and difficult to recognize as belonging to any particular type of cell group

**digital rectal examination (DRE)**: the use by a medical provider of a lubricated and gloved finger inserted into the rectum to feel for abnormalities of the prostate and [rectum](#)

**dihydrotestosterone (DHT or 5 alpha-**

**dihydrotestosterone)**: a male hormone more potent than [testosterone](#) that is converted from testosterone within the prostate by [5 alpha reductase](#)

**dimethyl sulfoxide (DMSO)**: a colorless solvent, used to penetrate and convey medications into the tissues

**diploid**: having one complete set of normally paired [chromosomes](#), i.e., a normal amount of DNA; diploid cancer cells tend to grow slowly and respond well to hormone therapy; a diploid number of chromosomes would equal 46, a haploid set would equal 23; see also [haploid](#)

**dissection**: the cutting apart of an organism to examine its structure

**distal:** away from a point of reference, compare to proximal

**distensibility:** The ability to enlarge or distend

**diurnal:** pertaining to the day; having a cyclic nature involving the 24-hour day; [prolactin](#) levels are at their peak in the early morning- they have a diurnal variation; calcium utilization appears highest in the evening close to bedtime

**DMSO:** [dimethyl sulfoxide](#)

**DNA (deoxyribonucleic acid):** the basic biologically active chemical that defines the physical development and growth of nearly all living organisms; a complex protein that is the carrier of genetic information

**docetaxel (Taxotere®):** one of a type of [chemotherapy](#) agents called taxanes that block microtubule formation during cell division

**Doppler:** a method in ultrasound imaging to monitor a moving structure or fluid (esp. blood)

**dose volume histogram (DVH):** A graph that displays the distribution of the absorbed radiation dose in tissue resulting from the delivery of a particular treatment plan.

**dosimetry:** Relating to the doses of radiation employed in treating a tumor

**double-blind:** a form of [clinical trial](#) in which neither the physician nor the patient knows the actual treatment which any individual patient is receiving; double-blind trials are a way of minimizing the effects of the personal opinions of patients and physicians on the results of the trial

**doubling time:** the time that it takes a value (like [PSA](#)) to double

**down-regulation:** the process of reducing or suppressing a response to a stimulus; specifically reduction in a cellular response to a molecule (as insulin) due to a decrease in the number of [receptors](#) on the cell surface

**downsizing:** the use of hormonal or other forms of management to reduce the volume of prostate cancer in and/or around the prostate prior to attempted curative treatment

**downstaging:** the use of hormonal or other forms of management in the attempt to lower the [clinical stage](#) of prostate cancer prior to attempted curative treatment (e.g., from stage T3a to stage T2b); this technique is highly controversial

**doxorubicin (trade name Adriamycin®):** an anticancer drug that belongs to the family of drugs called anti-[tumor antibiotics](#). It is an [anthracycline](#).

**Dpd:** deoxyypyridinoline (Pyrilinks-D®); a bone [resorption](#) marker reflecting breakdown of bone collagen

**DRE:** see [digital rectal examination](#)

**dry orgasm:** ejaculation without the release of [semen](#)

**ductal:** a tubular bodily canal or passage, especially one for carrying a glandular secretion: a *tear duct*.

**dutasteride (trade name Avodart®):** an inhibitor of the [enzyme \(5 alpha-reductase or 5AR\)](#) that stimulates the conversion of [testosterone](#) to [DHT](#); used to treat [BPH](#)

**Dx:** standard abbreviation for diagnosis

**dysfunction:** abnormal or impaired functioning, especially of a bodily system or organ

**dysplasia:** abnormal development or growth of tissues, organs, or cells; see also [PIN](#)

**dysuria:** painful urination

## E

**EBRT (external beam radiation therapy):** external beam radiation treatment that can include conventional [photons](#), or use protons, neutrons, or electrons. This may be given conventionally or with 3D conformal techniques; see also [IMRT](#).

**ECE:** an abbreviation for [extra-capsular extension](#)

**ECOG:** Eastern Cooperative Oncology Group; one of the clinical trials groups

**ECOG Performance Status:** criteria used by doctors and researchers to assess how a patient's disease is progressing, assess how the disease affects the daily living abilities of the patient, and determine appropriate treatment and prognosis. See also: [Karnofsky Performance Status](#)

**ED:** [erectile dysfunction](#)

**edema:** swelling or accumulation of fluid in some part of the body

**efferent:** moving or carrying outward or away from a central part. Refers to vessels, nerves, etc. For example: blood vessels carrying blood away from the heart or nerves carrying signals from the brain

**efficacy:** the greatest ability of a drug of treatment to produce a result, regardless of dosage

**EGCG (epigallocatechin gallate):** the active ingredient of green tea that relates to the potency of the green tea product

**EGF:** epidermal growth factor; a polypeptide [hormone](#) that stimulates cell proliferation by binding to receptor proteins on the cell surface

**eicosanoid:** any of a class of compounds derived from polyunsaturated fatty acids (as [arachidonic acid](#)) and involved in cellular activity

**ejaculation:** the release of semen through the [penis](#) during orgasm; ejaculation may be termed "dry" if there is scanty or no fluid component to the ejaculate resulting from [radiation therapy](#) or surgery.

**ejaculatory ducts:** The tubular passages through which semen reaches the prostatic urethra during orgasm

**EKG:** electrocardiogram; a study showing the electrical activity of the heart

**ELISA:** enzyme-linked immunosorbent assay; a sensitive immunoassay that uses an enzyme linked to an [antibody](#) or [antigen](#) as a marker for the detection of a specific protein, especially an antigen or antibody; often used as a diagnostic test to determine exposure to a particular infectious agent, such as the AIDS virus, by identifying antibodies present in a blood sample; see [immunoassay](#)

**embolus, embolic:** a mass, such as an air bubble, a detached blood clot, or a foreign body, that travels through the bloodstream and lodges so as to obstruct or occlude a blood vessel.

**EMCYT:** see [estramustine phosphate](#)

**endocrine:** pertaining to ductless glands that secrete [hormones](#) into the blood stream

**endocrinology:** the study of [hormones](#), their function, the organs that produce them and how they are produced

**endogenous:** inherent naturally to the organism; originating or produced within an organism, tissue, or cell, e.g. *endogenous secretions*.

**endorectal:** (inserted) within the [rectum](#)

**endorectal coil:** a device that is inserted into a patient's [rectum](#) beneath the prostate and is used to acquire [spectroscopy](#) for prostate [MRI/MRSI](#) exams

**endorectal MRI:** [magnetic resonance imaging](#) performed with a coil placed in the [rectum](#), may be combined with endorectal magnetic resonance spectroscopy (developed at University of California at San Francisco and Memorial Sloan Kettering in New York City) See our paper [The Role of Combined MRI & MRSI in Treating Prostate Cancer](#)

**endoscope:** an instrument for examining visually the interior of a bodily canal or hollow organ such as the colon, bladder, or stomach

**endothelin-1 (ET-1):** a prostate cell product that stimulates [osteoblasts](#), acts as a vasoconstrictor (narrows blood vessels) and may be responsible for bone pain in [metastatic](#) prostate cancer; blockers of the receptor for ET-1 are in clinical trials and showing promise e.g. Atrasentan®

**endotoxin:** a toxin produced by certain bacteria and released upon destruction of the bacterial cell

**enzyme:** any of a group of chemical substances which are produced by living cells and which cause particular chemical reactions to happen while not being changed themselves

**EOD (extent of disease):** part of what should be a standard approach to staging the bone scan; after work by Soloway

**EPA (eicosapentenoic acid):** a fish oil supplement, an omega 3 fatty acid that inhibits the delta 5 desaturase [enzyme](#) that converts DGLA (dihomo-gamma-linolenic acid) to [arachidonic acid](#)

**epidemiology:** the branch of medicine that deals with the study of the causes, distribution, and control of disease in populations

**epididymis:** tightly coiled, thin-walled tube that conducts sperm from the [testes](#) to the [vas deferens](#) and provides for the storage, transmission, and maturation of sperm; inflammation of the epididymis is called epididymitis

**epidural:** outside the outer membrane surrounding the brain or spinal column

**epinephrine:** a hormone and neurotransmitter (Also called adrenaline); one of the secretions of the [adrenal glands](#). It helps the liver release glucose (sugar) and limit the release of [insulin](#); it also makes the heart beat faster and can raise blood pressure

**epithelial cell:** in PC the cells within the prostate that line the ducts and functionally secrete chemicals such as PSA into the blood stream or into the duct openings or [lumen](#)

**epithelium, epithelial:** the covering of internal and external surfaces of the body, including the lining of vessels and other small cavities. It consists of cells joined by small amounts of cementing substances. Epithelium is classified into types on the basis of the number of layers deep and the shape of the [superficial](#) cells.

**epothilones:** a new class of natural and potent agents that stabilize [microtubules](#) to inhibit the growth and spread of [malignant](#) cells

**ER (estrogen receptor):** the docking site on the cell or in the cell for [estrogen](#)

**erectile dysfunction (ED):** an inability to get or maintain an erection; see [impotence](#).

**erythropoietin:** a [glycoprotein](#) hormone that stimulates the production of red blood cells by stem cells in [bone marrow](#)

**ester:** any of a class of organic compounds corresponding to the inorganic salts and formed from an organic acid and an alcohol, usually with the elimination of water

**estradiol:** the most potent naturally occurring [estrogen](#). In men it is naturally produced in small amounts.

**estramustine:** A nitrogen mustard linked to [estradiol](#), usually as phosphate (see [EMCYT](#)); used to treat prostatic [neoplasms](#); also has radiation protective properties.

**estramustine phosphate sodium (EMCYT):** a [chemotherapeutic](#) agent; a hybrid drug combination of nitrogen mustard and [estrogen](#) that disrupts [cytoplasmic microtubules](#)

**estrogen:** a female hormone or estrogen (e.g., [diethylstilbestrol](#)) used in the treatment of PC

**estrogen receptor (ER):** the docking site on the cell or in the cell for [estrogen](#)

**etidronate:** a white disodium [bisphosphonate](#) salt C<sub>2</sub>H<sub>6</sub>Na<sub>2</sub>O<sub>7</sub>P<sub>2</sub> used to treat [osteoporosis](#) called also *etidronate disodium*

**etiology:** the study of all of the factors involved in the development of a disease

**etoposide:** a genotoxic drug, a [chemotherapy](#) agent that affects [DNA](#) and alters its function

**eukaryotic:** a single-celled or multicellular organism whose cells contain a distinct membrane-bound [nucleus](#)

**Eulexin®:** the brand or trade name of [flutamide](#) in the USA

**exogenous:** developed or originating outside the [organism](#), as exogenous disease

**experimental:** an unproven (or even untested) technique or procedure; note that certain experimental treatments are commonly used in the management of prostate cancer

**expression:** the process by which a [gene's](#) coded information is converted into the structures present and operating in the cell. Expressed genes include those that are transcribed into [mRNA](#) and then translated into protein and those that are transcribed into RNA but not translated into [protein](#).

**external beam radiation therapy (EBRT):** a form of radiation therapy in which the radiation is delivered by a machine directed at the area to be radiated as opposed to radiation given within the target tissue such as [brachytherapy](#), see also [IMRT](#)

**extra-capsular extension (ECE):** cancer extending beyond the prostate [capsule](#)

**extracellular:** outside a cell or cells

**extraprostatic:** located outside the prostate

**ex vivo:** outside the living organism

## F

**false negative:** an erroneous negative test result; for example, an imaging test that fails to show the presence of a cancer tumor later found by biopsy to be present in the patient is said to have returned a false negative result

**false positive:** a positive test result mistakenly identifying a state or condition that does not in fact exist

**fast echo spin (FSE):** in [MRI](#), echo sequence is characterized by a series of rapidly applied 180° rephasing pulses and multiple echoes

**FDA:** United States Food and Drug Administration

**ferritin:** an iron-containing protein complex, found principally in the intestinal [mucosa](#), spleen and liver that functions as the primary form of iron storage in the body

**Feulgen stain:** a [histology](#) stain used in microscopy to identify [chromosomal](#) material or [DNA](#)

**FGF:** fibroblast growth factor (contributes to blood vessel development)

**fibril:** a small thread-like structure that is often part of a cell

**fibroblast, fibroblastic:** a connective-tissue cell that secretes [proteins](#) and especially molecular [collagen](#) from which the [extracellular](#) matrix of connective tissue forms

**fiducial:** used as a fixed standard of reference for comparison or measurement

**finasteride (Proscar®):** an inhibitor of the [enzyme \(5 alpha-reductase or 5AR\)](#) that stimulates the conversion of [testosterone](#) to [DHT](#); used to treat [BPH](#)

**fistula:** an abnormal passage between two organs

**flare reaction:** the transient increase in serum testosterone for the first few weeks after starting an [LHRH agonist](#). This increase in testosterone can potentially worsen the signs and symptoms of disease, especially in those patients with vertebral [metastases](#) and/or [urinary](#) obstruction; may be prevented by taking an [antiandrogen](#) (Casodex® or Eulexin®) several days before starting an LHRH agonist or by the use of an LHRH [antagonist](#) such as abarelix (Plenaxis®). See our paper [Clinical Flare: A Crisis That Can Be Avoided](#).

**flow cytometry:** a measurement method that determines the fraction of cells that are [diploid](#), [tetraploid](#), [aneuploid](#), etc

**fluence:** Particles per unit time; similar to current only the particles are photons

**fluoroscope:** a device consisting of a fluorescent screen, used in conjunction with an [X-ray](#) tube, that shows the images of objects between the tube and the screen

**fluorouracil:** an [antineoplastic chemotherapy](#) agent that inhibits certain [DNA](#) building blocks, used especially in the treatment of cancers of the skin, breast, and digestive system

**flutamide (Eulexin®):** an [antiandrogen](#) used in the [palliative hormonal treatment](#) of advanced prostate cancer and in the [adjuvant](#) and [neoadjuvant](#) hormonal treatment of earlier stages of prostate cancer; normal dosage is 2 capsules three times a day

**focal therapy:** a more localized treatment directed at the cancerous foci within the gland, rather than removing or destroying the entire prostate

**focus:** pl. foci: Group of (frequently [neoplastic](#)) cells, identifiable by distinctive distribution or structure.

**Foley:** a transurethral (Foley) catheter

**follicle stimulating hormone (FSH):** in the male, stimulates the Sertoli cells of the [testicle](#) to make sperm

**fossa:** a cavity, or depression; as the location from which the prostate was removed

**fraction:** The portion of a fractionated [radiation treatment](#) that is delivered in a single session

**free PSA:** [PSA](#) molecules in the blood stream that are not "bound" to other proteins

**free PSA %:** reports the percentage of free-PSA and usually expressed as a percentage based on free PSA divided by total [PSA](#) x 100; one study showed that men with free PSA %

> 25% had low risk of PC while those with < 10% free PSA % were more likely to have PC.

**free radical:** An atom or group of atoms that has at least one unpaired electron and is therefore unstable and highly reactive. In animal tissues, free radicals can damage cells and are believed to accelerate the progression of cancer, cardiovascular disease, and age-related diseases

**frequency:** (as relates to the prostate) the need to urinate often

**frozen section:** a technique in which removed tissue is frozen, cut into thin slices, and stained for microscopic examination; a [pathologist](#) can rapidly complete a frozen section analysis, and for this reason, it is commonly used during surgery to quickly provide the surgeon with vital information such as a preliminary pathologic opinion of the presence or absence of prostate cancer (usually in the [pelvic lymph nodes](#))

**FSH:** See [follicle stimulating hormone](#)

**fusion:** combining two or more inputs of data so that they can be overlaid one upon another to provide a sense of agreement or [concordance](#); fusion imaging studies such as ProstaScint-CT-PET are examples

## G

**G-CSF:** [granulocyte](#) colony-stimulating factor

**G<sub>0</sub>G<sub>1</sub> growth phase:** with G<sub>0</sub> being the relatively dormant phase of the cell growth cycle and G<sub>1</sub> the phase just preceding [DNA](#) synthesis or S-phase

**G1 arrest:** arrest or halting the cell cycle at the stage of G<sub>1</sub>; the normal sequence is G<sub>1</sub>-S-G<sub>2</sub>-M

**gantry:** [Radiation therapy](#) hardware from which the linear accelerator delivers its energy; the multileaf collimator [MLC](#) is attached to the gantry and modulates the radiation beam as it exits

**gastrin:** [hormone](#) released after eating, which causes the stomach to produce more acid

**gastrointestinal (GI):** related to the digestive system and/or the intestines

**gefitinib (Iressa®):** a drug that blocks cancer cell growth signals caused by an [enzyme](#) called [tyrosine kinase](#). Iressa® blocks several of these tyrosine kinases, including one associated with [Epidermal Growth Factor Receptor](#) (EGF)

**gene, adj. genetic:** the unit of [DNA](#) that carries physical characteristics from parent to child

**genital system:** the biological system that, in males, includes the [testicles](#), the [vas deferens](#), the prostate and the [penis](#)

**genitourinary system (GU system):** In the male, pertaining to the organs comprising the genital and urinary system. This includes the [testicles](#), [penis](#), [seminal vesicles](#), [urethra](#), [bladder](#), [ureters](#) and [kidneys](#)

**genome:** the total genetic content contained in a [haploid](#) set of [chromosomes](#) in single or multi-celled organisms, in a single chromosome in bacteria, or in the [DNA](#) or [RNA](#) of viruses; an organism's genetic material

**genomic instability:** the instability of genetic material as a result of destructive chemical processes that lead to mutation

**GH (growth hormone):** a [pituitary hormone](#) shown to stimulate [amino](#) acid uptake into tissues, promote [DNA](#) and [RNA](#) and protein synthesis, have a role in cell division and [hypertrophy](#) and increase bone growth and lean body mass

**gland:** a structure or organ that produces a substance which is used in another part of the body

**gland volume (GV):** the size in cubic centimeters or grams of the prostate gland

**glans penis:** cap-shaped expansion at the end of the [penis](#), having the [urethral](#) opening at the center.

**Gleason:** name of physician who developed the Gleason grading system commonly used to grade prostate cancer

**Gleason grade:** a widely used method for classifying prostate cancer tissue for the degree of loss of the normal glandular architecture (size, shape and [differentiation](#) of glands); a grade from 1–5 is assigned successively to each the two most predominant tissue patterns present in the examined tissue sample and are added together to produce the [Gleason score](#); high numbers indicate poor differentiation and therefore more aggressive cancer.

**Gleason score:** two [Gleason Grade](#) numbers are added together to produce the Gleason Score. The first Gleason Grade number indicates the Gleason Grade of the cancer cells found most commonly within the sample, the second number the second most commonly found grade. For example, a Gleason Score of 4+3=7 means that Gleason Grade 4 is the most commonly found type of cell, Gleason Grade 3 the second most commonly found, producing a total Gleason Score of 7. [Related Paper](#)

**glia:** supportive tissue of the brain. There are three types of glial tissue: astrocytes, oligodendrocytes and microglia. Glial cells do not conduct electrical impulses, as do neurons.

**glucocorticoid:** any of a group of anti-inflammatory [steroid](#) like compounds, such as [hydrocortisone](#), that are produced by the [adrenal cortex](#), are involved in carbohydrate, protein, and fat metabolism, and are used as anti-inflammatory agents

**glucose:** an optically active sugar; the usual form in which carbohydrate is assimilated by animals

**glutathione:** a compound of the [amino](#) acids glycine, cystine, and glutamic acid occurring widely in plant and animal tissues and forming reduced and oxidized forms important in biological oxidation-reduction reactions

**glutathione S-transferase:** a [protein](#) which plays an important role in inactivating chemicals that are able to cause [gene](#) damage and promote genetic instability. A recent study has shown that this protein is deactivated very early in the development of prostate cancer.

**glycemia, glyceemic:** the concentration of [glucose](#) in the blood. It is usually expressed in milligrams per deciliter (mg/dl).

**glycolysis:** a set of ten chemical reactions that is the first stage in the metabolism of [glucose](#)

**glycoprotein:** any of a group of conjugated [proteins](#) that contain a carbohydrate as the nonprotein component

**GM-CSF:** [granulocyte-macrophage](#) colony-stimulating factor

**GNRH:** gonadotropin-releasing hormone, see [LHRH](#)

**goserelin acetate (Zoladex®):** a luteinizing hormone releasing hormone ([LHRH](#)) analog used in the hormonal treatment of advanced prostate cancer and in the [adjuvant](#) and [neoadjuvant hormonal treatment](#) of earlier stages of prostate cancer

**GP:** general practice physician

**grade:** a means of describing the potential degree of severity of a cancer; see [Gleason Grade](#)

**granulocyte:** any of a group of white blood cells having granules in the [cytoplasm](#)

**gray (Gy):** The SI (Système International) unit of absorbed radiation dose:

1 Gy = 1 joule/kg = 100 rads  
1/100 Gy = 1 **centigray (cGy)**

**GTP:** green tea polyphenols, the active substances within green tea

**gynecomastia:** enlargement or tenderness of the male breasts or nipples; a possible side effect of [hormonal therapy](#) which leads to increased levels of [estrogens](#) as seen with DES, [antiandrogen monotherapy](#) (Flutamide® or Casodex®) or the combination of the latter with Proscar®

## H

**H-2 blockers:** blockers of histamine, a substance responsible for gastric acidity among other functions

**half life:** the time it takes for half of the nuclei of a radioactive substance to decay or the amount of time required to reduce a drug level to one half of the initial value

**haploid:** having the same number of sets of chromosomes as a germ cell (sperm or egg) or half as many as a somatic cell (all remaining cells having to do with the body); having a single set of chromosomes; see [diploid](#)

**HC:** [hydrocortisone](#)

**HDK:** high dose ketoconazole; [Nizoral®](#)

**HDL cholesterol:** high density lipoprotein [cholesterol](#); a beneficial cholesterol composed of a high proportion of protein (with little triglyceride and cholesterol) and that is associated with decreased probability of developing [atherosclerosis](#)

**HDR (high dose radiation):** radiation delivered by temporary insertion of radioactive Iridium wire into flexible needles placed in the prostate through the [perineum](#). See our paper [Temporary Seed Implant with High Dose Rate Brachytherapy](#).

**hematocrit (HCT):** a measure of the number of red cells found in the blood, stated as a percentage of the total blood volume

**hematology:** a medical science that deals with the blood and blood-forming organs

**hematopoietic:** pertaining to tissues such as the bone marrow, spleen and [lymph nodes](#) where blood cell formation and destruction occur

**hematospermia:** the occurrence of blood in the [semen](#)

**hematuria:** the occurrence of blood in the urine

**hemiprostate:** the left or right side of the prostate

**hemoglobin (HGB):** a complex protein-iron compound in the blood that carries oxygen from the lungs to the cells and carries carbon dioxide back to the lungs. Each red blood cell contains several hundred molecules of hemoglobin.

**hemorrhage:** to undergo heavy or uncontrollable bleeding

**hemostatic:** an agent that shortens the clotting time of blood

**Herceptin®:** the trade name for [trastuzumab](#)

**hereditary:** inherited from one's parents and earlier generations

**heredity:** the historical distribution of biological characteristics through a group of related individuals via their [DNA](#)

**heterogeneous (heterogeneity):** non-uniform; composed of mixtures of different kinds; in reference to tumors meaning composed of different clones of cells

**high dose ketoconazole (HDK):** see [Nizoral®](#); Also see our paper [High Dose Ketoconazole Plus Hydrocortisone](#).

**high-intensity focused ultrasound (HIFU):** a procedure which utilizes [transrectal ultrasound](#) that is highly focused into a small area, creating intense heat which is lethal to prostate cancer tissue. See our paper: [Transrectal HIFU: The Next Generation?](#)

**hilum:** a shallow depression in one side of a [lymph node](#) through which blood vessels pass and [efferent](#) lymphatic vessels emerge

**histology:** the study of the appearance and behavior of tissue, usually carried out under a microscope by a [pathologist](#) (who is a physician) or a histologist (who is not necessarily a physician)

**histomorphometry:** the quantitative measurement and characterization of the microscopic organization and structure of a tissue especially by computer-assisted analysis of images

**histone:** any of various simple water-soluble [proteins](#) that are rich in the basic [amino](#) acids lysine and arginine and are complexed with DNA in the [nucleosomes](#) of [eukaryotic chromatin](#)

**histopathologic:** tissue changes that affect a part or accompany a disease

**HMO:** health maintenance organization; an insurance plan in which you choose a primary care physician who must approve referrals to other providers

**HMW-uPA:** high molecular weight [uPA](#)

**homeopathy:** a system of healing that normally involves remedies being administered in reduced doses.

**homeostasis:** the ability or tendency of an organism or cell to maintain internal equilibrium by adjusting its physiological processes

**homogeneous (homogeneity):** uniform; composed of the same element; in reference to a tumor cell population meaning that the cells are of the same clone in contrast to a mixed cell population that would exhibit heterogeneity or be [heterogeneous](#)

**homologous:** corresponding, as in relative position or structure; a homologous [tumor](#) is made up of cells resembling those of the tissue in which it is growing

**hormone:** biologically active chemicals that are responsible for the development of secondary sexual characteristics and other biologic activities

**hormone ablation therapy:** see [hormone therapy](#).

**hormone blockade therapy:** see [hormone therapy](#).

**hormone-naïve:** not having received prior hormone therapy

**hormone refractory PC (HRPC) (see [AIPC](#)):** a loosely used term that really should apply to progressive PC in the setting of a [testosterone](#) level less than 20 ng/dl and when an [ARM](#) has been excluded; the preferred term is AIPC or androgen independent PC. See our paper [Hormone-Refractory Prostate Cancer: A Continuum of Diseases and Options](#)

**hormone therapy (HT):** the use of [hormones](#), hormone analogs, and certain surgical techniques to treat disease (in this case prostate cancer) either on their own or in combination with other hormones or in combination with other methods of treatment; because prostate cancer is usually dependent on male hormones (ex: [testosterone](#)) to grow, hormone blockade or deprivation (also called [androgen deprivation therapy](#)) can be an effective means of alleviating symptoms and retarding the development of the disease

**hot flash:** the sudden sensation of warmth in the face, neck and upper body; a side effect of many forms of [hormone therapy](#)

**HRPC:** see [hormone refractory prostate cancer](#).

**HSD (hydroxysteroid dehydrogenase):** the [enzyme](#) that oxidizes or reduces [testosterone](#) to [androstenedione](#) or vice versa

**hybridization protection assay (HPA):** a process that hybridizes the [amplicon](#) to singlestranded [nucleic acid](#) probes that are labeled with an Acridinium Ester (AE) molecule and then it selects and detects the hybridized probes.

**hydrocortisone (HC):** a steroid compound synthesized in the [adrenal cortex](#) and vital to survival

**hydrolyze:** undergo hydrolysis; decompose by reacting with water

**hydronephrosis:** abnormal enlargement of a [kidney](#), may occur secondary to acute [ureteral](#) obstruction or chronic kidney disease.

**hydroxyapatite:** a crystal structure that is a building block for bone; principal bone salt,  $\text{Ca}_5(\text{PO}_4)_3\text{OH}$ , which provides the compressional strength of vertebrate bone

**hydroxyflutamide:** the active [metabolite](#) of [flutamide](#)

**hypercalcemia:** abnormally high concentrations of calcium in the blood, indicating leeching of calcium from bone (tumors raise serum calcium levels by destroying bone or by releasing PTH or a PTH-like substance, [osteoclast](#)-activating factor, [prostaglandins](#), and perhaps, a vitamin D-like sterol). Symptoms of hypercalcemia may include: feeling tired, difficulty thinking clearly, lack of appetite, abdominal pain, frequent urination, increased thirst, constipation, nausea, and vomiting.

**hyperechoic:** denoting a region in an ultrasound image in which the echoes are stronger than normal or than surrounding structures; the opposite of [hypoechoic](#)

**hyperintensity:** a term used to describe light areas of a scan image due to a increased enhancement of that region

**hyperlipidemia, hyperlipemia:** an excess of fats (or lipids) in the blood

**hyperplasia:** enlargement of an organ or tissue because of an increase in the number of cells in that organ or tissue; see also [BPH](#)

**hypersensitive PSA (ultrasensitive PSA):** a laboratory assay for PSA that is more sensitive to detection of low levels of PSA than a standard assay; these assays allow for earlier detection of [recurrence](#) and can distinguish an excellent response to [ADT](#) from a mediocre response; DPC Immulite® 3rd generation and Tosoh are two examples of hypersensitive PSA assays available

**hypertension:** arterial disease in which chronic high blood pressure is the primary symptom

**hyperthermia:** treatment that uses heat; for example heat produced by microwave radiation

**hypertrophy:** the enlargement or overgrowth of an organ or part due to an increase in size of its constituent cells; compare to [hyperplasia](#); see [benign prostatic hyperplasia](#) (BPH)

**hypocalcemia:** low blood calcium; symptoms may include irritability, muscle spasms or contractions of hands, feet or legs

**hypoechoic:** A region in an ultrasound image in which the echoes are weaker or fewer than normal or in the surrounding regions; the opposite of [hyperechoic](#)

**hypofractionated:** a radiation treatment that is divided into fewer individual sessions (but correspondingly higher doses of radiation) than usual

**hypoglycemia:** less than normal level of sugar in the blood

**hypointensity:** a term used to describe dark areas of a scan image due to a decreased enhancement of that region

**hypotension:** arterial disease in which chronic low blood pressure is the primary symptom

**hypothalamus, (adj.) hypothalamic:** a portion of the brain which secretes substances that control metabolism by exerting an influence on [pituitary](#) gland function.

**hypoxia, hypoxic:** a deficiency of oxygen reaching the tissues of the body

## I

**IAD (intermittent androgen deprivation):** [ADT](#) that discontinues [testosterone](#) lowering therapy with the intent to allow the patient to recover from symptoms of [ADS](#) as testosterone levels recover to normal; same as IHT or IAS. See our paper [Intermittent Androgen Deprivation](#)

**IAS:** intermittent androgen suppression; same as [IAD](#), IHT

**ICTP:** carboxy-terminal telopeptide of type 1 collagen (a bone [resorption](#) marker like [Dpd](#))

**IGF-1:** Insulin growth factor 1

**IGFBP:** Insulin growth factor binding protein; e.g. IGFBP3

**IHT:** intermittent hormone therapy; see [IAD](#)

**IL-1(interleukin-1):** a cell product involved in the immune response ([cytokine](#)) which facilitates [osteoblast](#) growth among its many functions; see issue 2 of Insights for a more detailed description with illustrations

**IL-1R:** Interleukin 1 receptor

**IL-6 (interleukin-6):** a [cytokine](#) that stimulates [osteoclast](#) precursors and mature osteoclasts among its many functions; see issue 2 of Insights for a more detailed description with illustrations

**imaging:** a [radiology](#) technique or method allowing a physician to see a graphic representation of something that would not normally be visible

**immortalization:** the ability of a genetically engineered cell line to reproduce indefinitely

**Immulite®:** laboratory console manufactured by Diagnostics Products Company (DPC) that evaluates [biomarkers](#) such as ultrasensitive [PSA](#)

**immune reaction:** a bodily defense reaction that recognizes an invading substance (an [antigen](#): such as a [virus](#) or fungus

or bacteria or transplanted organ) and produces [antibodies](#) specific against that antigen

**immune system:** the biological system which protects a person or animal from the effects of foreign materials such as bacteria, viruses, cancer cells, and other things which might make that person or animal sick

**immunoassay:** a laboratory technique that makes use of the binding between an [antigen](#) and its [homologous antibody](#) in order to identify and quantify the specific antigen or antibody in a sample

**immunoblot:** a [blot](#) in which a [radiolabeled antibody](#) is used as the molecular probe

**immunogenic:** capable of inducing a strong immune response

**immunohistochemistry:** of or relating to the application of tissue chemistry and immune reaction methods to analysis of living cells and tissues

**immunoperoxidase:** stains which are used in the microscopic examination of tissues. These stains are based on [antibodies](#) which will bind to specific [antigens](#), usually of [protein](#) or [glycoprotein](#) origin

**immunopositive:** a positive result is observed on [immunostaining](#) for the target substance

**immunoreaction, immunoreactivity:** See [immune reaction](#).

**immunostaining:** the staining of a specific substance by using an [antibody](#) against it which is complexed (formed into a complex) with a staining medium

**immunotherapy:** treatment of disease by inducing, enhancing, or suppressing an [immune system](#) response.

**implant:** a device that is inserted into the body; e.g., a tiny container of radioactive material inserted in or near a tumor (see [brachytherapy](#)); also a device inserted in order to replace or substitute for an ability which has been lost; for example, a penile implant is a device which can be surgically inserted into the penis to provide rigidity for intercourse

**impotence:** the inability to have or to maintain an erection satisfactory for intercourse; also known as ED or *erectile dysfunction*

**IMRT (intensity modulated radiation therapy):** an approach to [radiation therapy](#) allowing the treatment team to specify the tumor target dose and the amount of radiation allowable to the nearby tissues and uses sophisticated computer planning to arrive at acceptable equations; sophisticated hardware is also incorporated into this planning that allows the radiation intensity to be modulated up or down as the delivery system rotates around the patient - see our paper [Targeting For Cure: Intensity Modulated Radiation Therapy](#)

**incidental:** insignificant or irrelevant; for example, incidental prostate cancer (also known as latent prostate cancer) is a form of prostate cancer which is of no clinical significance to the patient in whom it is discovered



**incontinence:** (urinary incontinence) loss of [urinary](#) control; there are various kinds and degrees of incontinence; overflow incontinence is a condition in which the [bladder](#) retains urine after voiding; as a consequence, the bladder remains full most of the time, resulting in involuntary seepage of urine from the bladder; stress incontinence is the involuntary discharge of urine when there is increased pressure upon the bladder, as in coughing or straining to lift heavy objects; total incontinence is the inability to voluntarily exercise control over the [sphincters](#) of the bladder neck and [urethra](#), resulting in total loss of retentive ability – see our paper [Incontinence Treatment Options for Post-Prostatectomy](#)

**indication:** a reason for doing something or taking some action; also used to mean the approved clinical application of a pharmaceutical

**indolent:** minimal disease, defined as < 0.5 cc of cancer confined to the prostate with no [Gleason grade](#) 4 or 5

**induration:** an increase in the fibrous elements in tissue, a hardened mass or formation, which if felt during a [DRE](#) is worrisome

**infiltrate (adj. infiltrative):** to penetrate through a porous tissue

**inflammation:** any form of swelling or pain or irritation

**informed consent:** permission to proceed given by a patient after being fully informed of the purposes and potential consequences of a medical procedure

**in situ:** in the natural or usual place

**Insights:** the newsletter of the Prostate Cancer Research Institute ([PCRI Insights](#))

**insulin:** [hormone](#) that helps the body use glucose (sugar) for energy

**insulin growth factor1 (IGF-1):** a growth factor that stimulates PC cell growth and [osteoblast](#) growth

**intensity map:** representations of energy deposited per unit volume across a treatment volume when the deposition of energy is not delivered in a homogeneous manner

**interferon:** a body protein that affects [antibody](#) production and can modulate (regulate) the [immune system](#)

**interleukin (IL):** any of various compounds of low molecular weight that are produced by [T-cells](#) and [macrophages](#) and that function especially in regulation of the [immune system](#) and cell-mediated immunity

**interstitial:** within a particular organ; for example, interstitial prostate radiation therapy is radiation therapy applied within the prostate using implanted radioactive pellets or seeds (see also [brachytherapy](#))

**intracrinology:** the part of [endocrinology](#) that focuses on the fact that, in men and women, an important proportion of androgens and estrogens are synthesized locally at their site of action in peripheral target tissues

**intraductal:** within a duct

**intraepithelial:** within the layer of cells that forms the surface or lining of an organ

**intraglandular prostate cancer:** See [organ confined disease](#) (OCD).

**intraoperative:** occurring, carried out, or encountered in the course of surgery

**intravascular:** within a vessel or vessels

**intravenous (IV):** into a vein

**invasive:** requiring an incision or the insertion of an instrument or substance into the body

**inverse planning:** Treatment planning for [radiation therapy](#) in which various aspects of the treatment plan are generated by a computer in order to achieve the dose distribution prescribed by a physician

**investigational:** a drug or procedure allowed by the [FDA](#) for use in [clinical trials](#)

**in vitro:** in an artificial environment e.g. within a Petri dish or test-tube

**in vivo:** within a living organism

**involution:** a normal process marked by decreasing size of an organ

**ion:** atom or molecule that has acquired an electric charge by the loss or gain of one or more electrons

**ionize:** to dissociate atoms or molecules into electrically charged atoms or radicals

**Iressa®:** the trade name for [gefitinib](#)

**isocenter:** The center of rotation of a treatment arc/p>

**isodose contour:** A two or three-dimensional shape that contains the volume receiving a dose greater than or equal to a specified amount

**isodose line:** A two-dimensional line that circumscribes an area receiving a dose greater than or equal to a specified amount

**isoform:** One of a set of similar [proteins](#) that have the same function but slightly different composition, e.g. free and complexed [PSA](#)

**isotherm:** a line on a chart representing the locations of zones having a particular temperature

**isotope:** a different form of a chemical element having similar properties

**iterations:** Repeated series of steps, performed either by the computer or by the user, implemented to develop a treatment plan

**IVP (intravenous pyelogram):** a procedure that introduces an [X-ray](#) absorbing dye into the [urinary](#) tract in order to allow the physician a superior image of the tract by taking an x-ray;

## K

**Kaplan-Meier method:** a statistical method that produces a graph showing the percent of a patient population surviving at various intervals of time after the start of the study or treatment

**Karnofsky Performance Status:** index that allows cancer patients to be classified using a standard way of measuring the ability to perform ordinary tasks. See also: [ECOG Performance Status](#)

**Kegel exercises:** a set of exercises designed to improve the strength of the muscles used in urinating

**keratin:** any of various sulfur containing fibrous [proteins](#) that form the chemical basis of horny epidermal tissues (as hair and nails) and are typically not digested by [enzymes](#) of the [gastrointestinal](#) tract

**ketoconazole:** see [Nizoral®](#)

**kidney:** one of a pair of organs whose primary function is to filter the fluids passing through the body

**killer cells:** white blood cells that attack [tumor](#) cells and body cells that have been invaded by foreign substances

**kinase:** an [enzyme](#) that catalyzes the conversion of a pro-enzyme to an active enzyme

**kinetics:** the study of acceleration, motion or rate of change

## L

**laparoscopy:** a technique that allows the physician to observe internal organs directly through a piece of optical equipment inserted directly into the body through a small surgical incision

**laparotomy:** an operation in which the [abdomen](#) is opened to look for the cause of an undiagnosed illness

**latent:** 1) insignificant or irrelevant; for example, latent prostate cancer (also known as incidental prostate cancer) is a form of prostate cancer which is of no clinical significance to the patient in whom it is discovered; 2) [pathology](#). in a dormant or hidden stage

**LDL cholesterol:** low density lipoprotein [cholesterol](#); a lipoprotein of blood plasma that is composed of a moderate proportion of protein with little triglyceride and a high proportion of cholesterol and that is associated with increased probability of developing [atherosclerosis](#)

**lesions:** a localized [pathological](#) change in a bodily organ or tissue

**leuprolide acetate:** a [LHRH analog](#); one trade name is Lupron®

**levator:** a muscle that raises a structure in the body such as the muscles that support the [pelvic organs](#)

**Leydig cells:** cell population within the [testicles](#) that produces [testosterone](#); the other main cell population are the Sertoli cells that make sperm

**LH:** luteinizing hormone; a [pituitary hormone](#) that stimulates the [Leydig cells](#) of the [testicles](#) to make the male hormone [testosterone](#)

**LHRH:** luteinizing hormone-releasing hormone (also known as GnRH or gonadotrophin releasing hormone; [hormone](#) from the [hypothalamus](#) that interacts with the LHRH receptor in the [pituitary](#) to release [LH](#)) see [luteinizing hormone releasing hormone](#)

**LHRH analogs (or agonists):** Synthetic compounds that are chemically similar to Luteinizing Hormone Releasing Hormone ([LHRH](#)), but are sufficiently different that they suppress testicular production of [testosterone](#) by binding to the LHRH receptor in the pituitary gland and either have no biological activity and therefore competitively inhibit the action of LHRH, or has LHRH activity that exhausts the production of [LH](#) by the pituitary; used in the hormonal treatment of advanced prostate cancer and in the [adjuvant](#) and [neoadjuvant](#) hormonal treatment of earlier stages of prostate cancer; LHRH agonist (mimics natural LHRH but then shuts down LH production after continuous exposure)

**LHRH antagonist:** an agent that blocks the [LHRH](#) receptor by pure antagonism without the initial release of [LH](#) seen with [LHRH agonists](#); abarelix (Plenaxis®) is an example

**libido:** interest in sexual activity; the psychic and emotional energy associated with instinctual biological drives

**ligand:** An ion, a molecule, a molecular group, a substance or messenger that binds to another chemical entity at a [receptor](#) to form a larger complex which is then activated

**linear accelerator:** A type of high energy [X-ray](#) machine that generates radiation fields for [external beam radiation therapy](#). A linear accelerator is typically mounted with a [collimator](#) and/or a [multileaf collimator](#) in a [gantry](#) that revolves vertically around a treatment couch

**lipid:** fat stored by the body; the two most commonly measured kinds of lipids are triglycerides and [cholesterol](#).

**lipomatosis:** condition characterized by abnormal localized, or [tumor](#)-like, accumulations of fat in the tissues

**LNCaP:** a line of human prostate cancer cells used in laboratory studies; this cell line is hormonally dependent; See [androgen dependent](#).

**lobe:** one of the two sides of an organ that clearly has two sides (e.g., the prostate or the brain)

**local therapy:** treatment that is directed at the prostate and closely surrounding tissue

**localized:** restricted to a well defined area

**LSESr (LIPO-sterolic extract of *Serenoa repens*):** the lipid extracted portion of [saw palmetto](#)

**lumbar:** portion of body between chest and pelvis, often referring to the lower back or spine

**lumen:** a cavity or channel into any organ or structure of the body

**Lupron®:** the USA trade or brand name of a leuprolide acetate, a [LHRH agonist](#)

**luteinizing hormone releasing hormone (LHRH):** a [hormone](#) responsible for stimulating the production of [testosterone](#) in the body by interacting with the LHRH receptor to release [LH](#) which in turn stimulates cells in the [testicles \(Leydig cells\)](#) to make testosterone; luteinizing hormone-releasing hormone is also known as GnRH or gonadotrophin-releasing hormone

**LUTS:** lower [urinary](#) tract symptoms; include symptoms of hesitancy in initiating urination, slow urination, dribbling after urination, getting up at night to urinate ([nocturia](#)) and frequency of urination; these symptoms are part of the [AUA symptom score index](#)

**LY294002:** a [lipid-modifying enzyme](#) that inhibits [PI3 kinase](#)

**lycopene:** A [carotenoid](#) responsible for the red color of the tomato, watermelon and pink grapefruit. Recent findings indicate that lycopene may be an important part of the human organism's natural defense mechanism that protects from harmful oxidizing agents

**lymph** (also lymphatic fluid): the clear fluid in which all of the cells in the body are constantly bathed; carries cells that help fight infection

**lymph nodes:** the small glands which occur throughout the body and which filter the clear fluid known as [lymph](#) or lymphatic fluid; lymph nodes filter out bacteria and other toxins, as well as cancer cells

**lymphadenectomy:** also known as a [pelvic lymph node dissection](#), this procedure involves the removal and microscopic examination of selected lymph nodes, a common site of [metastatic](#) disease with prostate cancer; this procedure can be performed during surgery prior to the removal of the prostate gland, or by means of a small incision a "[laparoscopic lymphadenectomy](#)" may be performed, a simple operation requiring only an overnight stay in the hospital

**lymphadenopathy:** disorder of the [lymph nodes](#) or vessels

**lymphatic system:** the tissue and organs that produce, store and carry cells that fight infection; includes bone marrow, spleen, [thymus](#), [lymph nodes](#), and channels that carry lymph fluid

**lymphocele:** cystic mass containing lymph from diseased lymphatic channels or following surgical trauma or other injury

**lymphocyte:** white blood cell

**lymphography:** radiologic depiction of lymphatic vessels and [lymph nodes](#) after use of a contrast material

**lytic:** of, relating to, or causing a specified kind of decomposition through rupture of cell membranes and loss of [cytoplasm](#)

## M

**M0,M1,Mx:** notation of observed metastases, see [staging](#).

**MAB (maximal androgen blockade):** see CHT, CHB, [ADT](#)

**macromolecules:** a very large molecule, such as a polymer or [protein](#), consisting of many smaller structural units linked together. Also called supermolecule

**macrophage:** a subset of white blood cells that ingest bacteria, foreign substances, proteins and process them, often presenting them to [T cells](#); one of a kind of [antigen](#) presenting cell; see [dendritic cells](#)

**MAD (maximal androgen deprivation):** see [ADT](#), CHB, CHT, TAB, MAB

**magnetic resonance:** absorption of specific frequencies of radio and microwave radiation by atoms placed in a strong magnetic field

**magnetic resonance imaging (MRI):** the use of magnetic resonance with atoms in body tissues to produce distinct cross-sectional, and even three-dimensional images of internal organs

**malignancy:** a growth or tumor composed of cancerous cells

**malignant:** cancerous; tending to become progressively worse and to result in death; having the invasive and [metastatic](#) (spreading) properties of cancer

**margin:** normally used to mean the "surgical margin", which is the outer edge of the tissue removed during surgery; if the surgical margin shows no sign of cancer ("negative margins"), then the prognosis is better

**marker:** a diagnostic indication that disease may be present or may develop

**MCF-7:** human breast cancer cell line

**mcg (micrograms):** A unit of mass equal to one thousandth ( $10^{-3}$ ) of a milligram or one millionth ( $10^{-6}$ ) of a gram

**MCP:** modified citrus pectin; a substance that is able to interfere with PC growth by preventing cell-cell interaction and adhesiveness by binding to a carbohydrate substance called galectin-3 found on the surface of tumor cells

**M-CSF:** [macrophage](#) colony-stimulating factor

**MDR gene:** the multi-drug resistance [gene](#); a gene that cells utilize to pump substances such as [chemotherapy](#) out of the cell across the cell membrane. The increase in the MDR gene is felt to be a [tumor](#) mechanism to overcome the effect of chemotherapy. [Nizoral®](#) and [tamoxifen](#) decrease MDR activity.

**medical oncologist:** a physician primarily trained in the use of medicines (rather than surgery) to treat cancer

**metabolism, adj. metabolic:** the organic processes (in a cell or organism) that are necessary for life

**metabolite:** a substance necessary for or taking part in a particular metabolic (chemical) process in the body

**metaphase:** Phase of mitosis, or cell division, when the [chromosomes](#) align along the center of the cell. Because metaphase chromosomes are highly condensed, scientists

use these chromosomes for gene mapping and identifying chromosomal aberrations.

**metastasis:** (plural **metastases**) a secondary [tumor](#) formed as a result of a cancer cell or cells from the primary tumor site (e.g., the prostate) traveling through the body to a new site and then growing there

**metastasize:** spread of a malignant [tumor](#) to other parts of the body

**metastatic:** having the characteristics of a secondary [tumor](#) formed as a result of a cancer cell or cells from the primary tumor site (e.g., the prostate) traveling through the body to a new site and then growing there

**metastatic work up:** a group of tests, including physical examination, [bone scans](#), [X-rays](#), other imaging studies and blood tests to ascertain whether cancer has [metastasized](#)

**Metastron®:** the brand or trade name of strontium-89, a radioactive isotope used in the treatment of bone pain from [metastatic](#) prostate cancer

**mg (milligram):** a unit of mass equal to one thousandth,  $10^{-3}$  of a gram

**micromets, micrometastatic cells:** microscopic cancer cells in other parts of the body that are similar to those of the original tumor

**microtubules:** tiny fibers that are basic to [DNA](#) structure that assists in the process of cell division

**microvessel density:** an objective measure of [angiogenesis](#) (blood vessel formation)

**midgland:** the section between the [apex](#) and [base](#) of the prostate

**misstaging:** the assignment of an incorrect [clinical stage](#) at initial diagnosis because of the difficulty of assessing the available information with accuracy

**mitochondria:** A spherical or elongated organ in the cytoplasm of nearly all [eukaryotic](#) cells, containing [genetic](#) material and many [enzymes](#) important for cell metabolism, including those responsible for the conversion of food to usable energy

**mitosis, mitotic:** a process of cell division in which chromosomes separate into two parts, one part of each [chromosome](#) is retained in each of two new daughter

**mitoxantrone (Novantrone®):** a drug used to treat advanced prostate cancer that does not respond to [hormones](#). It is also being studied in the treatment of other cancers. It belongs to the family of drugs called antitumor [antibiotics](#).

**MMP-2:** matrix metalloprotease-2 (PC cell product involved in [angiogenesis](#))

**modality:** a therapeutic method or agent, such as surgery, chemotherapy, or electrotherapy, that involves the physical treatment of a disorder

**molecular biology:** the branch of biology focused on the formation, structure, and function of [DNA](#), [RNA](#) and [proteins](#), and their roles in the transmission of genetic information

**monoclonal:** formed from a single group of identical cells

**monotherapy:** a treatment that uses one major drug or one major [modality](#) of treatment; [androgen deprivation therapy](#) using only an [LHRH agonist](#) is an example of monotherapy.

**morbidity:** unhealthy consequences and complications resulting from treatment

**morphology, morphologic:** a branch of biology that deals with the form and structure of animals and plants

**morphometry, morphometric:** the quantitative measurement of the form and distribution of parts, especially in living systems

**mortality:** (1) the quality of being subject to death; (2) the number of deaths in a given time or place or the proportion of deaths to population

**motility:** the ability to move spontaneously

**MRI:** see [magnetic resonance imaging](#)

**MRI/MRSI:** the integration of magnetic resonance imaging with magnetic resonance [spectroscopic](#) imaging. See our paper [The Role of Combined MRI & MRSI in Treating Prostate Cancer](#)

**mRNA:** messenger RNA; see [RNA](#).

**MRS:** magnetic resonance [spectroscopy](#)

**mucin:** the main part of mucus that protects body surfaces from rubbing or wearing down

**mucosa:** superficial lining cells involving body cavities like the mouth, rectum, bladder; a membrane lining all body passages that communicate with the air, such as the respiratory and alimentary tracts, and having cells and associated glands that secrete mucus

**multileaf collimator (MLC):** A type of [collimator](#) that can define irregularly shaped radiation fields. An MLC has two rows of narrow metal blocks (leaves) that can be independently driven in or out of the radiation beam from opposite sides under computer control

**multileaf intensity modulating collimator (MIMIC):** A multileaf collimator designed specifically for intensity modulated radiotherapy. The MIMiC treats two slices, each 1 or 2 cm thick with a fan beam of radiation, when the linear accelerator [gantry](#) rotates through an arc around the patient. The patient couch is moved to treat adjacent slices if the target is too large to treat with a single arc; see [tomotherapy](#)

**murine:** from or pertaining to mice

**mutate, mutation:** change in the genetic material ([DNA](#)) inside the cell

**myalgia:** muscle aches, pain or tenderness

## N

**N0, N1, Nx:** notation of lymph nodes metastasis, see [staging](#)

**nadir:** the lowest point

**naturopathy:** treatment of disease using natural agents and physical manipulation; avoids drugs and surgery

**nausea:** An unpleasant sensation in the abdomen often leading to vomiting.

**NCI:** National Cancer Institute

**necrosis, adj. necrotic:** death of cells or tissues through injury or disease

**negative:** the term used to describe a test result which does not show the presence of the substance or material for which the test was carried out; for example, a negative [bone scan](#) would show no sign of bone [metastases](#)

**negative predictive value:** refers to the chance that a negative test result will be correct.

**neoadjuvant:** The use of a different kind of therapy *before* the use of what is considered a more definitive therapy, e.g. the use of neoadjuvant [androgen deprivation therapy](#) (ADT) prior to radiation therapy of PC or the use of neoadjuvant [chemotherapy](#) before surgery for breast cancer. Neoadjuvant is contrasted to [adjuvant](#), which relates to the use of another therapy *after* the so-called more definitive therapy, e.g. ADT after RT

**neoadjuvant hormone blockade (NHB):** use of [ADT](#) prior to other therapies such as [radiation therapy](#), surgery or possibly [chemotherapy](#) to reduce tumor volume and/or prostate gland volume with the goal to allow these other therapies to work better; also called NHT (Neoadjuvant Hormone Therapy)

**neoplasia:** the growth of cells under conditions that would tend to prevent the development of normal tissue (e.g., a cancer)

**neoplasm, adj. neoplastic:** new and abnormal growth of tissue, which may be a benign or cancerous tumor

**nephrostomy:** establishment of an opening for a [catheter](#) from the [kidney](#) to the exterior of the body.

**nerve radicles:** small nerve roots that are seen microscopically within specific tissue, like the prostate

**nerve sparing:** term used to describe a type of [prostatectomy](#) in which the surgeon saves the nerves that affect sexual and related functions

**Neumega® (oprelvekin):** a medication which helps the body produce more [platelets](#) in the blood

**neuroendocrine:** pertaining to the relationships between the nervous and the [endocrine](#) systems

**neurogenic:** originating in the nervous system; compare to [psychogenic](#)

**neurohormone:** any of a group of substances produced by specialized cells (neurosecretory cells) structurally typical of the nervous (rather than of the [endocrine](#)) system, but that serve as a link between the two systems

**neurologic:** meaning it pertains to the nervous system, e.g., a neurologic problem

**neurons:** nerve cells which make up the central nervous system

**neuropathy, adj. neuropathic:** a disease or an abnormality of the nervous system

**neurotoxicity:** [toxicity](#) to nervous tissue (both brain and peripheral nerves)

**neurotransmitter:** a chemical that acts as messenger between cells in the brain and nervous system; it transmits impulses across the gap from a neuron to another neuron, a muscle, or a gland.

**neurovascular:** to both the [neurologic](#) and [vascular](#) systems or structures

**neurovascular bundles:** two bundles of nerves between the prostate and the rectum that control erection

**neutropenia, neutropenic:** a deficiency of [neutrophils](#). A person is considered neutropenic when their white blood cell count drops below 1000.

**neutrophil:** the principal phagocyte (microbe-eating) cell in the blood. This blood cell is the main cell that combats infections. Often, it is not present in sufficient quantities in patients with acute leukemia or after [chemotherapy](#). A severe deficiency of neutrophils increases the patient's susceptibility to infection.

**NHB, NHT:** see [neoadjuvant hormone blockade](#) (hormone therapy)

**NIH:** National Institutes of Health

**nilutamide (Nilandron®):** a non-[steroidal antiandrogen](#)

**Nizoral®:** The brand name of ketoconazole; a medication that blocks [testicular](#) and [adrenal androgen](#) production while having a direct [cytotoxic effect](#) on the PC cell; Nizoral® also is [synergistic](#) with certain [chemotherapy](#) agents and inhibits the development of the [MDR](#) gene; See our paper [High Dose Ketoconazole Plus Hydrocortisone \(HDK+ HC\)](#)

**nocturia:** the act of needing to getting up at night to [urate](#). This is usually scored as nocturia x number of times on average patient awakens to urinate. Nocturia x 3, for example, means getting up at night 3 times

**nodular:** bumpy

**nodule:** A growth or lump that may be cancerous or noncancerous.

**nomogram:** A chart representing numerical relationships

**noncoding:** In genetics, noncoding [DNA](#) describes DNA which does not contain instructions for making [proteins](#) (or other cell products such as RNAs)

**noninvasive:** not requiring any incision or the insertion of an instrument or substance into the body

**NSE:** neuron-specific enolase; a [neuroendocrine](#) marker (see [CGA](#))

**N-telopeptides (Ntx):** a bone [resorption](#) marker

**nuclear medicine:** branch of medicine dealing with the use of radioactive materials in the diagnosis and treatment of disease

**nucleated:** formed into a [nucleus](#)

**nucleic acid:** a chemical compound involved in making and storing energy and carrying hereditary characteristics, such as [DNA](#)

**nucleolus:** pl. **nucleoli:** any of the small, dense cell structures made up mostly of RNA ([ribonucleic acid](#))

**nucleosomes:** the repeating structural units of [chromatin](#), each consisting of approximately 200 base pairs of [DNA](#) around a [protein](#) core composed of the [histones](#)

**nucleus:** the main controlling body of a living cell

## O

**oblique:** a plane or section not perpendicular to the xyz coordinate system, such as long and short axis views of the heart

**occult:** detectable only by microscopic examination or chemical analysis, as a minute blood sample

**octreotide (Sandostatin®):** a synthetic protein that is similar to the naturally-occurring [hormone](#) called somatostatin. Octreotide decreases the production of many substances in the body such as [insulin](#) and glucagon (involved in regulating blood sugar), growth hormone, and chemicals that affect digestion.

**ODC:** ornithine decarboxylase; a rate-limiting [enzyme](#) in the pathway of mammalian [polyamine](#) biosynthesis. Polyamines affect [DNA](#), [RNA](#) and [protein](#) synthesis. For these reasons, ODC activity is said to be closely associated with [tumor](#) promotion. Green tea [polyphenols](#) inhibit ODC resulting in a decrease in polyamine synthesis and cell growth.

**oncogene:** a gene having the potential to cause (or facilitate) a normal cell to become cancerous

**oncologist:** a physician who specializes in the treatment of various types of cancer

**oncology:** the branch of medical science dealing with tumors; an oncologist is a specialist in the study of cancerous tumors

**oncolytic virus:** a virus that causes death of a [tumor](#) cell; after the Greek word *onkos* for tumor or mass

**opioid:** originally, a term denoting synthetic narcotics resembling opiates, but increasingly used to refer to both opiates and synthetic narcotics

**orchietomy (orchidectomy):** the surgical removal of the [testicles](#); surgical [castration](#)

**organ:** a group of tissues that work in concert to carry out a specific set of functions (e.g., the heart or the lungs or the prostate)

**organ confined disease (OCD):** PC that is apparently confined to the prostate [clinically](#) or [pathologically](#); not going beyond the confines of the prostatic capsule

**organism:** any individual living animal or plant

**orgasm:** the highest point of sexual excitement, characterized by strong feelings of pleasure and marked normally by ejaculation of [semen](#) by the male and by vaginal contractions in the female; also called climax

**orphan drug:** a category created by US [FDA](#) for medications used to treat diseases that occur rarely (less than 200,000 cases) or that there is no hope for recovery of development costs, so there is little financial incentive for industry to develop them; orphan drug status gives the manufacturer financial incentives to provide the drug

**orthotopic:** in the normal or usual position

**osseous:** consisting of or resembling bone

**osteoblast:** cell that forms bone

**osteoclast:** cell that breaks down bone; osteoclasts are in bone tissue and resorb bone leading to bone loss or [osteopenia](#) or [osteoporosis](#)

**osteoid:** uncalcified bone matrix, the product of [osteoblasts](#). Consists mainly of [collagen](#)

**osteolysis:** destruction of bone

**osteonecrosis:** condition resulting in death of bone tissue

**osteopenia:** a reduction in the bone density that is more than one standard deviation from the normal bone density; using the [T score](#) it is T=-1.0 down to T= -2.4; once the T score is less than 2.4, the patient is defined as having [osteoporosis](#)

**osteoporosis:** a reduction in bone density resulting in a [T score](#) of -2.5 or less; a loss of bone due to increased [osteoclastic](#) activity leading to bone [resorption](#)

**overexpress:** produce in excess, as does the genetic material of cancer cells

**overstaging:** the assignment of an overly high [clinical stage](#) at initial diagnosis because of the difficulty of assessing the available information with accuracy (e.g., stage T3b as opposed to stage T2b)

**oxidant:** a substance that causes another substance to combine with oxygen

## P

**p27:** a [protein](#) that helps to regulate cell growth and a loss of p27 expression is associated with poor prognosis in prostate cancer

**p53:** a [protein](#) that detects and repairs [gene](#) damage, coordinating events that cause the cell to stop its growth and repair the damage. If the damage is too great, p53 becomes the [catalyst](#) directing the damaged cell to commit suicide.

**paclitaxel (Taxol®):** one of the [chemotherapy](#) agents called taxanes that block cell division

**palliative:** designed to relieve a particular problem without necessarily solving it; for example, palliative therapy is given in order to relieve symptoms and improve quality of life, but does not cure the patient

**palpable:** capable of being felt during a physical examination by an experienced physician; in the case of prostate cancer, this normally refers to some form of abnormality of the prostate which can be felt during a [digital rectal examination](#)

**palpation:** physical examination in medical diagnosis by pressure of the hand or fingers to the surface of the body especially to determine the condition (as of size or consistency) of an underlying part or organ

**pamidronate:** a disodium [bisphosphonate](#) bone-[resorption](#) inhibitor  $C_3H_9NNa_2O_7P_2$  administered as an [intravenous](#) infusion in the treatment of [hypercalcemia](#) associated with [malignancy](#) called also *pamidronate disodium*

**pancreas, pancreatic:** A gland situated near the stomach that secretes a digestive fluid into the intestine through one or more ducts and also secretes the [hormone insulin](#)

**PAP (prostatic acid phosphatase):** an [enzyme](#) or [biomarker](#) secreted by prostate cells associated with a higher probability of disease outside the prostate when levels are 3.0 or higher; PAP elevations suggest that the disease is not [OCD](#) (organ confined disease)

**papaverine:** a drug which causes blood vessels to expand, thereby increasing blood flow; when papaverine is injected into the penis, it produces an erection by increasing blood flow to the [penis](#); see also [phenolamine](#), "[bimix](#)", "[trimix](#)"

**paracrine:** a form of signaling in which the target cell is close to the signal-releasing cell; compare to [endocrine](#).

**paramagnetic:** a substance in which an induced magnetic field is parallel and proportional to the intensity of the magnetizing field but is much weaker than in ferromagnetic materials

**parathormone:** a [hormone](#) that regulates [ion](#) levels in [neurons](#) and controls excitability of the nervous system

**parathyroid hormone (PTH):** one of the principal calcium-regulating [hormones](#) in the body

**partial response (PR):** a 50% or greater decline in parameters that are being used to measure anti-cancer activity; parameters include abnormalities involving physical exam findings, lab and radiologic studies; also see [complete response \(CR\)](#)

**partial voluming:** the presence of different tissue types (e.g. healthy and malignant) within a [spectroscopic](#) volume leading to an averaging of the resulting spectra - a loss of resolution due to excessively large [voxels](#), typically caused by scan slices that are too thick

**Partin tables:** tables constructed based on results of the [PSA](#), [clinical stage](#) and [Gleason score](#) involving thousands of men with PC; used to predict the probability that the prostate cancer has spread to the [lymph nodes](#), [seminal vesicles](#), penetrated the [capsule](#) or that it remains confined to the prostate; developed by a group of scientists at the Brady Institute for Urology at Johns Hopkins University. [Related Paper](#)

**pathogen, adj. pathogenic:** an organism that causes disease in another organism

**pathologist:** a physician who specializes in the examination of tissues and blood samples to help decide what diseases are present and therefore how they should be treated

**pathology, pathological:** a science which specializes in the examination of tissues and blood samples to help decide what diseases are present and therefore how they should be treated

**PC, PCa:** abbreviations for prostate cancer

**PC-3:** human PC cell line that is [androgen independent](#)

**PCA3:** a specific [gene](#) that is profusely expressed in [prostate](#) cancer tissue, and not expressed in any other kind of human tissue

**PCA3 score:** ratio of [PCA3](#) to [PSA mRNA](#). See PCRI Paper [PCA3: A Genetic Marker of Prostate Cancer](#)

**PCNA (proliferating cell nuclear antigen):** an index of cell division or proliferation

**PCRI:** The Prostate Cancer Research Institute; a non-profit organization located in Los Angeles whose goal is to educate patients and physicians about PC; telephone number is 310-743-2116; Web site: [www.pcri.org](#)

**PC SPES:** a herbal therapy for PC comprised of 8 herbs that is no longer available

**Pd:** pyridinoline; a bone [resorption](#) marker; a bone [collagen](#) breakdown product

**PDGF:** platelet-derived growth factor; an important factor involved in [tumor](#) growth involving [angiogenesis](#)

**PDQ:** physicians data query; a NCI supported database available to physicians, containing current information on standard treatments and ongoing clinical trials

**pelvic lymph node dissection:** removal of [lymph nodes](#) in the area of the pelvis to check for presence of cancer

**pelvis, pelvic:** that part of the skeleton that joins the lower limbs of the body together

**penile:** of the penis

**penile bulb:** the base of the [penis](#) that attaches to the [perineal](#) membrane

**penis:** the male organ used in urination and intercourse

**peptide:** a compound of two or more [amino](#) acids where the alpha carboxyl group of one is bound to the alpha amino group of another

**percutaneous:** through the skin

**perfluorocarbon liquid:** a colorless and odorless liquid in which all hydrogen atoms have been replaced by fluorine atoms. This liquid is injected within the MEDRAD [endorectal coil](#) instead of air to increase image and spectral quality.

**perineal:** of the perineum; an area of the body between the [scrotum](#) and the [anus](#)

**perineum:** the area of the body between the [scrotum](#) and the [anus](#); a perineal procedure uses this area as the point of entry into the body

**perineural invasion (PNI):** PC invading the nerve sheath surrounding the nerves that enter the prostate

**peripheral:** outside the central region

**peripheral neuropathy (PN):** any disorder of the nervous system outside the brain and spinal column, such as tingling or numbness in the hands or feet

**peripheral zone:** the largest portion of the prostate located in the back closest to the [rectum](#)

**periprostatic:** pertaining to the soft tissues immediately adjacent to the prostate

**peritoneum**, adj. **peritoneal:** the [serous](#) membrane that lines the walls of the abdominal cavity and folds inward to enclose the [viscera](#)

**PET (positron emission tomography) scan:** using a [radioactive isotope](#) that is taken up by [tumor](#) tissue showing that the tumor is functional

**PGE-2 (prostaglandin E<sub>2</sub>):** an unfavorable [metabolite](#) of [arachidonic acid](#)

**phagocytosis:** the engulfing and ingesting of a substance within a cell; e.g. a [macrophage](#) may phagocytize bacteria or other cells

**pharmacologic:** the characteristics or properties of a drug, especially those that make it medically effective

**phase I, II or III clinical trial:** see [Clinical Trial](#)

**phentolamine:** given by injection causes blood vessels to expand, thereby increasing blood flow; when injected into the [penis](#), it increases blood flow to the penis, which results in an erection. see also [papaverine](#), "[bimix](#)", "[trimix](#)"

**phenotype**, adj. **phenotypic:** the observable physical or biochemical characteristics of an organism or group, as determined by both genetic makeup and environmental influences

**phosphodiesterase (PPD) inhibitors:** drugs which may help a man achieve an erection

**phosphorylation:** the addition of phosphate to an organic compound through the action of a phosphorylase or [kinase](#)

**photon:** A unit of energy of a light ray or other form of radiant energy. Most conventional [radiation](#) uses photons to deliver ionizing radiation.

**physiologic:** of or consistent with a living organism's normal functioning

**PI3 kinase:** an [enzyme](#) which influences a wide variety of cellular functions, including cell growth, differentiation and survival, glucose [metabolism](#) and [cytoskeletal](#) organization

**PICP:** carboxy-terminal propeptide of type 1 [procollagen](#); a bone formation marker

**PIN:** prostatic [intraepithelial](#) (or intraductal) [neoplasia](#); a [pathologically](#) identifiable condition characterized by microscopic changes in the [epithelial cells](#); also known more simply as dysplasia by many physicians; broken down into high-grade PIN or PIN 2 and PIN 3 or low-grade PIN or PIN 1. High grade PIN is what is believed to be a precursor to PC

**pituitary:** a small gland at the base of the brain that supplies [hormones](#) that control many body processes including the production of [testosterone](#) by the [testis](#)

**placebo:** a form of safe but non-active treatment frequently used as a basis for comparison with pharmaceuticals in research studies

**planimetry:** the measurement of plane surfaces

**planning target volume (PTV):** Equivalent to the [clinical](#) target volume plus a margin to account for uncertainty in immobilization and localization of the patient anatomy during treatment

**plasma:** The clear, yellowish fluid portion of blood, lymph, or intramuscular fluid in which cells are suspended. It differs from [serum](#) in that it contains fibrin and other soluble clotting elements.

**platelet:** a particle found in the bloodstream that binds at the site of a wound to begin the blood clotting process; platelets are formed in [bone marrow](#).

**plexus:** a structure in the form of a network, especially of nerves, blood vessels, or [lymphatics](#)

**ploidy:** a term used to describe the number of sets of [chromosomes](#) in a cell; see also [diploid](#) and [aneuploid](#)

**PNI:** [perineural invasion](#)

**polyamine:** Any of a group of organic compounds, such as [spermine](#) and [spermidine](#), composed of only carbon, nitrogen, and hydrogen and containing two or more [amino](#) groups

**polymerase chain reaction (PCR):** system for [in vitro](#) amplification of [DNA](#) that involves separating the DNA into its two complementary strands and using DNA [enzymes](#) to



synthesize two-stranded DNA from each single strand, and repeating the process

**polyphenol:** Any of a class of aromatic organic compounds comprised of more than one hydroxyl group (-OH) attached directly to a benzene ring

**positive:** the term used to describe a test result which shows the presence of the substance or material for which the test was carried out; for example, a positive [bone scan](#) would show signs of bone [metastases](#)

**positive margin:** the [pathologic](#) finding of cancer cells on the outer edge of the tissue removed

**positive predictive value:** refers to the chance that a positive test result will be correct.

**posterior:** the rear; for example, the posterior of the prostate is the part of the prostate that faces a man's back

**PPO:** preferred provider organization - an insurance plan which allows choice of any provider in the network

**PR (progesterone receptor):** the docking site on a cell that interacts with [progestins](#)

**preclinical:** before a disease becomes recognizable based on direct observation

**precursor:** a biochemical substance, such as an intermediate compound, from which a more stable or definitive product is formed

**prednisone (Orasone® or Deltasone® or Liquid Pred® or Meticorten®):** a glucocorticoid steroid used to treat [anorexia](#) and [cachexia](#) and some cancers. It is similar to a steroid hormone made by the adrenal glands in the body.

**priapism:** an abnormal, painful erection where the [penis](#) remains erect for an extended period of time that is usually not accompanied with sexual desire

**procollagen:** the soluble [precursor](#) of [collagen](#)

**Procrit®:** a recombinant human [erythropoietin](#) used to treat anemia

**proctitis:** inflammation of the rectum; in PC therapy may be associated with radiation therapy

**progesterone:** a specific [steroid](#) hormone used in the treatment of [hot flashes](#) in men having suppressions in [LH](#) and [testosterone](#); an example of a progestin is Megace® or Depo-Provera®

**prognosis:** the patient's potential [clinical](#) outlook based on the status and probable course of his disease; chance of recovery

**progression:** continuing growth or regrowth of the cancer

**prolactin (PRL):** a trophic [hormone](#) produced by the [pituitary](#) that increases [androgen receptors](#), increases sensitivity to androgens & regulates production & secretion of citrate

**proliferative inflammatory atrophy (PIA):** chronic [inflammatory](#) prostate [lesions](#) that may result in prostate cancer

**prone:** referring to the position of the body when lying face downward

**prophylactic, prophylaxis:** a drug, procedure or piece of equipment used to prevent disease

**Proscar®:** brand name of finasteride; a [5 AR](#) inhibitor

**prospective:** relating to or being a study (as of the incidence of disease) that starts with the present condition of a population of individuals and follows them into the future -- compare [retrospective](#)

**prostaglandin:** [hormone](#) like substances that stimulate target cells into action; they differ from hormones in that they act locally, near their site of synthesis, and they are metabolized very rapidly; any of various oxygenated unsaturated cyclic fatty acids of animals that have a variety of hormone like actions (as in controlling blood pressure or smooth muscle contraction)

**ProstaScint®:** a [monoclonal antibody](#) test directed against the prostate specific membrane antigen ([PSMA](#)); seems to focus on [androgen independent tumor](#) tissue which may contain a greater amount of PSMA

**prostate:** the gland surrounding the [urethra](#) and immediately below the [bladder](#) in males which provides fluid to nourish and transport [sperm](#) during intercourse

**prostatectomy:** surgical removal of part or all of the prostate gland

**prostate specific antigen (PSA):** a protein secreted by the [epithelial cells](#) of the prostate gland including cancer cells; an elevated level in the blood indicates an abnormal condition of the prostate gland, either [benign](#) or [malignant](#); it is used to detect potential problems in the prostate gland and to follow the progress of PC therapy (see [screening](#))

**prostate-specific membrane antigen (PSMA):** a [biomarker](#) of prostate [epithelial cell](#) activity that is expressed in the membrane of prostate epithelial cells. PSMA is composed of a short 19 [amino acid](#) intra-cellular domain, a 24 amino acid transmembrane domain and a 707 amino acid extra-cellular domain. PSMA [antigen](#) is radiologically identified (imaged) using a [monoclonal antibody](#) attached to a radioactive Indium 111 isotope (ProstaScint scan) to allow visualization of PSMA antigen-containing tissue found within [lymph nodes](#) and/or prostate gland.

**prostatic acid phosphatase (PAP):** an [enzyme](#) or [biomarker](#) secreted by prostate cells associated with a higher probability of disease outside the prostate when levels are 3.0 or higher; PAP elevations suggest that the disease is not OCD (organ confined disease)

**prostatism:** a symptom resulting from compression or obstruction of the [urethra](#), due most commonly to [hyperplasia](#) of the prostate; results in urinary difficulties and, occasionally, [urinary](#) retention

**prostatitis:** infection or [inflammation](#) of the prostate gland treatable by medication and/or manipulation; ([BPH](#) is a more

permanent laying down of fibrous and connective tissue caused when the prostate tries to contain a relatively silent chronic lower-grade infection, often requiring a [TURP](#) to relieve the symptoms)

**prosthesis:** a manufactured device used to replace a normal body part or function

**protease:** any [enzyme](#) that catalyzes the splitting of [proteins](#) into smaller [peptide](#) fractions and [amino](#) acids by a process known as proteolysis

**protease inhibitor:** a substance that inhibits the action of a [protease](#)

**protein:** any of a group of complex organic macromolecules that contain carbon, hydrogen, oxygen, nitrogen, and usually sulfur and are composed of one or more chains of [amino](#) acids. Proteins are fundamental components of all living cells and include many substances, such as [enzymes](#), [hormones](#), and [antibodies](#), that are necessary for the proper functioning of an organism. They are essential in the diet of animals for the growth and repair of tissue and can be obtained from foods such as meat, fish, eggs, milk, and legumes

**protocol:** a precise set of methods by which a treatment or research study is to be carried out

**proton beam radiation therapy:** a form of RT that uses the proton, a positively charged nuclear particle, to deliver ionizing radiation. The proton can be programmed to stop at a particular depth within tissue for the delivery of its radiation payload

**proton pump inhibitors (PPI):** drugs that reduce gastric acidity by inhibiting the proton pump within the gastric lining cells; examples of PPI include Prilosec® and Nexium®

**proximal:** a part of the body that is nearer to the point of reference, compare to [distal](#)

**PSA:** see [prostate-specific antigen](#).

**PSA density (PSAD):** The amount of [PSA](#) per unit volume of the prostate gland; the quotient of PSA divided by gland volume; a reflection of tumor density within the prostate

**PSA doubling time (PSADT):** the calculation of the time it takes for the [PSA](#) value to double based on at least three values separated by at least three months each; before diagnosis, a PSADT of less than 10 years may be an indication of the presence of PC

**PSA failure:** the [ASTRO](#) definition of [PSA](#) failure as being three consecutive increases in PSA level following treatment

**PSA II:** see [free PSA](#).

**PSA mRNA:** messenger [RNA](#) which replicates the [DNA](#) code of the [PSA](#) protein

**PSA nadir (PSAN):** the lowest value the [PSA](#) reaches during or after a particular treatment; a progressive rise after a PSA nadir has been reached usually indicates biologic activity of PC

**PSA relapse-free survival:** survival of the PC patient that relates to no evidence of [biochemical](#) relapse based on a

rising [PSA](#) as seen in 3 consecutive determinations; also called biochemical relapse-free survival ( bRFS)

**PSA slope:** the rate of rise in the [PSA](#) level normally expressed as ng/mL per month

**PSA velocity (PSAV):** the calculation of the rate of increase in [PSA](#) levels in succeeding PSA tests; before diagnosis, a PSAV of 0.75 ng/ml/year (or higher) may be an indication of the presence of PC

**PSM:** prostate specific membrane; a membrane that surrounds the protoplasm (cytoplasm) of prostate cells

**PSMA:** [prostate specific membrane antigen](#)

**psychogenic:** produced or caused by psychological or mental factors rather than organic factors; compare to [neurogenic](#)

**PTEN:** a [gene](#) acts as a [tumor](#) suppressor gene by deactivating [Akt](#) and rendering prostate cancer cells more susceptible to suicide

**PTHrP:** Parathyroid hormone-related protein; a protein involved in [osteoblast](#) stimulation; a product also of the PC cell elaborated by [neuroendocrine](#) cells that make [CGA](#) (chromogranin A)

**Pub Med:** a Web site which allows access to thousands of published medical studies. It is a service of the National Institute of Health and can be found at [www.pubmed.com](#)

**pubic arch:** the arch formed by the inferior [rami](#) of the pubic bones

**pulmonary embolism:** a blood clot in a lungs, causing a severe impairment of respiratory function

**Pyrilinks-D (Dpd):** a urine test that quantitates bone [resorption](#); the second voided urine specimen is ideal to use; other markers of bone resorption are [ICTP](#) and [N-telopeptide](#)

**pyrophosphate:** a salt or ester of pyrophosphoric acid

## Q

**qCT:** quantitative CT bone densitometry; an alternate way to evaluate bone density besides the [DEXA](#) scan; qCT is not falsely elevated due to calcium deposits in blood vessels or due to degenerative joint disease

**quality of life (QOL):** an evaluation of health status relative to the patient's age, expectations and physical and mental capabilities

## R

**RAD:** A unit of absorbed radiation dose, 100 rads = 1 joule/kg = 1 Gray

**radiation cystitis:** [inflammation](#) of the [bladder](#) lining due to the ionizing effects of [radiation therapy](#)

**radiation oncologist:** a physician who has received special training regarding the treatment of cancers with different types of [radiation](#)

**radiation proctitis:** [inflammation](#) of the [rectal mucosa](#) lining due to the ionizing effects of [radiation therapy](#)

**radiation therapy (RT):** the use of [X-rays](#) and other forms of radiation to destroy [malignant](#) cells and tissue

**radical:** (in a surgical sense) directed at the cause of a disease; thus, [radical prostatectomy](#) is the surgical removal of the prostate with the intent to cure the problem believed to be caused by or within the prostate

**radical prostatectomy (RP):** an operation to remove the entire [prostate](#) gland and [seminal vesicles](#) - see our paper: [Radical Prostatectomy](#).

**radio sensitivity:** the degree to which a type of cancer responds to [radiation therapy](#)

**radiobiology** adj. **radiobiological:** the study of the effects of radiation on living organisms

**radiography:** producing an image by radiation other than visible light, e.g., x-rays of one's teeth is done by radiography.

**radioimmunometric:** a measurement using radioimmunology, a system for testing [antigen antibody](#) reactions using radioactive labelling of antigen or antibody to detect the extent of the reaction

**radioisotope:** a type of atom (or a chemical which is made with a type of atom) that emits radioactivity

**radiolabeled, radiolabel:** an [antibody](#) that has been joined with a radioactive substance

**radiology:** the branch of medicine that deals with radioactive substances for diagnosing and treating disease

**radionuclide:** an unstable form of a chemical element that radioactively decays, resulting in the emission of nuclear radiation

**radiopharmaceutical:** a drug containing a radioactive substance that is used in the diagnosis and treatment of cancer and in pain management of bone [metastases](#). Also called a radioactive drug.

**radiotherapy:** see [radiation therapy](#)

**ramus, pl. rami:** the arch formed by the inferior rami of the pubic bones

**randomized:** the process of assigning patients to different forms of treatment in a research study in a random manner

**rapamycin, also called sirolimus (Rapamune®):** a [peptide](#) drug used to help prevent the body from rejecting organ and bone marrow transplants. It is also has been shown to block one of the survival pathways under [Akt](#) control

**rb:** a [protein](#) which plays an important role in sensing whether appropriate growth factors and nutrients are present to allow for cell growth and division; loss of Rb fosters the evolution of hormone-resistant disease and may impair the response to [radiation therapy](#)

**receptor:** a docking site which interacts with a [ligand](#); receptors may be on the cell membrane or within the cell [cytoplasm](#) or [nucleus](#); [estrogen](#) receptors and androgen receptors are examples; all cells have multiple receptors

**rectal exam:** see [digital rectal examination](#)

**rectoprostatic:** the area between the prostate and its neighboring [rectal](#) wall

**rectum** adj. **rectal:** the final part of the intestines that ends at the [anus](#)

**recurrence:** the reappearance of disease; this can be manifested [clinically](#) as findings on the physical examination (e.g. [DRE](#)) or as a laboratory recurrence only (e.g. rise in PSA)

**refractory:** resistant to therapy; e.g., [hormone refractory prostate cancer](#) is resistant to forms of treatment involving hormone manipulation

**regression:** reduction in the size of a single [tumor](#) or reduction in the number and/or size of several tumors

**remission:** the real or apparent disappearance of some or all or the signs and symptoms of cancer; the period (temporary or permanent) during which a disease remains under control, without progressing; even complete remission does not necessarily indicate cure

**renal:** pertaining to the kidneys

**resection:** surgical removal

**resectoscope:** instrument inserted through the [urethra](#) and used by a [urologist](#) to cut out tissue (usually from the prostate) while the physician can actually see precisely where he is cutting

**resistance:** (in a medical sense) a patient's ability to fight off a disease as a result of the effectiveness of the patient's [immune system](#)

**resorption:** loss of bone through increased breakdown via [osteoclasts](#) or other mechanism causing a reduction in bone mass

**response:** a decrease in disease that occurs because of treatment; divided into complete response(remission) or partial response(remission)

**retention:** difficulty in initiation of urination or the inability to completely empty the [bladder](#)

**reticuloendothelial:** the widely diffused bodily system constituting all [phagocytic](#) cells except certain white blood cells

**retinoid:** derivatives of vitamin A used clinically in the treatment of severe acne and psoriasis; under investigation for treating cancer

**rectoprostatic:** the area between the prostate and its neighboring [rectal](#) wall

**retropubic prostatectomy:** surgical removal of the prostate through an incision in the [abdomen](#) above the pubic bones

**retrospective:** relating to a study (as of a disease) that starts with the present condition of a population of individuals and collects data about their past history to explain their present condition – compare to [prospective](#)

**ribosome:** A minute round particle composed of [RNA](#) and protein that is found in the [cytoplasm](#) of living cells and serves as the site of assembly for polypeptides encoded by messenger RNA

**risk:** the chance or probability that a particular event will or will not happen

**risk factor:** that which causes an individual or group of individuals to have an increased risk of a condition or disease

**RNA (ribonucleic acid):** found mostly in the [cytoplasm](#) of cells is important in the synthesis of [proteins](#). It is a chain made up of subunits called nucleotides. Messenger RNA (mRNA) replicates the [DNA](#) code for a protein and moves to organelles (specialized cell structures) called ribosomes, which are themselves composed of protein and a type of RNA called ribosomal RNA (rRNA). At the ribosomes, transfer RNA (tRNA) assembles [amino](#) acids to form the protein specified by the messenger RNA.

**robotic prostatectomy:** a new minimally invasive type of surgery that features [telemanipulation](#) devices allowing the performance of complex surgical tasks with dexterity and minimal fatigue due to their ergonomic design. They also provide expanded degree of movements, tremor filtering, and 3-D stereoscopic visualization. (see [article re: robotic prostatectomy](#))

**RP:** see [radical prostatectomy](#)

**RT-PCR:** reverse transcriptase polymerase chain reaction; a technique which allows a physician to search for tiny quantities of a protein, such as [PSA](#), in the blood or other body fluids and tissues; see RT-PCR PSA

**RT-PCR PSA:** reverse transcriptase-polymerase chain reaction; a blood test that detects [micrometastatic](#) cells circulating in the blood stream; may be useful as a screening tool to help avoid unnecessary invasive treatments (RP, RT, etc.) on patients with [metastasized](#) PC

**Rx:** standard abbreviation for medication prescribed

## S

**sagittal:** a plane, slice or section of the body cutting from front to back through the sagittal suture of the skull, and continued down through the body in the same direction, dividing it into two parts

**sagittal localizer:** an anatomic image which is acquired quickly to provide information about how to select high resolution images of the organ of interest - specifically, the first imaging sequence acquired for a prostate [MRI/MRSI](#) exam to determine the proper placement of the [endorectal coil](#) and prescribe other images acquired during the exam. See our paper [Magnetic Resonance Anatomic and Spectroscopic Imaging of Prostate Cancer](#)

**salvage:** a procedure intended to "rescue" a patient following the failure of a prior treatment; for example, a

salvage [prostatectomy](#) would be the surgical removal of the prostate after the failure of prior [radiation therapy](#) or [cryosurgery](#)

**Sandostatin®:** trade name for [octreotide](#)

**SARM (selective androgen receptor modulator):** a drug that selectively inhibits [androgen receptors](#) of a specific tissue(s) while allowing the normal interaction of the androgen with androgen receptors at other sites (see SERM)

**saturation biopsy:** a systematic [biopsy](#) using 3-D mapping to obtain thorough coverage of a half or the full prostate involving as many as 30-80 samples, depending on gland volume

**saw palmetto:** The dwarf palm plant indigenous to Florida that is the source of *Serenoa repens* and its lipid extract (lipido-sterol extract of [Serenoa repens](#) or LSESr) that is sometimes used for treating [BPH](#)

**SCF:** stem cell factor

**sclerotic:** [tissue] hardened by causes like inflammation, mineral accumulation, etc.

**screening:** evaluating populations of people to diagnose disease early

**scrotum:** the pouch of skin containing a man's [testicles](#)

**secondary to:** derived from or consequent to a primary event or thing

**secretion:** 1. the process of secreting (releasing) a substance, especially one that is not a waste, from the blood or cells;  
2. a substance, such as saliva, mucus, tears, bile, or a hormone, that is secreted

**seed, seeding:** [brachytherapy](#); the implantation of radioactive seeds or pellets (may also be called "capsules") which emit low energy radiation in order to kill surrounding tissue, e.g., the prostate, including prostate cancer cells. Also known as "seed implantation" or "SI" - See our paper [Prostate Seed Implantation for Prostate Cancer](#).

**selenium:** a relatively rare nonmetallic element found in food in small quantities that has some effect in prevention of prostate cancer

**semen:** the whitish, opaque fluid emitted by a male at [ejaculation](#)

**seminal:** related to the [semen](#); for example, the [seminal vesicles](#) are structures at the base of the [bladder](#) and connected to the prostate that provide nutrients for the semen

**seminal vesicles (SV):** glandular structures located above and behind the prostate that secrete and store [seminal](#) fluid; the seminal vesicles connect with the [ejaculatory ducts](#); the seminal fluid contains nutrients for the [sperm](#) that improves their viability and mobility

**seminal vesicle invasion or involvement (SVI):** prostate cancer cells are found in the [seminal vesicle\(s\)](#)

**senescence:** the state of being old the process of becoming old

**sensitivity:** the probability that a diagnostic test can correctly identify the presence of a particular disease assuming the proper conduct of the test; specifically, the number of true positive results divided by the sum of the true positive results and the false negative results; see [specificity](#)

**sequential androgen blockade (SAB):** a variation of [ADT](#) involving a two-medication ([anti-androgen](#) plus a [5 alpha reductase inhibitor](#)) approach intended to stop PC growth using [androgen deprivation](#) focused at the level of the [tumor cell](#), while at the same time maintaining normal [serum testosterone](#) levels so that the sexual function will hopefully be preserved

**Serenoa repens:** the dwarf palm and source of the active herb used in [saw palmetto](#) preparations such as permixon. Serenoa blocks various pathways in [testosterone](#) metabolism such as the conversion of testosterone to [androstenedione](#) as well as the conversion of testosterone to [DHT](#). By itself, Serenoa repens is used in the treatment of [LUTS](#). See the July 99 issue of [Insights](#) (page 2-3) for details on Serenoa repens.

**SERM (selective estrogen receptor modulator):** a drug that selectively blocks one [estrogen receptor](#) but allows the other receptors at specific sites to function normally with estrogen; raloxifene is an example of a SERM- it blocks the ER in the breast and uterine tissue but allows the ER in bone tissue to be operative

**seroma:** a mass or swelling caused by the localized accumulation of [serum](#) within a tissue or organ

**serotonin:** [neurotransmitter](#) that relays impulses between nerve cells (neurons) in the central nervous system. Serotonin is involved in mood and behavior, physical coordination, appetite, body temperature, and sleep.

**serous:** of, relating to, producing, or resembling serum; especially : having a thin watery constitution

**serum:** any clear, watery fluid such as the pale yellow liquid that separates from the clot in the coagulation of blood

**sex hormone binding globulin (SHBG):** a protein that binds [testosterone](#) to make it unavailable for function; SHBG production is increased by [estrogens](#) such as [DES](#). SHBG binds to [DHT](#) four times more avidly than to testosterone.

**sextant:** having six parts; thus, a sextant [biopsy](#) is a biopsy that takes six samples

**SGOT: serum glutamic-oxaloacetic transaminase;** a liver cell [enzyme](#); elevation of SGOT is seen as an effect of liver cell injury by drugs, alcohol and viruses. Supplements such as silymarin, alpha lipoic acid and curcumin may protect and repair the liver cell and help reduce elevations of SGOT.

**SGPT: serum glutamic pyruvic transaminase;** a liver cell [enzyme](#); elevation of SGOT is seen as an effect of liver cell injury by drugs, alcohol and viruses

**SI: seed implantation;** insertion of radioactive seeds, usually iodine 125 or palladium 103 into the prostate tissue to

destroy prostate cancer (PC); see [brachytherapy](#); see our paper [Prostate Seed Implantation for Prostate Cancer](#).

**side effect:** a reaction to a medication or treatment (most commonly used to mean an unnecessary or undesirable effect)

**sign:** physical changes which can be observed as a consequence of an illness or disease

**signal excitation:** the excitation of signals using a strong magnetic field and radio frequency (RF) pulses to produce resonances or peaks due to water or other chemicals (metabolites) within tissue

**sildenafil:** the active ingredient of Viagra®, which may help to produce erections

**sinusoidal:** any of the venous cavities through which blood passes in various glands and organs, such as the [adrenal gland](#) and the liver

**skeletal-related events:** include bone fracture, spinal cord compression or the need for radiation or surgery for the treatment of bone [metastasis](#)

**small cell PC:** an aggressive variant of prostate cancer with a tendency to [metastasize](#) early due to rapidly dividing cells

**sonogram, sonographic:** an image of a structure that is produced by ultrasonography

**spatial-resolution:** a term that refers to the number of pixels utilized in construction of a digital image - images having higher spatial resolution have a greater number of pixels

**specificity:** the probability that a diagnostic test can correctly identify the absence of a particular disease assuming the proper conduct of the test; specifically, the number of true negative results divided by the sum of the true negative results and the false positive results; a method that detects 95% of true PC cases is highly sensitive, but if it also falsely indicates that 40% of those who do not have PC do have PC then its specificity is only 60%; see [sensitivity](#).

**SPECT: (single photon emission computed tomography) -** Tomography using emissions from [radionuclides](#) and a computer algorithm to reconstruct the image. SPECT allows visualization of the body in slices from recalculated planar views of the patient.

**spectroscopy:** the science of measuring the emission and absorption of different wavelengths (spectra) of visible and non-visible light

**sperm:** a male reproductive cell

**spermidine:** A [polyamine](#) compound, C<sub>7</sub>H<sub>19</sub>N<sub>3</sub>, found in [ribosomes](#) and living tissues and having various metabolic functions. It was originally isolated from semen

**spermine:** A crystalline [polyamine](#) compound, C<sub>10</sub>H<sub>26</sub>N<sub>4</sub>, present in [ribosomes](#) and found widely in living tissues along with [spermidine](#). It was originally isolated from [semen](#)

**sphincter:** a muscle which surrounds, and by its contraction tends to close, a natural opening; as, the sphincter of the [bladder](#)

**stage:** a term used to define the size and physical extent of a cancer

**staging:** the process of determining extent of disease in a specific patient in light of all available information; it is used to help determine appropriate therapy; there are two staging methods: the Whitmore-Jewett staging classification (1956) and the more detailed TNM (tumor, [lymph nodes](#), [metastases](#)) classification (1992) of the American Joint Committee on Cancer and the International Union Against Cancer. Staging should be subcategorized as [clinical](#) staging and [pathologic](#) staging. Clinical stage is based on the [digital rectal exam](#) findings. Pathologic stage usually relates to what is found at the time of surgery. The TNM system is now most commonly used.

For diagrams, see our paper [The Clinical Stage: Its Definition and Importance in Prostate Cancer](#).

#### - - TNM stages:

##### T Primary Tumor

T<sub>x</sub>: Primary tumor cannot be assessed  
T<sub>0</sub>: No evidence of primary tumor  
T1: Clinically inapparent tumor not palpable or visible by imaging  
T1a: Tumor incidental [histologic](#) finding in > 5% of tissue resected via TURP  
T1b: Tumor incidental histologic finding > 5% of tissue resected via TURP  
T1c: Tumor identified by needle [biopsy](#) (e.g., because of elevated PSA)  
T2: Tumor palpable but confined within the prostate  
T2a: Tumor involves half of a lobe or less  
T2b: Tumor involves more than half a lobe, but not both lobes  
T2c: Tumor involves both lobes  
T3: Tumor extends through the prostatic capsule  
T3a: Unilateral extracapsular extension  
T3b: Bilateral extracapsular extension  
T3c: Tumor invades the [seminal vesicle\(s\)](#)  
T4: Tumor is fixed or invades adjacent structures other than the seminal vesicles  
T4a: Tumor invades any of bladder neck, external [sphincter](#) or [rectum](#)  
T4b: Tumor invades [levator](#) muscles and/or is fixed to the [pelvic](#) wall

##### N Regional Lymph Nodes

N<sub>x</sub>: Regional lymph nodes cannot be assessed  
N<sub>0</sub>: No regional lymph nodes metastasis  
N1: Metastasis in a single lymph node, 2 cm or less in greatest dimension  
N2: Metastasis in a single lymph node, more than 2 cm but not more than 5cm in greatest dimension; or multiple lymph node metastases, none more than 5 cm in greatest dimension  
N3: Metastasis in a lymph node more than 5 cm in greatest dimension

##### M Distant Metastases

M<sub>x</sub>: Presence of distant metastasis cannot be assessed  
M<sub>0</sub>: No distant metastasis  
M1: Distant metastasis  
M1a: Nonregional lymph node(s)  
M1b: Bone(s)  
M1c: Other site(s)

#### - - Whitmore-Jewett Stages:

**stage A** is clinically undetectable [tumor](#) confined to the gland and is an incidental finding at prostate surgery.

A1: well-[differentiated](#) with focal involvement  
A2: moderately or poorly differentiated or involves multiple foci in the gland

**stage B** is tumor confined to the prostate gland.

BO: non-[palpable](#), PSA-detected  
B1: single nodule in one lobe of the prostate  
B2: more extensive involvement of one [lobe](#) or involvement of both lobes

**stage C** is a tumor clinically localized to the periprostatic area but extending through the prostatic [capsule](#); seminal vesicles may be involved.

C1: [clinical extracapsular extension](#)  
C2: extracapsular tumor producing bladder outlet or ureteral obstruction

**stage D** is [metastatic](#) disease.

DO: clinically localized disease (prostate only) but persistently elevated enzymatic serum acid phosphatase  
D1: regional lymph nodes only  
D2: distant lymph nodes, metastases to bone or visceral organs  
D3: D2 prostate cancer patients who relapse after adequate endocrine therapy

**stem cell:** cell that has the ability to divide for indefinite periods in culture and to give rise to specialized cells; the ultimate stem cell might be a fertilized egg capable of producing the entire organism

**stenosis:** abnormal narrowing of a bodily canal or passageway

**stent:** a tube used by a surgeon to drain fluids

**step-section histopathology:** the sectioning of diseased tissues into ordered slices used for microscopic analysis

**stepper:** a motor (especially an electric motor) that moves or rotates in small discrete steps

**steroid:** any one of the [hormones](#) made in the outer layer of the [adrenal](#) glands (adrenal cortex)

**stratified:** In an analysis of data, a particular [clinical](#) or [pathologic](#) feature(s) is used as the basis for comparison, e.g. [clinical stage](#), pathologic stage, [PSA](#), Gleason score

**stress incontinence:** passing a small amount of urine when coughing, lifting, etc.

**stricture:** scarring as a result of a procedure or an injury that constricts the flow of a fluid; for example, a urethral stricture would restrict the flow of urine through the [urethra](#)

**stroma:** the supporting tissue of an organ

**stromal BPH:** a non-cancerous cause of prostate enlargement ([BPH](#)) within the connective tissue framework of the prostate

**strontium-89:** an injectable radioactive product that is used to relieve bone pain in some patients with prostate cancer that no longer responds to [hormones](#) or appropriate forms of [chemotherapy](#)

**subcapsular:** under the capsule; for example, a subcapsular [orchiectomy](#) is a form of [castration](#) in which the contents of each [testicle](#) is removed but the testicular capsules are then closed and remain in the [scrotum](#)

**subcutaneous:** located, found, or placed just beneath the skin

**SUO:** Society of Urologic Oncology

**superficial :** pertaining to or situated near the surface, especially relating to the skin

**suprapubic:** above the pubic bone; a suprapubic tube is placed into the [bladder](#) by puncturing the skin and soft tissue above the pubic bone

**surgical margins:** the outer edge of the tissue removed during surgery

**suture:** surgical stitching used in the closure of a cut or incision

**SVI:** see [seminal vesicle invasion](#).

**symptom:** a feeling, sensation or experience associated with or resulting from a physical or mental disorder and noticeable by the patient

**symptomatic:** having symptoms, evidence of disease

**synergistic:** assists or adds to the activity of another substance, such as a drug

**systematic biopsy:** sampling of various sectors of the [prostate](#) under [ultrasound](#) guidance

**systemic:** throughout the whole body; affecting the entire body

**Sx:** an abbreviation for symptoms

## T

**T-cell:** An [immune-system](#) cell that orchestrates an immune response to infected or [malignant](#) cells, sometimes by direct contact with the abnormal cells; T-cells are [lymphocytes](#) that develop in the [thymus](#) and circulate in the blood and [lymphatic system](#); see [dendritic cell](#).

**T-score:** a comparison of an individual's bone mass with the average bone mass of a young adult; a negative indicates a loss of bone density; see [osteopenia](#) and [osteoporosis](#)

**T1a, T1b, T1c, T2a, T2b, T2c, T3a, T3b, T3c, T4:** see [staging](#)

**tamoxifen:** the generic name for Nolvadex®; an anti-[estrogen](#) that works by blocking the [estrogen receptor](#) (ER) on the cell.

**target capture:** ([genetics](#)) a process that isolates the target [nucleic acid](#) from [clinical](#) specimens and purifies the nucleic acid for amplification

**taxanes:** anticancer drugs that inhibit cancer cell growth by stopping cell division. Includes [paclitaxel](#) and [docetaxel](#).

**Taxol®:** the trade name for [paclitaxel](#)

**Taxotere®:** trade or brand name for [docetaxel](#), a [chemotherapy](#) agent

**TCAP:** targeted [cryoablation](#) of the prostate

**telemanipulation:** the direct human control of a robotic manipulator, where the operator and the manipulator are at different locations

**tesla:** unit of measurement to describe magnetic field strength

**testicle, adj. testicular:** see [testis](#)

**testis, pl. testes:** one of two male reproductive glands located inside the [scrotum](#) that are the primary sources of the male hormone [testosterone](#)

**testosterone (T):** the male [hormone](#) or [androgen](#) which comprises most of the androgens in a man's body; chiefly produced by the [testicles](#) but also is derived from [adrenal androgen](#) precursors such as [DHEA](#) and [androstenedione](#). T is highly important to a man's sexual interest or [libido](#) and his ability to achieve erection. T plays a key role in virtually every tissue in the human body e.g. brain, bone, blood formation, skin, nails, muscle.

**testosterone inactivating pharmaceuticals (TIP):** also known as [androgen deprivation therapy](#) (ADT) or [hormone therapy](#).

**tetraploid:** having two times the normal amount of [DNA](#) or [chromosomal](#) material

**TGF-b (transforming growth factor beta):** a bone-derived growth factor that stimulates the PC cell and [osteoblast](#), among many other functions

**thalidomide:** a drug that belongs to the family of drugs called [angiogenesis](#) inhibitors. It prevents the growth of new blood vessels into a solid [tumor](#).

**therapeutic:** the treatment of disease or disability

**therapeutic index:** an index based on the ratio of [tumor](#) control probability (TCP) to normal tissue complication probability (NTCP) used in radiation therapy to assess the likelihood of effective treatment vs. the likelihood damage to surrounding tissues

**therapy:** the treatment of disease or disability

**thermocouple:** a thermoelectric device used to measure temperatures accurately

**thermoluminescent dosimeter:** A device that registers the radiation dose (energy per unit mass) indicated by changes in color induced by temperature change. A device that directly measures absorbed dose

**thoracic:** pertaining to or affecting the chest.

**thrombocytopenia:** a blood disorder in which there are not enough platelets. Platelets are cells in the blood that help blood to clot.

**thromboembolism, thromboembolic:** the blocking of a blood vessel by a blood clot dislodged from its site of origin

**thrombosis:** the formation or presence of a thrombus (a clot of coagulated blood attached at the site of its formation) in a blood vessel

**thymus:** a small glandular organ that is situated behind the top of the sternum (breastbone), consisting mainly of [lymphatic](#) tissue and serving as the site of [T cell](#) differentiation. The thymus increases gradually in size and activity until puberty, becoming [atrophic](#) thereafter

**tibial:** of or pertaining to a tibia (the larger bone of the lower leg)

**tissue vascularity:** the state at which a tissue circulates an adequate flow of liquid components such as blood and nutrients within its [vessels](#)

**TNF-alpha:** tumor necrosis factor alpha; a protein produced by [macrophages](#) in the presence of an [endotoxin](#) and shown experimentally to be capable of attacking and destroying cancerous [tumors](#)

**TNM** (tumor, nodes, metastases): see [staging](#)

**tomography:** a procedure where internal body images at a predetermined plane are recorded by means of the tomograph, a computer-driven device that builds the image from multiple X-ray measurements; tomography is used in CAT scan and PET scan

**tomotherapy:** Rotational radiotherapy delivery using an intensity-modulated fan beam. Intensity-modulated delivery is achieved by moving multiple [collimator](#) vanes into and out of the fan beam. The length of time that a leaf spends out of the beam is proportional to the intensity of radiation allowed through that particular portion of the beam

**total PSA:** the total of [free PSA](#) plus [bound PSA](#)

**toxicity:** the degree to which something is poisonous

**transcription:** ([genetics](#)) the synthesis of [mRNA](#) from a [DNA](#) template

**transcription mediated amplification (TMA):** a process that uses two [enzymes](#), Reverse Transcriptase and RNA Polymerase, to produce billions of copies of [RNA](#) amplified target from the purified target [nucleic acid](#)

**transducer:** a substance or device that converts input energy of one form into another

**transition zone:** area of the prostate closest to the [urethra](#) which has features that distinguish it from the much larger [peripheral](#) zone

**translation:** ([genetics](#)) the process by which the [mRNA](#) code is converted to a sequence of [amino](#) acids (a [protein](#))

**translational research:** a sharing of information between laboratory research and patient care, often referred to as "from bench to bedside"

**transperineal:** through the [perineum](#)

**transrectal:** through the [rectum](#)

**transurethral:** through the [urethra](#)

**transurethral resection (TUR):** see [TURP](#).

**transverse:** acting, lying, or being across : set crosswise

**trastuzumab (Herceptin®):** a type of [monoclonal antibody](#) which blocks the effects of the growth factor protein HER2, which transmits growth signals to cancer cells

**treatment (Tx):** administration of remedies to a patient for a disease

**trimix, tri-mix:** a mixture of [papaverine](#), [phentolamine](#) and [prostaglandin](#) E-1 that is injected into the [penis](#) to cause an erection.

**trophic:** the starting of cell reproduction and enlargement by nurturing and causing growth

**tropism:** the movement of an organism in response to an external source of stimulus

**true pelvis, true pelvic cavity:** the lower more contracted part of the [pelvic](#) cavity

**TRUS (transrectal ultrasound):** a method that uses echoes of [ultrasound](#) waves (far beyond the hearing range) to image the prostate by inserting an ultrasound probe into the [rectum](#); commonly used to visualize and guide prostate [biopsy](#) procedures

**TRUSP:** see [TRUS](#)

**tumor:** an excessive growth of cells caused by uncontrolled and disorderly cell replacement; an abnormal tissue growth that can be either benign or malignant; see [benign](#), [malignant](#)

**tumorigenesis, tumorigenic:** the formation of [tumors](#) or tendency to form tumors

**TURP (transurethral resection of the prostate):** a surgical procedure to remove tissue obstructing the [urethra](#); the technique involves the insertion of an instrument called a [resectoscope](#) into the penile urethra, and is intended to relieve obstruction of urine flow due to enlargement of the prostate

**Tx:** an abbreviation for treatment

**tyrosine kinase:** an [enzyme](#) involved in communication within cells, or signaling pathways

## U

**ultrasound (US):** sound waves at a particular frequency (far beyond the hearing range) whose echoes bouncing off tissue can be used to image internal organs



**understaging:** the assignment of an overly low [clinical stage](#) at initial [diagnosis](#) because of the difficulty of assessing the available information with accuracy (e.g., stage T2b as opposed to stage T3b)

**undetectable PSA (UDPSA):** defined in our research as a [PSA](#) of <0.05 using a hypersensitive assay

**unit:** a blood-banking term for a pint of blood or plasma but can be used to quantitate other blood products such as [platelets](#)

**uPA (urokinase-like plasminogen activator):** a protease or digestive [enzyme](#) that is made by the PC cell, stimulates PC cell and [osteoblast](#) growth, and is involved with invasion and [metastasis](#)

**uPM3 urine test:** a new molecular test for detecting prostate cancer cells based on PCA3, a specific gene that is profusely expressed in prostate cancer tissue. Patients who receive the uPM3(TM) undergo a thorough [digital rectal prostate examination](#) by a urologist which causes cells from the patient's prostate to be shed into the urine. See our paper [PCA3: A Genetic Marker of Prostate Cancer](#).

**up-regulation:** the process of increasing the response to a stimulus

**uptake:** the absorption by a tissue of a substance, such as a nutrient, and its permanent or temporary retention

**urea:** the main nitrogen part of urine made from protein breakdown

**uremia:** the presence of excessive amounts of [urea](#) and other waste products in the blood, as occurs in [kidney](#)

**ureter:** an anatomical tube that drains urine from one of the two [kidneys](#) to the [bladder](#)

**urethra:** the tube that drains urine from the [bladder](#) through the prostate and out through the [penis](#)

**urge incontinence:** the need to urinate which is sudden and uncontrollable

**urinary system:** the group of organs and their interconnections that permits excess, filtered fluids to exit the body, including (in the male) the [kidneys](#), the [ureters](#), the [bladder](#), the [urethra](#) and the [penis](#)

**urinate:** to discharge urine, a fluid produced by the [kidneys](#)

**urodynamics:** The mechanical laws of fluid dynamics as they apply to urine transport

**urologist:** a doctor trained first as a surgeon who specializes in disorders of the [genitourinary system](#)

**uropathy:** a disorder involving the [urinary](#) tract

**UTI (urinary tract infection):** an infection identifiable by the presence of bacteria (or theoretically viruses) in the urine; may be associated with fever or a burning sensation on urination

## V

**vacuum erection device (VED):** a device that creates an erection with vacuum; it is usually a hard, plastic device placed over the [penis](#); a vacuum is then created by a pump, bringing blood into the penis

**vas deferens:** tube through which [sperm](#) travel from the [testes](#) to the prostate prior to ejaculation

**vascular:** relating to a blood vessel

**vasectomy:** operation to make a man sterile by cutting the [vas deferens](#), thus preventing passage of [sperm](#) from the [testes](#) to the prostate

**vasoconstrictor:** relating to a process, condition or substance that causes a narrowing of an opening of a blood vessel

**vasodilator:** a drug which cause blood vessels to expand, thereby increasing blood flow; vasodilators are used in Viagra® and other drugs (e.g., [trimix](#)) to cause erections

**vasomotor:** causing or regulating dilation or constriction of the blood vessels

**VEGF (vascular endothelial growth factor):** a substance known to stimulate blood vessel growth or [angiogenesis](#) and hence stimulate [tumor](#) growth

**Veil of Aphrodite:** a superficial membrane on the surface of the prostate critical for preservation of neurovascular bundle  
**venous:** of, relating to, or contained in the veins: e.g. *venous circulation*

**vesicle:** a small sac containing a biologically important fluid

**vessel:** a tube in which a body fluid circulates

**vinblastine (trade name Velban®):** periwinkle plant derivative used as an [antineoplastic](#) drug that disrupts cell division

**visceral:** relating to the internal organs of the body cavity

**virus:** ultramicroscopic infectious agent that replicates itself only within cells of living hosts; many are [pathogenic](#); a piece of nucleic acid ([DNA](#) or RNA) wrapped in a thin coat of [protein](#)

**voxels:** three-dimensional pixels (volumes) which display spectral data that consist of a series of peaks at distinct frequencies for different chemicals ([metabolites](#)) within tissue.

## W

**watchful waiting (WW):** active observation and regular monitoring of a patient without actual treatment; also called active objectified surveillance

**WBC:** white blood cell count; cells that are important to combating infection as well as being part of the immune system; comprised of granulocytes (neutrophils), lymphocytes and monocytes

**WBC/HPF:** white blood cells counted per high powered field during a microscopic evaluation

**WHITMORE-JEWETT staging:** see [staging](#)

**wortmannin:** a [lipid](#)-modifying [enzyme](#) that inhibits [PI3 kinase](#)

## X

**X-ray:** a type of high energy radiation that can be used at low levels to make images of the internal structures of the body and at high levels for [radiation therapy](#)

**xenograft:** a graft of tissue taken from a donor of one species and grafted into a recipient of another species

## Z

**Zoladex®:** trade or brand name for goserelin acetate, an [LHRH agonist](#)

**zone:** part or area of an organ

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