

Vermont Facts

- ❖ **Incidence:** Prostate cancer is the most commonly diagnosed cancer in men. Each year, approximately 500 prostate cancer cases are diagnosed among men in Vermont.
- ❖ **Mortality:** Prostate cancer is the second leading cause of cancer death in men. Each year, approximately 67 men die from prostate cancer in Vermont.
- ❖ **Trends:** Incidence and mortality for prostate cancer among Vermont men has not changed from 1997-2006. Incidence and mortality rates for prostate cancer have decreased among men in the U.S.
- ❖ **Age:** The incidence of prostate cancer increases with age. More than 59 percent of prostate cancer cases are diagnosed in men age 65 and older.
- ❖ **Vermont vs. U.S.:** Prostate cancer incidence and mortality rates among Vermont men are not different from the U.S.
- ❖ **Stage:** In Vermont, 83 percent of prostate cancers are diagnosed at the localized stage (the cancer is limited to the organ of origin), and 4 percent are diagnosed at the distant stage (the cancer has extended beyond the local organ or has metastasized).
- ❖ **Screening:** All men age 50 and older should discuss the pros and cons of prostate cancer screening with their physician before making a decision. Approximately 66 percent of Vermont men 50 and older had a PSA screening test in the preceding two years.

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Background

In Vermont, cancer is the second leading cause of death, with approximately 1,200 people dying from cancer each year. For the past 40 years, the three leading causes of death in Vermont have been heart disease, cancer, and stroke. In contrast to the dramatic declines in the death rates for heart disease and stroke, the death rate for cancer rose steadily over the past few decades before decreasing in recent years. Roughly one out of every two men and one out of every three women will develop cancer in their lifetime.

Any disease in which abnormal cells develop, divide, grow, and have the potential to spread throughout the body can be called cancer. If the spread of these cancer cells is not controlled, death may result. Cancer cells from a malignant tumor can invade nearby tissues either by direct growth into adjacent tissue or by migration through the bloodstream and lymphatic system to other parts of the body. This process is called metastasis. Cancer that started as prostate cancer and spread to the bone is still prostate cancer.

Prostate Cancer

Among men, prostate cancer is the most common form of cancer and the second leading cause of cancer death. According to the 2008 BRFSS, approximately four percent of Vermont adult males report ever having been diagnosed with prostate cancer. Nearly 6,000 Vermont men have been diagnosed with prostate cancer at some time during their lives.

The prostate is part of the male reproductive system and is a walnut sized gland that is located below the bladder and in front of the rectum. It contains cells that produce seminal fluid, which protects and nourishes sperm cells in semen. The prostate starts to develop before birth and continues to grow until adulthood. This growth is encouraged by male hormones, primarily testosterone. The prostate stays at adult size as long as male hormones are present. In older men, the inner part of the prostate (around the urethra) often keeps growing, leading to a common condition called benign prostatic hyperplasia (BPH). BPH is a benign growth of prostate cells where the prostate grows larger and presses on the urethra preventing the normal flow of urine. BPH can be a serious medical problem, however it is not cancer.

Cancer of the prostate is most often slow-growing, affecting men between the ages of 40 and 90. Prostate cancer may cause pain, difficulty in urinating, problems during sexual intercourse, or erectile dysfunction. Other symptoms can potentially develop during later stages of the disease. However, many men who develop prostate cancer never have symptoms, undergo no therapy, and eventually die of other causes.

Incidence

Defined as the number of *new* cases occurring in a population during a defined time interval, incidence rates are a useful measure of the risk of disease.

Table 1. The most commonly diagnosed cancers in males – Vermont, average number of cases per year, 2002-2006.

Male Cancer Site	Cases (per year)	Percent (per year)
Prostate	500	29%
Lung and Bronchus	252	15%
Colon and Rectum	162	9%
Bladder	135	7%
Melanoma (Skin)	106	6%
All Sites	1,732	100%

New cases per year exclude basal cell and squamous cell skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder.

- ❖ An average 1,732 cancers in men are diagnosed each year in Vermont. Of those, an average of 500 men are diagnosed with prostate cancer each year.
- ❖ Prostate cancer is the most commonly diagnosed cancer in males and accounts for roughly 29 percent of all cancers diagnosed in Vermont men.

Mortality

The mortality rate is a measure of the number of deaths in a population during a specific period of time.

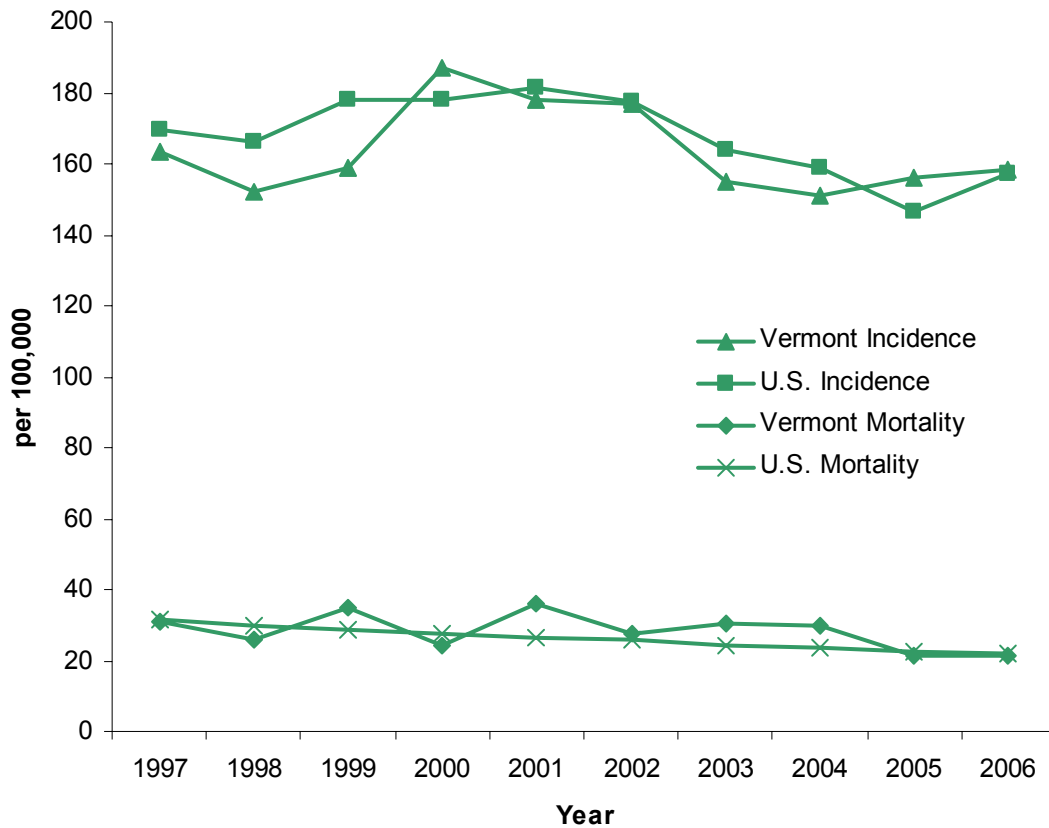
Table 2. The most common causes of cancer deaths in males – Vermont, average number of deaths per year, 2002-2006.

Male Cancer Site	Deaths (per year)	Percent (per year)
Lung and Bronchus	178	29%
Prostate	67	11%
Colon and Rectum	62	10%
Pancreas	32	5%
Leukemia	29	5%
All Sites	618	100%

- ❖ An average of 618 men die each year from cancer in Vermont. Of these, an average of 67 men die from prostate cancer.
- ❖ Prostate cancer is the second leading cause of cancer death among males in Vermont and accounts for roughly 11 percent of all cancer deaths in men.

Trends

Figure 1. Incidence and mortality rates of male prostate cancer – Vermont and United States¹, 1997-2006.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Vermont Incidence	163.2	152.3	158.9	187.3	177.9	176.9	155.1	151.2	156.1	158.1
U.S. Incidence	169.4	166.4	178.2	178.2	181.2	177.7	163.8	158.9	146.7	157.1
Vermont Mortality	31.2	25.8	35.1	24.2	35.9	27.4	30.7	29.9	21.6	21.3
U.S. Mortality	31.3	29.9	28.9	27.7	26.7	25.9	24.5	23.5	22.7	21.8

❖ From 1997 to 2006, the declines in the incidence and mortality of prostate cancer were statistically significant for the U.S.; the Vermont trends were not statistically significant.

¹ The U.S. rates represented in this publication are for whites. See Technical Notes section for more information.

U.S. Comparisons

Table 3. Incidence and mortality rates of prostate cancer – Vermont and United States, per 100,000, 2002-2006.

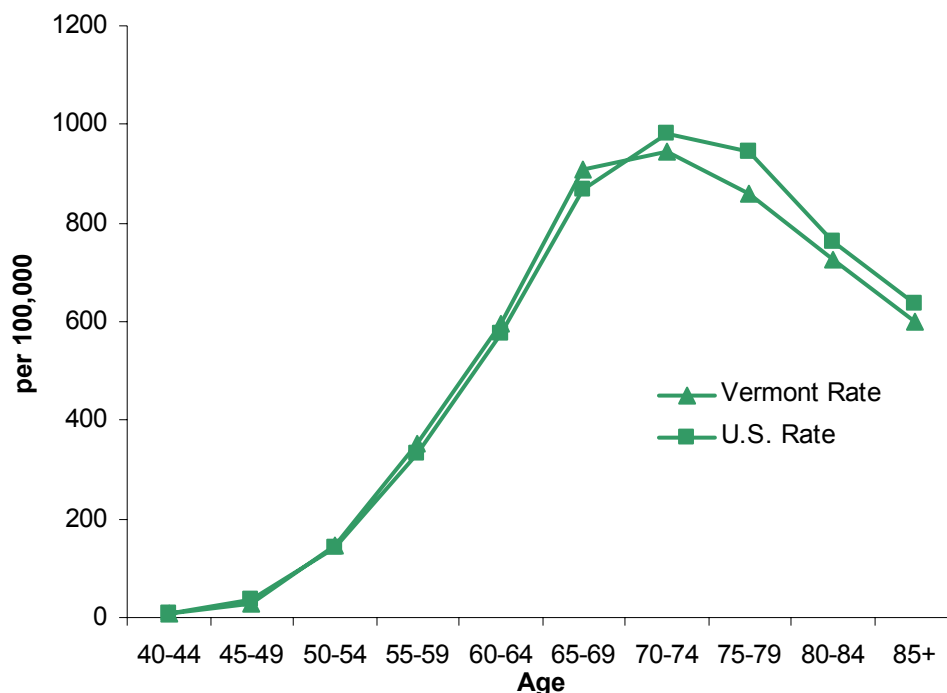
	Incidence	Mortality
Vermont males	158.8	26.1
U.S. males	160.6	23.6

- ❖ The prostate cancer incidence and mortality rates among Vermont males are not different from the U.S.

Age

The incidence of prostate cancer, as with many cancers, increases with age and is most often diagnosed among men over the age of 65.

Figure 2. Incidence rates of male prostate cancer, by age – Vermont and United States, 2002-2006.



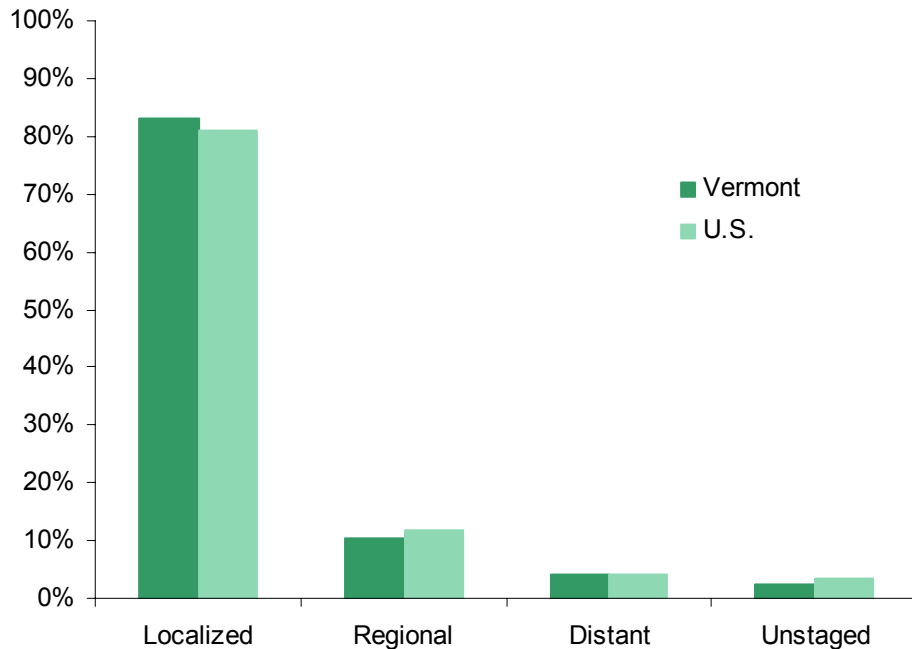
Age Group	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Vermont Rate	9.5	27.7	147.5	352.2	596.3	906.3	943.7	860.7	725.3	601.5
U.S. Rate	8.4	38.2	141.9	331.2	574.1	867.3	980.2	943.8	760.6	638.1

- ❖ Vermont males age 70-74 have the highest age-specific incidence of prostate cancer, at a rate of 943.7 per 100,000.
- ❖ There are no differences in age-specific incidence rates of prostate cancer between Vermont and U.S. males.

Stage at Diagnosis

Stage describes the extent to which the cancerous cells have spread from the original site to another part of the body; it helps determine prognosis and treatment options. Stage can be grouped into the following categories: in situ, localized, regional, distant, and unknown (unstaged). The earlier a cancer is diagnosed, the better a person's prognosis is likely to be. Cancers occurring in parts of the body that can be easily seen or felt (skin, breast) are easier to detect at an early stage (localized) compared to cancers of internal organs, which require imaging procedures and/or laboratory tests to detect.

Figure 3. Invasive male prostate cancer by stage at diagnosis – Vermont and the United States, 2002-2006.



- ❖ Among Vermont men, approximately 83 percent of prostate cancers are diagnosed at the early stage (localized), 10 percent are diagnosed at a regional stage, and 4 percent are diagnosed at a distant stage. In the U.S., 81 percent of prostate cancers are diagnosed at the early stage, 12 percent are diagnosed at a regional stage, and 4 percent are diagnosed at a distant stage.
- ❖ More Vermonters are diagnosed at a localized stage and fewer are diagnosed at a regional stage compared to the U.S.

Grade

The Gleason grading system provides very important information about the prognosis of men with prostate cancer. Together with other factors, it is part of a determination of prostate cancer staging, which predicts prognosis and helps guide treatment.

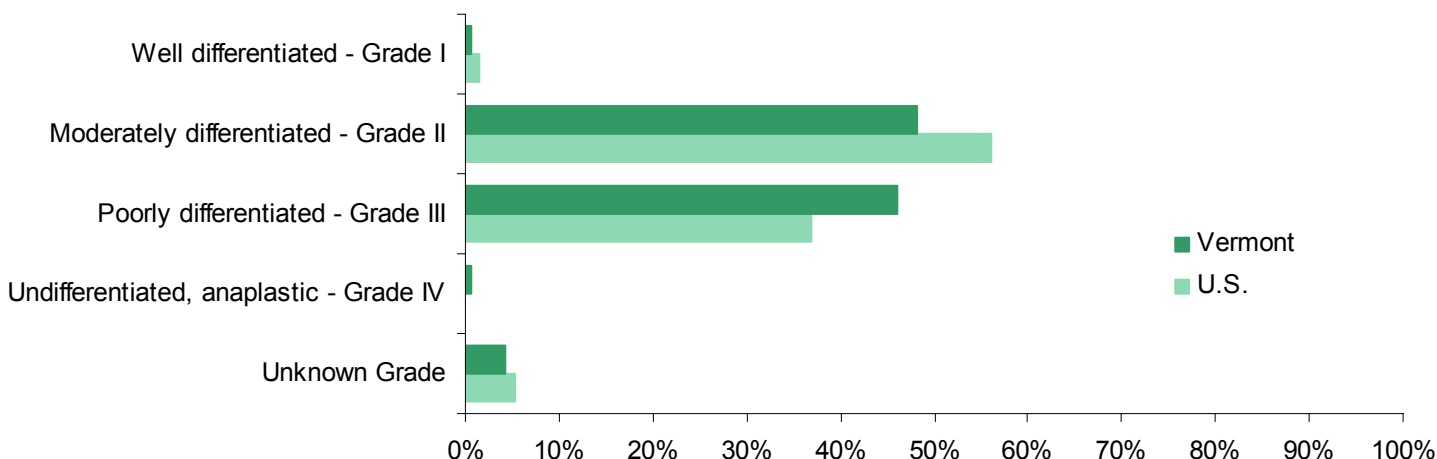
A Gleason score is given to prostate cancer based upon its appearance under a microscope. A pathologist assigns a grade to the most common tumor pattern and a second grade to the next most common tumor pattern. The two grades are added together to get a Gleason score. The Gleason grade ranges from 1 to 5, with 5 having the worst prognosis. The Gleason score ranges from 2 to 10, with 10 having the worst prognosis. It should be noted that for Gleason score 7, a Gleason 4+3 is a more aggressive cancer than a Gleason 3+4. Also, there is not really any difference between the aggressiveness of a Gleason score 9 or 10 tumor.

Cancers with a higher Gleason score are more aggressive, are more likely to spread, and have a worse prognosis. A cancer with a low Gleason score means the tissue is similar to normal prostate tissue and the tumor is less likely to spread.

Table 4. Description of Grade and Gleason Score².

Grade	Description	Gleason Score
I	Well differentiated (slight anaplasia)	2-4
II	Moderately differentiated (moderate anaplasia)	5-6
III - IV	Poorly differentiated or undifferentiated (marked anaplasia)	7-10
Unknown	Grade cannot be assessed	—

Figure 4. Invasive male prostate cancer by grade – Vermont and the United States, 2002-2006.



- ❖ Among Vermont men, approximately 0.7 percent of prostate cancers are Grade I, 48 percent are Grade II, 46 percent are Grade III, 0.7 percent are Grade IV, and 4 percent have an unknown Grade. In the U.S., 1.5 percent of prostate cancers are Grade I, 56 percent are Grade II, 37 percent are Grade III, 0.3 percent are Grade IV, and 5 percent have an unknown grade.
- ❖ Fewer Vermonters are diagnosed at a Grade I, Grade II or unknown grade compared to the U.S. More Vermonters are diagnosed at a Grade III and Grade IV compared to the U.S.

² These classifications were used for cases diagnosed prior to 2010. For information on current Gleason Score definitions refer to the *AJCC Cancer Staging Manual*, seventh edition or the Collaborative Stage website at: <http://www.cancerstaging.org/cstage/>.

Risk Factors

A risk factor is a condition, an activity or an exposure that increases a person's chance of developing cancer. Cancer develops gradually as a result of a complex mix of factors related to lifestyle choices, environment and genetics. Each type of cancer is caused by a different set of factors, some well established, some uncertain, and some unknown. The exact causes of prostate cancer are unknown, but some of the factors associated with an increased risk of developing prostate cancer are:

- ❖ **Age:** Most men with prostate cancer are over 65, and this cancer is rare in men under the age of 45.
- ❖ **Family history:** Risk is higher if a first-degree relative (such as a father, brother, or son) has prostate cancer.
- ❖ **Race:** Prostate cancer is more common among black men than men of other races. It is less common among Asian-American and Hispanic/Latino men than in non-Hispanic whites. The reasons for these racial and ethnic differences are not clear.
- ❖ **Certain prostate changes:** Men with cells called high-grade prostatic intraepithelial neoplasia (PIN) may be at increased risk of prostate cancer. PIN is a prostatic gland abnormality that is believed to precede the development of prostate adenocarcinoma (the most common form of prostate cancer).
- ❖ **Certain genome changes:** Researchers have found specific regions on certain chromosomes that are linked to the risk of prostate cancer. Other studies have shown an elevated risk of prostate cancer among men with changes in certain genes, such as BRCA1 and BRCA2.

Factors shown in research that do **not** appear to increase risk are: vasectomy surgery, tobacco or alcohol use, BPH (benign prostatic hyperplasia which is an enlargement of the prostate that is common in men over the age of 50), sexually transmitted disease, obesity, lack of exercise, or a diet high in animal fat or meat.

Screening and Prevention

Screening

Many cancers can be treated quickly and effectively if they are detected early. Screening is a way of checking for diseases when there are no symptoms. People of certain ages and genders are recommended to undergo screening tests, such as mammograms for breast cancer, Pap tests for cervical cancer, and colonoscopies for colorectal cancer.

Medical experts disagree on whether or not men should undergo regular screening for prostate cancer.

The Centers for Disease Control and Prevention (CDC) has developed a collection of educational materials intended to promote discussion between patients and physicians and to help men aged 50 to 74 years make informed decisions about prostate cancer screening. These materials are available at:

http://www.cdc.gov/cancer/prostate/informed_decision_making.htm.

For prostate cancer, there are two types of screening: the **prostate-specific antigen test (PSA)** and **digital rectal examination (DRE)**. The PSA is a blood test that measures the level of PSA protein in the blood sample. A high PSA level can be caused by prostate cancer, but it can, and most often is, caused by other conditions including: BPH, prostatitis (inflammation of the prostate), an infection, certain medications, or even some herbal supplements. In fact, only about one in four men who have a positive PSA test have prostate cancer.

The DRE, or digital rectal exam, involves a doctor inserting a gloved, lubricated finger into the rectum to feel the prostate for bumps, or other abnormalities. A DRE is a quick, safe, and easy test that checks for signs of prostate cancer as well as signs of rectal cancer. The DRE is sometimes done by itself or in combination with a PSA test.

Medical experts who *recommend* regular screening believe that finding and treating prostate cancer early, when treatment might be more effective, may save lives. This group recommends that all men with a life expectancy of 10 or more years should be offered the PSA test and a digital rectal exam (DRE) annually beginning at age 50.

Those who *do not recommend* regular screening believe that the evidence to date does not demonstrate that finding and treating early-stage prostate cancer saves lives. A recent study published in the *New England Journal of Medicine* in March 2009³ found that PSA screening does find more prostate cancers, but finding those cancers early does not reduce the risk of dying from the disease. Since prostate cancer tends to grow slowly, some men with prostate cancer never develop symptoms during their lifetime. Furthermore, the treatment for prostate cancer detected by screening can cause moderate-to-substantial harms, such as erectile dysfunction, urinary incontinence, bowel dysfunction, and death.

All Men age 50 and older should consider the pros and cons of prostate cancer screening and discuss options with a physician before making a decision.

Vermont has set a goal to promote informed decision-making about prostate cancer screening among Vermont men age 50 and over.

Approximately 66 percent of men 50 and older had a PSA in the preceding two years (BRFSS 2008). Data from the 2008 Behavioral Risk Factor Surveillance System indicate that some men are less likely to have had a PSA:

•**Lack of health insurance:** 47 percent of Vermont men 50 and older without health insurance report having

³ <http://content.nejm.org/content/vol360/issue13/index.dtl>

a PSA in the preceding two years compared to 67 percent of those with health insurance.

•**Without a personal doctor:** 29 percent of Vermont men 50 and older without a personal doctor report having a PSA in the preceding two years compared to 69 percent of those with a personal doctor.

Prevention

Currently, there is no known way to prevent prostate cancer, only ways to reduce a person's risk. Risk factors such as age, race, and family history cannot be controlled; however a man may reduce his risk for prostate cancer through changes in diet. Certain fruits and vegetables rich in lycopenes (including tomatoes, pink grapefruit, and watermelon) may help prevent damage to DNA and lower prostate cancer risk. Research is continuing to see if specific nutrients in food (i.e. vitamin E, selenium, and green tea extract) or some medications (i.e. Toremifene, an anti-estrogen) can lower prostate cancer risk.

Although it is not possible to prevent most cases of prostate cancer, the following actions can reduce a person's *overall* risk of developing cancer and help prevent other types of disease including heart disease and diabetes:

- avoid tobacco smoke.
- consume alcohol in moderation.
- maintain a healthful weight.
- balance caloric intake with physical activity.
- eat five or more servings of a variety of vegetables and fruits each day.
- choose whole grains in preference to processed grains and sugars.
- limit consumption of red meats, especially high-fat and processed meats. An exception to avoiding foods that are high-fat and that are linked to a higher risk of cancer and other health problems, are foods with omega-3 fatty acids, a type of fat found in cold-water fish such as salmon, herring and mackerel which appears to reduce the risk of certain cancers.
- use protection against harmful UV (sunlight) exposure.

Survival and Treatment

Survival refers to the percentage of people who are alive for a given period of time after diagnosis and is an indication of the prognosis of the disease. The prognosis and treatment of prostate cancer is largely determined by the stage of the disease which considers the size of the tumor, local involvement, lymph node status, and whether metastatic disease is present. Nationally, 95 percent of men diagnosed at a localized or regional stage survive their prostate cancers for at least five years. Only 3 percent of men diagnosed with distant stage prostate cancer survive for at least five years.

Treatment depends upon the stage and grade of the cancer and should also take into account age and expected life span, other health conditions, feelings (and your doctor's opinion) about the need to treat the cancer, the likelihood that a treatment will offer other benefits and feelings about the side effects common with each treatment. All treatments can have significant side-effects, such as erectile dysfunction and urinary incontinence. Treatment discussions often focus on balancing the goals of therapy with the risks of lifestyle alterations.

Prostate cancer can progress very slowly; for some men (particularly those who are older or have other serious health problems), the cancer may never require treatment. **Active surveillance** refers to observation and regular monitoring without invasive treatment. Active surveillance is often used when an early stage, slow-growing prostate cancer is suspected. This course may also be suggested when the risks of surgery, radiation therapy, or hormonal therapy outweigh possible benefits. Other treatments can be used if symptoms develop, or if there are signs that the cancer growth is accelerating such as a rapidly-rising PSA or an increase in a Gleason score from a repeat biopsy. Active surveillance avoids the risks of surgery, radiation, and other treatments. The risk of disease progression and metastasis (spread of the cancer) may be increased, but this risk appears to be small if the cancer is monitored closely, generally including serial PSA assessments (every 3 - 6 months) and repeat prostate biopsies every 1 - 2 years depending on the PSA trends.

There are several types of **surgery** for prostate cancer. Surgical removal of the prostate, prostatectomy or radical prostatectomy, is used most often if the cancer is not thought to have spread outside of the gland or when radiation therapy has been ineffective. Radical prostatectomy procedures remove the entire prostate gland as well as some of the tissue around it, including the seminal vesicles, either through an incision in the abdomen or through an incision in the perineum (the skin between the scrotum and anus). Radical prostatectomy can also be performed **laparoscopically**. Radical prostatectomy can be an effective treatment for tumors that have not spread beyond the prostate; however, the procedure may cause nerve damage resulting in complications such as loss of urinary control and impotence. Surgery offered when the cancer is not responding to radiation therapy can have additional risks. Radiation therapy causes tissue changes and prostatectomy after radiation has higher risks of complications.

Cryosurgery is another surgical method of treating prostate cancer in which the prostate gland is exposed to freezing temperatures. This procedure can be less invasive than radical prostatectomy. Using an ultrasound for visualization, metal rods are inserted through the skin of the perineum into the prostate. Highly-purified argon gas is used to cool the rods, freezing the surrounding tissue. As the water within the prostate cells freezes, the cells die. The urethra is protected from freezing by a catheter filled with warm liquid. Cryosurgery can cause fewer problems with urinary control than other treatments, but impotence results much of the time.

Radiation therapy can be used to treat all stages of prostate cancer. It can be employed after surgery if surgery was not successful at curing the cancer. Radiation therapy uses ionizing radiation to kill prostate cancer cells. Normal cells are able to repair radiation damage, while cancer cells are not. The two different types of radiation therapy used in prostate cancer treatment include **external beam radiation therapy** and **brachytherapy**. External beam radiation therapy uses a linear accelerator to produce high-energy x-rays that are directed in a beam towards the prostate. Brachytherapy involves using a needle to insert about 100 small "seeds" containing radioactive material through the skin of the perineum and into the tumor. The seeds emit lower-energy X-rays which are only able to travel a short distance. The seeds eventually become inert and remain in the prostate permanently.

Side-effects of radiation therapy may occur after a few weeks into treatment. In the short term, both types of radiation therapy may cause diarrhea and other bowel problems, mild rectal bleeding, as well as potential urinary incontinence and impotence. Symptoms can improve over time, except impotence, which can worsen over time.

Hormone therapy uses medications or surgery (orchiectomy, removal of the testicles) to block prostate cancer cells from getting dihydrotestosterone (DHT), a hormone produced in the prostate and required for the growth and spread of most prostate cancer cells. Blocking DHT often causes prostate cancer to stop growing and even shrink. Hormonal therapy typically does not cure prostate cancer, and cancers that initially respond to hormonal therapy can become resistant after a few years. This treatment is usually used when cancer has spread from the prostate. It may also be used along with radiation therapy or surgery to help prevent a return of the cancer.

Hormone therapy causes side effects such as impotence, hot flashes, and loss of sexual desire. Additionally, treatment that lowers hormone levels can weaken bones and increase the risk of bone fractures.

Chemotherapy is a treatment method that uses drugs to destroy cancer cells. If the cancer has spread beyond the prostate, chemotherapy may be offered to slow disease progression and postpone or relieve symptoms of metastatic disease to provide a better quality of life.

Clinical trials are generally designed to compare potentially better therapy with therapy that is currently accepted as standard and can be an important option for many individuals when considering treatment. Most of the progress made in identifying curative therapies for cancers has been achieved through clinical trials.

Information about ongoing clinical trials is available from the National Cancer Institute at:

<http://www.cancer.gov/clinicaltrials/search>.

Intervention, Policy, and Recommendations

Vermont Efforts

The Vermont State Cancer Plan⁴, published by the Vermont Department of Health and **Vermonters Taking Action Against Cancer (VTAAC)⁵**, provides a strategic roadmap to reduce the burden of all cancers by 2010. The Plan identifies strategic priorities in the following areas: preventing future cancers, detecting new cancers early, increasing access to optimal treatment and follow up, improving the quality of life for cancer survivors, and improving pain management and end-of-life care.

The burden of prostate cancer in Vermont can be reduced by achieving the following objectives, as identified in the 2006-2010 Vermont State Cancer Plan:

Detect new cancers as early as possible through appropriate screening:

- Promote informed decision-making about prostate cancer screening among Vermont men age 50 and over.

Increase access to high quality cancer treatment and follow-up care:

- Reduce financial, geographic and cultural barriers to appropriate cancer treatments.
- Increase referrals for multi-modality treatment assessment.
- Increase use of transportation services to access cancer treatment.
- Increase participation in clinical trials.
- Increase the percentage of Vermonters covered by insurance.

Improve the quality of life of Vermonters who are living with, through and beyond cancer.

- Improve emotional & psychological support for cancer survivors.
- Improve the general health of cancer survivors.

Improve end-of-life care for cancer patients through effective pain management and palliative care.

- Increase availability and use of pain management, hospice and palliative care.
- Promote reimbursement for hospice and palliative care among insurers.
- Increase number of Vermonters enrolled in the Vermont Advance Directive Registry.

Vermonters Taking Action Against Cancer (VTAAC) is a statewide collaborative partnership of over 200 organizations, healthcare providers and individuals working together to reduce the burden of cancer among all Vermonters. VTAAC workgroups and affiliate organizations develop and implement specific strategies and activities to achieve the objectives of the Vermont State Cancer Plan. Activities and progress towards these objectives are routinely assessed and reported annually. For more information about VTAAC, the Vermont State Cancer Plan or current activities and progress, visit: <http://healthvermont.gov/cancer> and <http://vtaac.org>.

The Vermont Cancer Survivor Network (VCSN) was founded in 2005 and is implementing the survivorship objectives in the Vermont State Cancer Plan. The Network is hosting celebratory events, providing educational activities for cancer survivors, their families and caregivers, and creating a peer-to-peer support network called Kindred Connections. For more information about VCSN, visit: <http://vcsn.net>.

⁴ Vermont State Cancer Plan, 2006-2010: http://healthvermont.gov/pubs/cancerpubs/state_cancer_plan.aspx.

⁵ A network of groups and individuals that speaks with one voice about reducing cancer risk, detecting cancers earlier, creating better access to quality cancer treatment, and improving the quality of life for cancer survivors. Visit <http://vtaac.org/> or call (802) 872-6303.

National Efforts

The American Cancer Society (ACS) has developed the Cancer Resource Network which provides free services to cancer patients and their caregivers. Services include: rides to treatment, lodging, referral to local community resources, emotional support, cancer education classes, and a 24-hour telephone information service. Other programs offered by ACS in select areas include:

- “Road to Recovery,” a free service offered by trained volunteer drivers providing transportation to and from their regular scheduled medical appointments.
- The “Man to Man” prostate cancer peer support groups operate in several communities in Vermont. This group helps men cope with prostate cancer by offering community-based education and support for patients and their family members. In addition, Man to Man plays an important role in community education about prostate cancer, encouraging men and health care professionals to actively consider screening for prostate cancer appropriate for each man's age and risk for the disease.

For more information, call 1-800-227-2345, or visit: www.cancer.org.

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed among Vermont residents as well as out of state residents who are diagnosed or treated in Vermont. The registry enables the state to collect information on new cases (incidence) of cancer since January 1, 1994. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Vermont Department of Health Cancer Registry, 1997-2006. The Vermont Cancer Registry can be contacted at 802-865-7749 (http://healthvermont.gov/research/cancer_registry/registry.aspx).

Vermont Vital Statistics: In Vermont, all deaths are registered using an Electronic Death Registration System which is maintained by the Vermont Department of Health (VDH), Vital Statistics. Certificates are available from towns with appropriate jurisdiction or the VDH Vital Records Office. Vital Statistics Bulletins are posted at: <http://healthvermont.gov/research/index.aspx#vital>.

Behavioral Risk Factor Surveillance System: Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested Citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.

Surveillance, Epidemiology, and End Results: The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2006, National Cancer Institute. Bethesda, MD, 2008 (http://www.seer.cancer.gov/csr/1975_2006).

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates represented in this report are for the U.S. white population. Suggested Citation: Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Public-Use With State, Total U.S. (1969-2006), National Cancer Institute, DCCPS, Surveillance Research Program, Cancer Statistics Branch, released April 2008. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Technical Notes and Definitions

Age Adjustment: All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

Incidence: Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new prostate cancer cases diagnosed in the state during one year divided by the number of residents in the state during the same year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Prostate cancer cases were defined as invasive neoplasms with ICD-O-3 histology code C61.9 with the exception of histology 9590-9989 (or equivalent for older data).

Mortality: Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases (ICD). Cause of death was coded according to ICD-10. Cause of death before 1999 was coded according to ICD-9. Comparability ratios were applied to pre-1999 mortality rates to allow for continuity in trends across the ICD revisions.

Race: U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.9 percent of the total Vermont population, compared with the total U.S. non-white population of 34 percent in 2007. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents

of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

Statistical Significance: The use of the terms “higher” and “lower” in this document refer to a “statistically significant” difference. A statistically significant difference indicates that there is statistical evidence that there is a difference that is unlikely to have occurred by chance alone.

Small Numbers: Rates are not presented in this report if they are based on fewer than 6 cases.

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