

# PREVENTING POST-BIOPSY INFECTIONS

Doctors are trying new techniques to reduce the incidence of infection in men who undergo a prostate biopsy to check for cancer, a problem that affects about 1 in every 20 patients

By Markian Hawryluk  
WesCom News Service

Every year, more than 1 million men in the United States undergo a prostate biopsy to check for cancer, but one in 20 will develop an infection in the process. Doctors typically prescribe antibiotics to prevent that, but infection rates have been climbing for more than a decade.

That's led to a host of new strategies and techniques aimed at preventing infection or reducing the need for antibiotics.

"Whenever something bad happens to a patient, it hits me particularly hard," said Dr. Matthew Simmons, a urologist with Bend-based Urology Specialists of Oregon, who published his strategy in a prominent urology journal last year. "I just got sick of seeing it."

In a standard biopsy, doctors use ultrasound imaging to guide a needle through the rectum and into the prostate gland, taking about a dozen tissue samples to check for cancer. The rectum, however, is full of bacteria, which can hitch a ride on the needle and make its way into the prostate, the bladder or the bloodstream.

*"Now, we're up to 481 consecutive biopsies without an infection."*

— Dr. Matthew Simmons, urologist at Urology Specialists of Oregon

According to the American Urological Association, 5 to 7 percent of men undergoing prostate biopsy will develop an infection, and 1 to 3 percent will need to be hospitalized at an average cost of \$4,000 to \$5,000. In rare cases, it can lead to bloodstream infection known as sepsis that can be fatal.

Typically, doctors have prescribed antibiotics from a category known as fluoroquinolones, that include the drug ciprofloxacin, sold under the brand name Cipro. But one in five men harbor bacteria that is resistant to that group of antibiotics, which increases their risk for a post-biopsy infection four-fold. That has led to an increase in the infection rate.

Researchers from Weill Cornell Medical Colleges reported in 2016 that infection rates within 30 days of prostate biopsy in New York increased from 2.6 percent in 2011 to 3.5 percent in 2014.

"Antibiotics are widely used in the food supply in this country. There's overprescribing of antibiotics for upper respiratory infections and other conditions," said Dr. Stacy Loeb, a urologist with New York University's Langone Health in New York City. "There's just a great prevalence of antibiotic resistance, which has very little to do with prostate biopsy per se."

Loeb said urologists are trying to screen patients for infection risk factors, including things like uncontrolled diabetes, exposure to antibiotics, recent international travel or hospitalization. Patients at higher risk can be given additional antibiotics. In some cases, doctors will perform a rectal swab a few days before the biopsy to check for resistant bacteria. Studies have shown those approaches haven't been that effective in preventing infections.

Simmons and his colleagues developed a protocol that includes a different combination of antibiotics, as well as disinfecting the biopsy needle with alcohol after each sample is taken. The change in antibiotics reduced the clinic's infection rate from about 4 percent to 2 percent.



Ryan Brennecke / WesCom News Service

Dr. Matthew Simmons demonstrates how he cleans a biopsy needle in a small container of isopropyl alcohol at Urology Specialists of Oregon. It has been shown that there is a significant reduction of sepsis by using a combination of antibiotics and isopropyl alcohol needle washing when performing a prostate biopsy.

Adding the needle washing component drove the infection rate down to zero.

"Now, we're up to 481 consecutive biopsies without an infection," Simmons said. "It's one of those things that works for us, but you have to wait for other centers to try it and publish their data to determine whether it's real."

Other researchers have tried needle cleaning with formaldehyde or iodine, or wiping down the needle with an alcohol sponge, with mixed results. Simmons believes his technique might be more effective because he doesn't just clean the exterior of the needle.

"I think the inside of the needle is where all the junk is trapped," he said, "and every time you fire that needle into the prostate, you're basically inoculating that person with the stuff that's inside the needle."

Other doctors have advocated for avoiding the rectal approach and going through the perineum, the area between the rectum and the scrotum. The transperineal approach has infection rates close to zero, but has other disadvantages. For one, that technique is generally done

in an operating room or surgery centers under anesthesia, which brings added costs and risks. It's also a trickier procedure to pull off, raising the question of whether it is as good as finding cancer as the traditional approach.

"In experienced hands, transperineal does an equal job of detecting cancer as transrectal, but a lot of urologists haven't been trained that way," said Dr. Sudhir Isharwal, an assistant professor of urology at Oregon Health & Science University. "It has been gaining traction, especially for patients who need repeated biopsies."

New recommendations on prostate cancer screening in 2012 have led to a 20 percent reduction in diagnostic biopsies in the U.S. and Canada. Some of the decline, however, has been offset by an increase in active surveillance of low-risk prostate cancer, which often relies on repeated biopsies. Doctors are working on ways to reduce the need for biopsies, especially repeated biopsies, with more advanced testing and MRI imaging.

Patients diagnosed with prostate cancer who choose active surveillance rather than surgery or radiation

once routinely got biopsies every one or two years. Now, patients at OHSU follow-up with an MRI after a year, and if the lesion hasn't changed, will shift to a two-to four-year interval between biopsies.

MRI imaging has also allowed doctors to reduce the number of samples taken per biopsy.

"We used to take 24 cores, 18 cores," Isharwal said. "Now with MRI, we can take only three cores from the target and find equivalent cancer detection."

Loeb said efforts to reduce biopsies are probably the main area of research in the field now. Doctors used to rely on PSA blood tests to determine whether a patient might have prostate cancer and whether to do a biopsy.

Better tests limit the false alarms. Combined with better imaging and risk stratification, doctors can feel more confident about the patient's cancer risk without getting a prostate tissue sample and putting the patient at risk of an infection.

"The hope is to reduce the total number of biopsies being done in the first place," she said.

## PINES

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If the sunlit savanna — roomy enough to drive a wagon through with ease — is the defining arrangement of ponderosa pine, the lodgepole's is the "doghair" wood: a stand of spindly trees so tight-packed it's difficult to walk through (with wagons completely off the table), often developing after a big burn. Skinny as doghair pines are, they may be a century old, their growth slowed by the crushingly close quarters.

### Whitebark pine

Our next pine is a tree of sky and rock: one you'll find scattered in the upper belt of subalpine forest, but which prefers the storm- and sun-battered barrens above. The last tree yielding to crag, cloud, and snowfield in our mountains — pioneering past 9,000 feet — is the whitebark pine, sole North American representative of that special soft-pine clan the "stone pines." These otherwise Old World pines produce wingless seeds that depend on birds — primarily nutcrackers — for dispersal. Whitebark pine is a shade-adverse, slow-growing mountaineer that can endure rocky footholds, relentless bone-dry winds, ice storms, lightning blazes — rigors of the most exposed, high-

elevation realms that stymie other trees. Across much of its range, including in Northeast Oregon, the native mountain pine beetle (whose outbreaks seem to be intensifying under our warming winters) and the exotic white pine bluster rust fungus, plus fire suppression, pose a grave threat to the whitebark.

Whitebarks grow in a variety of forms, from straight and tall (up to 80 feet or so) to the ground-hugging krummholz (German for "crooked wood") scrub of the loftiest, harshest sites. Its typical look in the timberline savannas and tree-island copses where it dominates (especially on west- and south-facing slopes and stony ridgetops) is a misshapen, multi-trunked pine with up-swept branches and plenty of bone-white deadwood in its weather-beaten scaffold. In

these dry, cold heights, whitebarks can live a long time: more than 1,000 years. We can only imagine how much longer they may stand as snag-skeletons, then lie amid the gravel and sandwort as driftwood-like logs.

The whitebark has evolved to depend on the industrious Clark's nutcracker — a brainy, black-winged corvid, relative of raven and jay — for its perpetuation. Nutcrackers harvest and bury whitebark seeds to make a long-term larder, showing astonishing memory in keeping tabs on their wide-scattered caches. New generations of whitebarks derive from forgotten (or simply not-gotten-to) nutcracker storehouses.

The persistence of whitebark pine on southerly exposures in the high country may not just be about their competitive advantage here,

but also because nutcrackers often favor these slopes — windswept, sunny, and partly snow-free much of the winter — for their pinenut caches. The birds also often bury whitebark seeds in ground cleared by wildfire, again because of quicker snowmelt and easier access; the mineral soil of these burns makes a prime nursery for the pines, too.

(In drier parts of the grizzly bear's Rocky Mountain range, the great "silvertip" feeds heavily on fatty whitebark pinenuts raided from squirrel stockpiles. It's interesting to speculate whether the vanished grizzlies of Northeast Oregon made pilgrimages to

the high whitebark groves like, for example, their Yellowstone counterparts still do.)

### Limber pine

The last of our pines is the most geographically restricted: the limber pine, which out here occupies only the limestone and marble of the High Wallows. In parts of the Great Plains and Rockies, limber pine grows at low elevations on the edge of grassland; in the Great Basin, it may be a mountaintop settler like the whitebark. In the Wallows — the extreme western frontier of the species' Northwest range — it's a subalpine specialist of the Martin Bridge Formation.

We may be a fringe outpost for the limber pine — a five-needled white pine similar in appearance to the whitebark but sprouting distinctively longer cones — but we do host one of the biggest-known specimens: the mighty "Dielman Monarch" of Cusick Mountain near the headwaters of the Imnaha River.

Gary Dielman of Baker City found the massive limber pine while descending from Cusick Mountain's summit on Aug. 20, 1998.

Forest Service ecologist Charlie Johnson (who died in 2007) estimated the pine's age at more than 2,000 years.



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