Heinonen believes the differences in rates do not signal as large a biological difference as a statistical one. “Finland became affluent much later than the United States,” he said, “and by and large prostate cancer is like colon cancer — the more affluent the country, the more cases you have” — meaning the rates in Finland will soon be closer to U.S. rates.

What the Finns do not have is a high rate of prostate-specific antigen screening, as is common in the United States, and which has been implicated as an important factor in the increased detection of prostate cancer here.

Possible Downside
And vitamin E was not without possible downsides in the ATBC Study. Although men taking the supplement had fewer deaths from ischemic heart disease and ischemic stroke, they had more hemorrhagic strokes, primarily in men with underlying hypertension. The overall stroke rate between the two study groups was not statistically different.

Researchers cannot transfer these results to the general population because hemorrhagic strokes were a small proportion of the total cause of death in the ATBC Study and because smokers are at greater risk of stroke already.

Any planned follow-up trial would have to take those and other disease outcomes into account. Specifics about the possible NCI study are far from determined beyond the possible inclusion of selenium supplementation. In a study of skin cancer patients reported in the December 1996 issue of the Journal of the American Medical Association, selenium supplements seemed to reduce the incidence of prostate cancer by 63% but not that of the basal or squamous cell skin cancers targeted.

— Kara Smigel

Using Lasers and Light-Activated Drugs, Researchers Home in on Early Lung Cancers

Photodynamic therapy (PDT) — the use of lasers and light-activated drugs to kill tumors — now may be used to treat some lung cancer patients diagnosed at an early, presymptomatic stage of the disease.

In January, the U.S. Food and Drug Administration approved the use of Photofrin (porfimer sodium) in PDT for patients with microinvasive lung cancer who are not eligible for surgery or radiotherapy.

Photofrin is already approved in the United States for palliative treatment of certain cancers (see News, Jan. 15, 1997), but this is the first approval of PDT in North America for a potentially curative use. It was previously approved for early stage lung cancer treatment in Japan and Germany.

One group of patients who stand to benefit is those who have been successfully treated in the past for lung cancer or head and neck cancer, or who have a recurrence but cannot have radiotherapy or surgery safely again.

“These patients are at a point where there’s not a lot to be done for them — that’s why this is a significant improvement,” said Thomas J. Dougherty, Ph.D., chief of the Department of Radiation Biology/Photodynamic Therapy at Roswell Park Cancer Institute in Buffalo, N.Y. “It’s a relatively innocuous way to treat them. It causes minimal damage to normal tissue.”

Roswell Park holds the patent on Photofrin, which is manufactured by QLT Phototherapeutics in Vancouver, British Columbia.

Photofrin is injected intravenously, and concentrates in tumor cells. The drug is then activated by laser light delivered to the tumor through a fiber-optic endoscope, producing a toxic form of oxygen that destroys cancer cells. Necrotic tissue is removed later through the bronchoscope.

Another Option
The most serious side effect of Photofrin is photosensitivity of the skin; patients must stay out of the sun and other bright light for 4 to 6 weeks.

Even patients without a history of lung or head and neck cancer who are diagnosed with early stage lung cancer, Dougherty said, may have cardiac problems — even emphysema — “and they are just not good candidates for surgery or radiotherapy.”

In the past, he added, “these patients did not have a lot of options — now they have another option.”

In clinical trials carried out in Vancouver and in Europe, about three quarters of the patients had a complete response following treatment and about half are cancer-free in long-term follow-up — in some cases as long as 10 years, said Stephen Lam, M.D., head of the...
bronchoscopy program at the British Columbia Cancer Agency of Vancouver. The other participating centers are in France, Germany, and the Netherlands.

In Lam's approach, patients are first screened using sputum cytology (see News, Dec. 17, 1997). If abnormal cells are detected, the patient then has a fluorescent bronchoscopy and a biopsy to pinpoint the tumor’s location and confirm that it has not already become widely invasive.

**Measuring Fluorescence**

A new bronchoscope invented by Lam and colleagues uses blue light, which induces tissue to fluoresce weakly, Lam explained. Cancerous tissue fluoresces slightly less than normal tissue, a difference the Vancouver scientists exploited by designing a special camera — approved by FDA in 1996 — that picks up this subtle contrast to localize the lesion. The device is called Life-Lung and is made by Xillix Technologies of Richmond, B.C.

Roswell Park is planning a trial of early detection using sputum cytology and the fluorescent bronchoscope in patients previously treated for lung or head and neck cancer. Patients discovered to have new lung cancers will be treated with PDT or other modalities depending on what is most appropriate for each.

“I predict that in coming years more microinvasive cancer will be found and will be treatable with photodynamic therapy,” Lam said.

Meanwhile, researchers at the Mayo Clinic in Rochester, Minn., and Jacksonville, Fla., are testing PDT for another group of early stage lung cancer patients, who have squamous-cell lung cancers that have not penetrated the bronchial wall. Surgery is the usual treatment for these patients, but it carries the risk of complications such as loss of pulmonary function when substantial sections of lung are removed.

“Our hypothesis was that photodynamic therapy could reduce the risk of surgery, preserve lung tissue, and decrease costs without sacrificing therapeutic effectiveness,” said Denis A. Cortese, M.D., of Mayo Jacksonville. “Our goal was to evaluate the effectiveness of photodynamic therapy by determining how many patients could ultimately be spared surgery.”

In an article published in the July 1997 *Mayo Clinic Proceedings*, Cortese and colleagues reported that nine of 21 patients were treated successfully with PDT and spared surgery, with 2 to 10 years of follow-up.

A similar trial on PDT as an alternative to surgery is being conducted in Japan, and interim analysis “lends further support to the concept that PDT is an effective alternative to surgical resection,” Harubumi Kato, M.D., Ph.D., of Tokyo Medical College wrote in an editorial on the Cortese study.

In an earlier study, Kato and his colleagues found that PDT is more cost-effective than surgery for early stage lung cancer. The total cost per surgically treated patient was $14,948, while the cost per patient treated with PDT was $8,475.

— Tom Reynolds

**Infections and Cancer: Viruses Are Still Prime Suspects**

If a mouse can get breast cancer from a tumor virus, can this happen in humans, too?

This is an old question, but at the 8th International Congress on Anti-Cancer Treatment in Paris, James Holland, M.D., distinguished professor of neoplastic diseases at Mount Sinai Medical Center in New York, thinks he is closer to the answer with his discovery of a “cousin” to the mouse mammary tumor virus in human breast cancers. Sequences of the virus, which he calls the Human Mammary Tumor Virus (HMTV), were found in more than a third (37%) of a series of 387 fresh or frozen breast cancer tissues.

When it comes to breast cancer, the finger of suspicion is also cast on the Epstein-Barr virus, according to studies reported by Beverly Griffen, Ph.D., D.Sc., of the Department of Infectious Diseases at the Imperial College School of Medicine at Hammersmith Hospital in London. Examination of several hundred breast cancers from patients in Europe and Africa found EBV in anywhere from 20% to 46% of the specimens in geographic subgroups.

Whether or not additional investigations confirm that HMTV, EBV, or any other virus is indeed implicated as a