



# Wipe Out Melanoma – California

**LEADING THE WAY** IN PREVENTION, COMMUNITY OUTREACH, AND NOVEL DIAGNOSTICS

## Reducing the toll of melanoma

### **THE PROMISE OF EARLY DETECTION**

As one of the most fatal types of cancer, melanoma accounts for nearly 9,000 deaths in the United States every year—one person every 54 minutes. More than 100,000 new cases are diagnosed in the country annually.

A light skin complexion, excessive exposure to ultraviolet light from the sun, employment or recreation outdoors, family history, and/or a large number of moles are among the risk factors for developing the disease. Health disparities in melanoma are now known, with worse outcomes for patients of low socioeconomic status, certain racial-ethnic minorities, and those living in rural areas, who have less access to health care and skin specialists.

Unfortunately, melanoma is prone to spreading to other areas of the body, where it becomes much more difficult to treat. Yet the good news is that, if recognized and treated early, melanoma is generally curable—indeed, early detection and diagnosis are critical to reducing mortality.

Stanford dermatologists have helped establish national evidence-based treatment guidelines and are leaders in melanoma prevention and scientific research to understand who develops melanoma and why. Researchers here are working hard to reduce the toll that melanoma takes on patients and their families, including the thousands of deaths from metastatic disease and the associated enormous health-care and societal costs.

## **DIAGNOSING SKIN CANCER**

Diagnosing skin cancer begins with a visual examination. A dermatologist usually looks at the suspicious lesion with the naked eye and with a handheld instrument—called a dermoscope—that provides low-level magnification of the skin. If these methods lead the dermatologist to believe the lesion might be cancerous, a skin biopsy is the next step.

Stanford researchers have used deep learning—a type of artificial intelligence modeled after neural networks in the brain—to take a major leap in skin cancer diagnosis. They have applied this method to visually diagnose skin lesions, creating an algorithm for skin cancer diagnosis that augments the performance of dermatologists and has performed with inspiring accuracy in the experimental setting. Researchers are now refining a new smartphone tool and evaluating its potential in the real-world clinical setting as a means to enhance early detection of melanoma, other skin cancers, and dermatologic conditions—while at the same time creating innovative ways to provide improved dermatology specialist access to regions of scarcity for the diagnosis of other skin lesions.

In other research efforts, patient samples are being collected in a biobank as a source for prospective analysis to determine patient outcomes—including for gene expression signatures, sequencing, and bioinformatics investigations—which can help provide information on patient outcomes and who should receive certain treatments or tests following diagnosis. Through a statewide initiative called “Wipe Out Melanoma – California,” Stanford faculty members are leading in efforts to provide education to medical professionals and the public to improve melanoma awareness and recognition across all racial/ethnic groups and socioeconomic classes to ensure that appropriate care is delivered at the earliest possible stage—which will improve the lives of many patients and their families.

Stanford investigators in dermatology are at the forefront of research—publishing more new, high-impact research articles than the next top 10 dermatology departments combined. And they continue to apply this new knowledge to improving care for thousands of patients in California and beyond.

## Taking a leading role | Stanford research in melanoma

### **ARTIFICIAL INTELLIGENCE WITH A SMARTPHONE**

Recent advances in artificial intelligence harness large datasets to enable algorithms to sift out complex patterns in raw data. Deep learning has a long history in computer science, but has only recently been applied to visual-processing tasks—with remarkable success.

A technology-based approach to improve the diagnosis of melanoma across people of all skin types and backgrounds—including people without immediate access to a dermatologist—could reduce unnecessary biopsies and health disparities and improve patient outcomes. And new regulatory guidance from the FDA has simplified the approval process for diagnostic devices using artificial/augmented intelligence.

In hopes of creating better access to medical care, a multidisciplinary group of Stanford scientists used this pattern-recognition approach to create a database of nearly 130,000 skin disease images across the dermatology spectrum. They have refined photographic aspects by gathering images of biopsy-proven lesions, and now plan to collect suspicious pigmented lesions biopsied during routine clinical care at Stanford and the Cleveland Clinic.

With multiple studies demonstrating the technology’s potential, Stanford researchers have laid the groundwork to now test their artificially intelligent algorithm for skin cancer diagnosis in the “real-world” clinical setting—the next step in this research with the smartphone app.

They believe the algorithm can be efficiently implemented in a teledermatology and multi-site clinical setting, improving physician speed of diagnosis and improving accuracy, while positively impacting patient outcomes and decreasing wait times to see a specialist. This would be the first systems-wide application of artificial intelligence to evaluate skin lesions in the field of dermatology and to truly explore the ability of AI to augment human decision making and improve patient outcomes.

## CLINICAL RESEARCH

Beyond providing the most advanced therapies, including immune-based and targeted treatments that offer hope for late-stage melanoma, the Stanford Department of Dermatology offers numerous clinical trials to increase the chances of cure.

Stanford is taking part in a National Cancer Institute-sponsored early-phase chemoprevention consortium, studying medications, vitamins, supplements, and other agents that may prevent melanoma from developing. Researchers are studying individuals with more than one melanoma to understand the genetics that contribute to melanoma. Studies like these will help us identify at-risk people to enable early screening and help prevent skin cancer.

Philanthropic support has helped our efforts to bank patient samples. Stanford researchers are now working on a project that will use the latest technology in single-cell sequencing and bioinformatics to analyze a dataset derived from the patient samples collected through the biobank. This project, if successful, will allow researchers to develop a unique gene-expression signature that will be useful in predicting the response of a patient's melanoma tumors to immune checkpoint blockade therapy, such as PD-1 inhibitors.

## Providing community education and outreach

### WIPE OUT MELANOMA – CALIFORNIA CAMPAIGN

Private philanthropy helped the department lay the groundwork for launching a new public health campaign to promote detection of melanoma in its most curable phases—and thus enhance the likelihood of a cure.

“Wipe Out Melanoma – California” aims to reduce melanoma incidence and mortality in California. It is an offshoot of the national War on Melanoma™ program, which was established in 2014 at Oregon Health & Science University with philanthropic support. Susan Swetter, MD, is leading the effort at Stanford and throughout California.

In this community-outreach effort, Stanford researchers hope to engage melanoma survivors, and their family and friends, by creating the Melanoma Community Registry of California that interacts with the national War on Melanoma™ registry and offers Californians opportunities to take part in research studies related to prevention, early detection, and treatment. For this type of investigation to make a difference, we need people across the state to participate in these studies, and continued funding is needed to sustain the effort.

By educating patients, health-care providers, and the broader community on how to detect and prevent melanoma, we aim to save lives and “wipe out” the impact of this devastating disease altogether. For more information, visit: [med.stanford.edu/cancer/community/projects/WOM](https://med.stanford.edu/cancer/community/projects/WOM).

## MELANOMA FACTS

- ▶ *Keratinocyte carcinomas are the most common human malignancy, with more than 5 million cases a year in the United States. However, melanoma is the most common fatal skin cancer.*
- ▶ *The annual cost of treating newly diagnosed melanoma is projected to triple from 2011–2030 to \$1.6 billion.*
- ▶ *Access to dermatologists can be challenging, with average wait times of more than a month across the country, and nearly three months in some urban centers.*
- ▶ *A comprehensive national skin cancer prevention program from 2020–2030 could prevent more than 230,000 new melanoma cases and nearly \$3 billion in initial treatment costs.*

## SUNSPORT

The Stanford University Network for Sun Protection, Outreach, Research and Teamwork (SUNSPORT) is a collaborative effort across the university to provide education and protection against skin cancer and other damage caused by sun exposure. As the most comprehensive and recognized sun protection outreach and research program of any university in the nation, SUNSPORT aims to reduce the incidence of skin cancer in Stanford's student-athletes, athletic faculty and staff, fans and supporters, and the university community at large. SUNSPORT educational outreach is provided at home sporting events such as football games, swim meets, and golf tournaments, as well as sun protection programs to local K-12 schools, as we aim to improve primary prevention of all skin cancers, starting at the earliest ages possible. For more information, visit: [med.stanford.edu/sunsport](http://med.stanford.edu/sunsport).

## Opportunities for partnership

Every day, Stanford researchers are making new discoveries about how skin cancers start and spread, and how they can be halted in their tracks. Investigators around the world are building on scientific breakthroughs and using tools invented here to translate discoveries in the lab into patient care.

With the help of philanthropy, what we learn about skin cancer—which occurs right in front of our eyes—will help us solve dilemmas related to other cancers that grow out of sight.

### **Wipe Out Melanoma – California Program Coordinator | \$1.2 million endowed or \$100,000 expendable**

Postdoctoral researcher in public health, epidemiology, or dermatology

### **Program Support | Gifts of any size toward a \$2 million endowment**

Including prevention education and outreach efforts, especially to reach high-risk populations

### **Seed Grants | \$250,000 and above**

To fund and support innovative interdisciplinary melanoma research projects

### **Technology Research Fund | \$500,000 – \$1 million**

To procure and maintain advanced imaging equipment and space to test the latest in artificial intelligence technology and 3D imaging modalities to diagnose patients and improve access to care

Thank you for your interest in joining with others to help advance our melanoma research efforts. With your partnership, we can transform the way that melanoma is prevented and treated, improve outcomes and quality of life, and help save lives around the world.

“You have the power—right here, right now—to help prevent this disease from taking your life. You can do this simply by checking your own skin and that of your loved ones for any kind of unusual ‘ugly duckling’ mole or spot that may be indicative of early melanoma. If you find a suspicious spot on your skin, you should see a medical professional right away. When in doubt, check it out!”

— NANCY WRIGHT  
*Melanoma patient*

## CONTACT US

For a personalized conversation about how your philanthropic support can make a difference in the prevention and treatment of melanoma, please contact:

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