

### *What refinements have occurred with PSA testing?*

Over the past several years, one of the refinements in PSA has been the free to total PSA ratio. Essentially, PSA comes in 2 forms, a “free” form in which the PSA circulates in the blood unbound to any other structures, as well as a “complex” PSA in which the PSA is bound to a protein. These two forms of PSA, free and complex, are somewhat similar to the different forms of cholesterol that are present circulating in the blood, and like the HDL/total cholesterol ratio, the Free PSA/ Total PSA ratio can offer a predictive value. It has been found that in men with an elevated PSA, the free to total PSA ratio can enhance the specificity of PSA testing for the diagnosis of cancer. In general, the higher the ratio of free to total PSA, the greater the probability that benign enlargement of the prostate is the underlying source of the PSA elevation. In men with PSA between 4.0 and 10.0, the probability of cancer is only 8% if the free PSA ratio is greater than 25%. However, the probability of cancer increases to 56% if the free PSA ratio is between 0 and 10%.

Free PSA/Total PSA	% Probability of Cancer
> 25%	0 – 10%
20 – 25%	16%
15 – 20%	20%
10 – 15%	28%
0 – 10%	56%

### *What tests are obtained if the PSA is elevated?*

If the rectal exam indicates any abnormal findings, or if the PSA is elevated, or the PSA velocity is accelerated, the next diagnostic step is an ultrasound of the prostate and biopsies of any abnormal areas seen on the ultrasound. Thanks to the development of transrectal ultrasound, biopsies of the prostate are now more accurate and less uncomfortable. The ultrasound device bounces high-frequency sound waves into the prostate so that different densities between normal prostate tissue and cancer appear as shadows on the ultrasound image. The images allow the physician to guide a spring-loaded device that sends a needle through the wall of the rectum into the prostate to capture tiny pieces of tissue. A pathologist can then microscopically examine the tissue to determine if it is cancerous. All of these tests are available as office procedures in a comfortable outpatient setting at Bergen Urological Associates.

### *In patients already diagnosed with prostate cancer, is PSA testing useful?*

Monitoring PSA is extremely helpful in evaluating the effectiveness of surgery or other therapies for prostate cancer. Typically, the level of PSA decreases in response to effective treatment. Failure of PSA levels to return to normal after surgery or other therapies is suggestive of the presence of residual tumor. Studies have shown that a cancer recurrence can be demonstrated by an increase in PSA even before it is able to be picked up clinically. In summary, PSA is a readily available and simple blood test that, in conjunction with a digital rectal examination, is very helpful in detecting prostate cancer. This test can be obtained in the office at Bergen Urological Associates and the results are generally available with 2-3 days.

# **P.S.A. Prostate Specific Antigen: Blood test to detect Prostate Cancer**

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## Why is a PSA test so important?

The PSA test measures levels of Prostate Specific Antigen (PSA) in the blood and is one of the best tools currently available for detecting prostate cancer in its earliest – and most curable – stages. Prostate cancer is one of the most common cancers found in men in the United States. Every 94 seconds, an American man is diagnosed with prostate cancer. It occurs in approximately one out of ten men during their lifetime. Prostate cancer is more common in older men and is the second leading cause of cancer death in American men. Early prostate cancer causes no symptoms whatsoever; only advanced prostate cancer give rise to pain and other symptoms. A PSA test is one of the best ways for a doctor to obtain a “snapshot” picture of a man’s prostate health. In the past, a digital rectal exam was the most reliable means of detecting early prostate cancer. This PSA test, in combination with a rectal exam, provides a better method of detecting prostate cancer than rectal exams alone.

## What exactly is PSA?

PSA is a type of protein that is produced by the prostate gland and can be measured in a man’s bloodstream. Since prostate cancer cells overproduce this protein, this oftentimes causes an elevation of PSA in the blood. PSA has been shown to be one of the most useful indicators of tumor growth in the prostate gland. Screening with a PSA blood test provides important information that can be used as an aid in the early detection of prostate cancer as well as other diseases of the prostate. Prompt detection of prostate cancer helps provide for better treatment and a greater potential for cure.

## What other conditions may cause a high PSA level?

There are several conditions other than prostate cancer that can cause the level of PSA in the bloodstream to rise. The one most often encountered is enlargement of the prostate gland, called *Benign Prostatic Hypertrophy* (BPH). The most common symptoms of this condition are difficulty emptying the bladder during urination and the need for more frequent urination. Both of these complaints are common among men over 50. Approximately four out of every five men will eventually develop an enlarged prostate gland. It is important to note that BPH is NOT cancer, nor is there any evidence that it leads to cancer.

Other conditions can also cause an increase in the level of PSA, including urinary tract infection or inflammation of the prostate called *prostatitis*. Since the test cannot distinguish between rises in PSA due to cancer and those related to other conditions, it is always recommended that test results be discussed with a health care professional.

## Who should take the PSA blood test?

The following guidelines are recommended:

All men, age 40 and over, should have an annual prostate screening comprised of a PSA test and a digital rectal examination (DRE).

## What is considered an elevated PSA?

A PSA level above 4.0 is considered abnormal. Prostate cancer, an enlarged prostate or an acute bacterial inflammation can cause the PSA to be greater than 4.0. Certain men may have higher-than-normal PSA levels without any identifiable reasons – some experts attribute this simply to “leaky” prostates.

The 4.0 cutoff for what is considered an abnormal PSA is an average for all ages. The PSA will usually increase with the aging process due to “normal” prostate enlargement. Age specific reference ranges for PSA have thus been established:

Age (year)	PSA Upper Limit (ng/mL)	Age (year)	PSA Upper Limit (ng/mL)
40	2.0	60	3.8
41	2.1	61	4.0
42	2.2	62	4.1
43	2.3	63	4.2
44	2.3	64	4.4
45	2.4	65	4.5
46	2.5	66	4.6
47	2.6	67	4.7
48	2.6	68	4.9
49	2.7	69	5.1
50	2.8	70	5.3
51	2.9	71	5.4
52	3.0	72	5.6
53	3.1	73	5.8
54	3.2	74	6.0
55	3.3	75	6.2
56	3.4	76	6.4
57	3.5	77	6.6
58	3.6	78	6.8
59	3.7	79	7.0

It is very useful to compare the PSA values from year to year. Generally, the PSA will increase by only a small increment, reflecting the gradual increase in prostate growth. If the PSA accelerates at a greater rate than anticipated, a condition known as *accelerated PSA velocity*, an ultrasound/biopsy is indicated.