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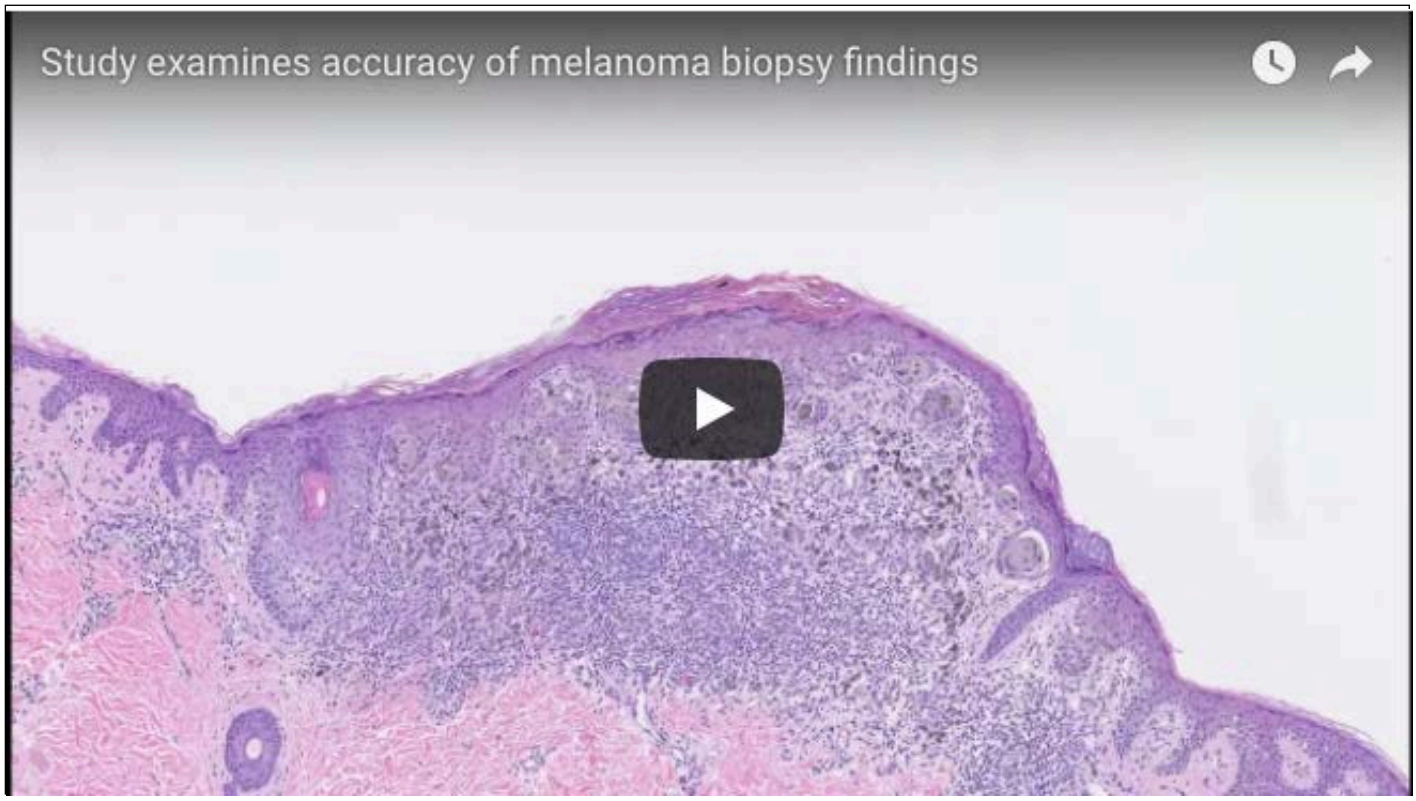
Skin Cancer Biopsy: Can You Trust the Results?

BY VANESSA RAYMOND (/AUTHORS/VANESSA-RAYMOND) **OCTOBER 13, 2017**



UW Medicine Newsroom

Ten years ago, Joann G. Elmore, M.D., M.P.H (http://www.uwmedicine.org/bios/joann-elmore), an epidemiologist and professor at the University of Washington School of Medicine, had a biopsy of a mole on her skin. At the time, she wasn't terribly concerned. To her eye, the mole didn't look all that suspicious for melanoma, the most serious type of skin cancer.

Initial Biopsy Result

A few days later—on a Friday night—she received a telephone call from her dermatologist. As a doctor herself, she knew that a call from your doctor on a Friday night is not usually good news.

“I hate to make this kind of call on a Friday night," began her dermatologist. About that phone call, Elmore says, "It was surprising. They couldn't tell whether the skin biopsy was or wasn't cancer, but it looked suspicious."

Second and Third and Fourth Opinions

Because the first biopsy was indeterminate, Elmore sought a follow-up biopsy. Her second biopsy was sent to two different pathologists for interpretation.

That's when things became even more surprising. When the diagnoses came in, one read "benign" and the other, "invasive melanoma." So Elmore now had diagnoses ranging from normal to abnormal but indeterminate to invasive melanoma.

Like any good doctor, Elmore decided to get yet another opinion. She chose a pathologist who had written textbooks on the topic and had decades of experience.

> **“ Given my own experience, I wanted to see how we could improve things. So we decided to turn the microscope back on ourselves to see how we are doing." ”**
>
> —Joann Elmore, M.D., M.P.H.

Discrepancies Inspire Study

Elmore's personal diagnostic odyssey ends well. Instead of melanoma, she had an atypical Spitz lesion that can mimic melanoma.

Ten years out, she is happy and healthy. But her experience—and the emotions that went along with it—inspired her to study the diagnostic process with an eye to improving it.

In addition to practicing as a physician, Elmore conducts scientific research. Prior to her skin biopsy, Elmore had researched the variability in how radiologists interpret mammograms (http://jamanetwork.com/journals/jama/fullarticle/2203798).

But her personal experience as a patient inspired her to expand her research from radiology into pathology. She wanted a better understanding of the variability of results there.

"I decided I wanted to study this," says Elmore. "Given my own experience, I wanted to see how we could improve things. So we decided to turn the microscope back on ourselves to see how we are doing."

Study Examines Accuracy

Elmore's study of the variability in melanoma diagnostic findings (http://www.bmj.com/content/357/bmj.j2813) was published in the *British Medical Journal*. The study began with 240 skin biopsy slides ranging from a normal mole to invasive melanoma.

Each of the skin biopsy slides was first interpreted by a panel of experts independently. Then the experts got together to reach a consensus. For the purposes of the study, the consensus among the experts was considered the gold standard diagnosis for each slide.

Elmore's research team then divided the biopsy slides into smaller sets and shipped them out to pathologists across the country. "There were 187 pathologists kind enough to help us," says Elmore. "These pathologists spent up to 20 hours volunteering their time."

The 187 pathologists reviewed the same slides on two occasions, at least eight months apart. Elmore's research team compared the pathologists' diagnoses against the gold standard diagnosis for each slide as well as against their previous diagnosis of the same slide.

Surprising Variability in Findings

Elmore's research team discovered that pathologists are likely to agree on the diagnoses when evaluating skin biopsies that are either benign or highly malignant. But for those lesions that fell into the middle gray area—neither clearly benign nor malignant—pathologists frequently disagreed on the diagnosis. In fact, the pathologists disagreed on those cases more than half the time.

Elmore elaborates, "A skin biopsy can be read as normal or slightly atypical to melanoma in situ to invasive melanoma. It was in these diagnoses in the middle that there was very little agreement."

Pathologists even disagreed with their own previous diagnosis of the same slide. When they gave a diagnosis of melanoma in situ, they agreed with this diagnosis the second time they read the same slide from 35 percent to 63 percent of the time.

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> —Joann Elmore, M.D., M.P.H.

Elmore explains that this low level accuracy is not the pathologists' fault. "These are highly trained and skilled pathologists," says Elmore. "But they are looking at an image of tissue and they are zooming in and out on their microscopes. There is no objective measurement. They are making a judgment call."

Pathologists must decide if the biopsy is normal, abnormal or needs to be classified according to the melanoma skin cancer staging (http://healthlibrary.uwmedicine.org/Search/34,17265-1) system. "While we do have criteria that have been published about how to classify melanoma, medicine is an art. It can be subjective," says Elmore. "I think pathologists have a very challenging job."

Recommendations for Improvement

Within their study, Elmore's research team recommended several methods to improve consistency in the classification of biopsies:

- Adopting a classification system that is both simpler and more standardized
- Adding statements to pathology reports reminding patients that biopsies are difficult to interpret—particularly those in the middle range
- Developing new objective techniques to help support pathologists’ subjective visual assessments

Elmore wants patients to understand the challenge of classifying biopsies—a challenge that she experienced firsthand. "My study reminds us all, patients and doctors alike, that there is inherent uncertainty in the practice of medicine."

> ## Melanoma Facts
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> - Melanoma is the second most common cancer in people aged 15 to 29.
> - The disease accounts for 5 percent of all skin cancers and 71 percent of all skin cancer deaths.
> - Melanoma kills approximately 9,000 Americans per year.
> - It is growing at an epidemic rate with an estimated 3 percent increase in cases annually.