



The Prostate: Review Practical Considerations for Male Pilots

Although there is no direct air safety risk related to prostate conditions, pilots should not ignore the potential health risks. Studies show that prostate cancer can occur in early middle age and its prevalence increases with age.

by
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A blood test that detects prostatic cancer in its early stages has saved thousands of lives since it was first employed in 1979.¹ Male pilots, especially those more than 50 years old, should discuss this test with their physician.

The test, called prostate-specific antigen (PSA), is extremely effective in detecting prostatic cancer and is becoming increasingly available throughout the world. A major study indicated that PSA detected prostatic cancer in 95 percent of men who were unaware that the cancer existed.²

In one series of autopsies, 30 percent of men 50 years old and older were found to have had prostatic cancer, a condition that, although not a flight safety hazard for pilots, is nevertheless an issue in long-term pilot health.³

Prostatic cancer can be especially dangerous if the cancer spreads to other parts of the body.

The prostate gland is a component of the male reproductive system and responds to the male sex hormone, testosterone, and its chemical analogs. The gland provides the bulk of the fluid that carries sperm during ejaculation.

Benign prostatic hypertrophy (BPH) is not uncommon in middle-aged males and is found in more than half of all men as they grow older. The symptoms of BPH are mainly associated with a weakening of the urinary stream and an incomplete emptying of the bladder.

Prostatitis is a condition in which the prostate gland becomes inflamed through infection or bruising (some

long-distance bicycle riders, for example, have experienced this condition). Discomfort in the prostate area may be felt, along with experiences of a sudden urgency to urinate. Occasionally, loss of control of urinary function is a major symptom.

Cancerous growth of prostate cells can start in early middle age. The cancer may result in no symptoms, or may begin producing the symptoms of BPH or prostatitis, both of which may or may not be associated with the cancer. About half of the cases of prostate cancer can be detected by digital rectal examination as a nodule or as an asymmetrical lobe of the prostate. If detected early, proper treatment can prevent spread of the cancer beyond the prostate.

Although there is no aviation medical standard relating directly to the prostate, and there is no air safety risk of sudden incapacitation related to prostate conditions, pilots should not ignore this health factor. Many men may never face prostatic disease, and many will never have any difficulties or symptoms relating to their prostate gland. However, others (even men of a relatively young age) can experience metastatic spread of a prostate cancer that gives no heralding symptoms.

Still other men may have some urinary symptoms from time to time due to prostatitis or prostate enlargement, but will not contract prostatic cancer and will never require treatment. Accordingly, an awareness among pilots of prostatic symptoms that require attention, as well as periodic PSA screening tests, will increase the likelihood of detecting serious problems early.

Because the prostate gland is wrapped around the urethra (the duct through the penis) and located adjacent to the bladder neck, prostatic diseased tissue can press on the urethra and cause urination symptoms. A weakened urinary stream is a common symptom. A need to urinate every hour or so may also be caused by generalized prostatic enlargement, prostatitis, or in some cases, localized prostate enlargement near the urinary tract (a prostatic cancer nodule can cause this). The sudden urge to urinate, with a loss of control of urination, may result from these conditions. Laboratory urine tests may show excess blood in the urine.

Microscopic examination of the urine may also show white blood cells and/or red blood cells. It is possible that enough blood may be in the urine to give it a reddish or darkened color. Incomplete emptying of the bladder may result in several arousals from sleep at night due to the need to urinate. Prostatitis may cause tenderness and

discomfort in the area of the prostate, and fever may accompany the prostate inflammation.

The gloved digital (finger) rectal examination to determine the prostate's condition is a painless, although sometimes uncomfortable, procedure that requires about 30 seconds. The normal prostate will be about the size of a chestnut and will have a right and left lobe with a centrally located groove between the lobes.

Through practice, the examining physician will be able to feel if the right and left lobes are of the same approximate size and if the prostate is enlarged. In addition, the physician can determine if any hard nodules are present. The normal prostate should have a certain texture that can be recognized by the physician, and any regions that feel softer than normal are noted. These regions may indicate prostatitis. A hard nodule may indicate a growing cancer.

PSA blood test results compared with the possibility of prostatic cancer are shown in Table 1 (page 3). If elevated above 9.9 units, the PSA test is highly suggestive of prostatic cancer. It is also possible for BPH and/or prostatitis to cause an elevation in PSA levels. Ultrasound and biopsy diagnostic procedures are then indicated.

Prostatic acid phosphatase (PAP) is a blood enzyme that offers additional evidence of the presence of prostatic cancer. Levels above four units are highly suggestive of the presence of cancer and call for further specific tests. Today, PAP tests are always made in conjunction with PSA tests.

A technique that gained widespread use during the 1980s is ultrasound scanning of the prostate. A probe approximately 3/4 inch (1.90 cm) in diameter is placed within the rectum over the prostate and, with ultrasound energy (there is no ionizing radiation), a scanning image is produced on a cathode-ray tube of the right and left sides of the prostate. Areas of the prostate that contain cancer will often appear less dense in the scan than normal prostate tissue. This technique allows a more accurate pinpointing of possible cancer locations and can locate some cancers that are not revealed by digital examination. Ultrasound is also used to aid in guiding a biopsy instrument, thus increasing the certainty that the biopsy will be taken from the area of potential cancer.

Urologists have developed a biopsy instrument that can obtain a tissue sample in a fraction of a second for microscopic examination. Three to four biopsies often are made on each side of the prostate. An antibiotic is

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taken usually before the procedure to provide protection for the rare infection that might occur following the procedures.

Prostate biopsies are relatively simple outpatient procedures and are the best approach to diagnosis. Tissues from the biopsy are examined by pathologists using microscopy. Inflamed prostate tissue can be differentiated from BPH tissue. Cancerous tissue can be determined as "in situ" and well "encapsulated," a condition that with surgery usually leads to a complete cure. In addition, cancerous tissue that is invading within the prostate can be diagnosed, as can those prostatic cancers that are spreading beyond the prostate capsule itself. However, the greater the invasion and spread of the cancer, the greater the threat to the long-term survival of the patient. Pathologists have assigned microscopic stages to the various degrees of cellular severity of prostate cancer (stages one, two and three). In stage three, cellular severity is greatest.

A number of treatment approaches are available for the person with prostate problems. BPH, for example, can be treated by specific subtotal prostatectomy procedures. Surgical approaches to remove parts of the prostate can be made through the urethra, from the front above the pelvic bone, or through the area beneath the scrotum. Methods are available whereby these procedures (including the procedure that removes the entire prostate) avoid cutting nerves that are necessary for urinary and erectile functions.

If cancer is present and has spread beyond the prostate, certain lymph gland dissections are possible. If cancer has spread to the skeleton or to other parts of the body distant from the prostate, radiation treatment and chemotherapy may be warranted. In addition, male hormone secreting cells may be removed to diminish the stimulatory effects of testosterone on prostatic tissue. Estrogenic (female) hormones have been used to further diminish the growth of cancer cells. Some medical facilities have used radioactive gold implants at cancer tissue sites in the prostate, an approach that avoids surgical procedures.

A new drug, Proscar, has also been approved by the U.S. Food and Drug Administration. Proscar (known generically as finasteride) may preclude surgery for BPH for some patients. The drug has been found to reduce the prostate's size and diminish symptoms in approximately 40 percent of those treated.

There are no known practical measures to prevent development of either BPH or prostatic cancer. The same may be said of prostatitis, a disease that can occur at virtually any adult age. Some prostatitis may be related to certain venereal diseases. There is also evidence that certain sports place undue stress on the prostate gland, bruising it and increasing susceptibility to inflammation and infection.

Table 1
PSA Blood Test Results

Serum PSA Value (micrograms/liter or nanograms/milliliter)	Percentage then biopsied and diagnosed with prostate cancer
4.0 to 9.9	22
Greater than 9.9	67

Source: Adapted from studies by Catalona.⁴

Those sports that involve considerable stretching through the pelvic area where muscle and ligament pressures on the prostate might tend to bruise prostatic tissue.

For those with the symptoms of urgency of urination, and/or incomplete emptying of the bladder, some advance planning on trips will be necessary, including taking advantage of every reasonable opportunity to urinate, especially immediately preceding flight departure. This is even more important if no toilet facilities are available on the aircraft. Avoiding excessive hydration in the hours prior to flight will help, as will avoidance of beverages containing caffeine. Caffeine promotes rapid kidney secretion of urine.

Pilots should consult a physician if urinary symptoms occur and, starting in late middle age, should have periodic examinations and blood screening for possible prostatic cancer development. ♦

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HUMAN FACTORS & AVIATION MEDICINE

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