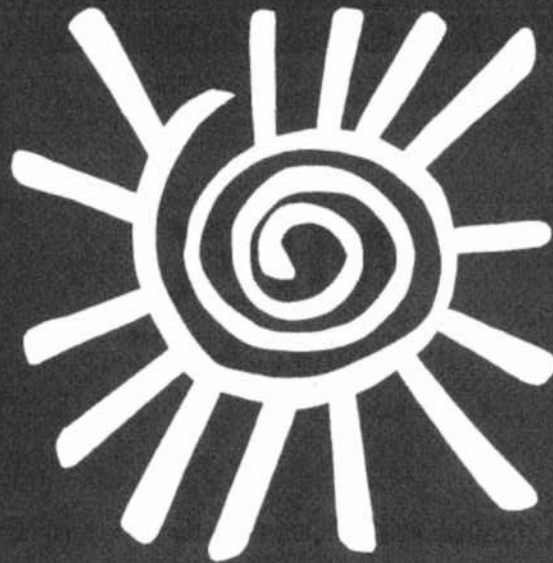


MAY 1993
VOL. 52, No. 5
ISSN: 0017-8594

Hawaii MEDICAL JOURNAL

PRACTICE



SAFE  SUN

HAWAII

SPECIAL  REPORT



MIEC

1-800-227-4527

Professional Liability Insurance Exclusively

Medical Insurance Exchange of California

6250 Claremont Avenue, Oakland, California 94618

Telephone: (800) 227-4527 Fax: (510) 654-4634

Sponsored by Hawaii Medical Association

Hawaii Claims Office: 1360 S. Beretania, Suite 405, Honolulu, Hawaii 96814, Telephone 808-545-7231

HAWAII MEDICAL JOURNAL

(USPS 237-640)

Published Monthly for the
HAWAII MEDICAL ASSOCIATION
(Incorporated in 1856 under the Monarchy)
1360 South Beretania, Honolulu, Hawaii 96814
Ph. (808) 536-7702; FAX (808) 528-2376

EDITORS

Editor: J I FREDERICK REPPUN MD
Founding Editor: HARRY L ARNOLD JR MD
News Editor: HENRY N YOKOYAMA MD
Contributing Editors: RUSSELL T STODD MD,
FRANCIS H FUKUNAGA MD
Editorial Assistant: SUSANNE WEEKS
Publisher: STEPHEN S LENT

Editorial Board

NORMAN GOLDSTEIN MD
ROBERT T S JIM MD
JAMES LUMENG MD
FRANCIS D PIEN MD

Publications Committee

MYRONE E SHIRASU MD (*Commissioner*)
HENRY N YOKOYAMA MD (*Chair*)
ERLAINE BELLO MD, STEPHEN R P K BRADY MD,
NADINE BRUCE MD, NATHANIEL P H CHING MD,
OSAMU FUKUYAMA MD, ROBERT C GALAGAN MD,
FRED GILBERT JR MD, ROBERT HOLLISON MD,
AMOD JAIN MD, ROBERT T S JIM MD,
JOHN H C KIM MD, H LORRIN LAU MD,
JAMES LUMENG MD, BAL RAJ MEHTA MD,
FRANCIS PIEN MD, J I FREDERICK REPPUN MD,
MYRON E SHIRASU MD, KIM THORBURN MD,
RONALD J WONG MD, TERRY C Y WONG MD,
GUY N YATSUSHIRO, JEANETTE H J CHANG MD

OFFICERS

President: JEANETTE H J CHANG MD
Past-president: STEPHEN J WALLACH MD
President-elect: ANDREW DON MD
Treasurer: JOHN S SPANGLER MD
Secretary: FREDERICK C HOLSCHUH MD

County Presidents

Hawaii: RICHARD K M LEE-CHING MD
Honolulu: CARL W LEHMAN MD
Mau: BARRY SHITAMOTO MD
West Hawaii: MINOLU R CHENG MD
Kauai: RICHARD GOODALE MD

Delegates to AMA

CALVIN C M KAM MD
RUSSELL T STODD MD

Alternate Delegates to AMA

JEANETTE H J CHANG MD
ALLAN R KUNIMOTO MD

Advertising Representatives

CROSSROADS PRESS, INC.
Post Office Box 833
Honolulu, Hawaii 96808
Phone (808) 521-0021

Pharmaceutical Advertising

STATE JOURNAL GROUP
711 South Boulevard
Oak Park, Illinois 60302
Phone (708) 383-8800

Practice safe sun logo: Heather Chun

THE JOURNAL cannot be held responsible for opinions expressed in papers, discussions, communications, or advertisements. The advertising policy of the HAWAII MEDICAL JOURNAL is governed by the rules of the Council on Drugs of the American Medical Association. The right is reserved to reject material submitted for editorial or advertising columns. The HAWAII MEDICAL JOURNAL (USPS 237640) is published monthly by Crossroads Press, Inc., for the Hawaii Medical Association, 1360 South Beretania, Honolulu, Hawaii 96814. Second-class postage paid at Honolulu, Hawaii. Non-member subscriptions are \$25. POSTMASTER: Send address changes to the HAWAII MEDICAL JOURNAL.

"CHART's program was just fantastic!"

As he was bending over and lifting luggage onto an airplane, baggage handler Austin Whiting "snapped" three discs in his lower back.

"I felt a very sharp pain, and the next day, I had to crawl to the bathroom," Austin recalls. "I couldn't move. For the whole week, I couldn't stand, walk, or even sit. This injury kept me out of work for about four months."

After having back surgery in January 1992, Austin began CHART's program of active rehabilitation and total body reconditioning. Austin was glad to return to his job after only 6 weeks of active rehab.

"CHART is the best," Austin says. "CHART got me physically fit, and I enjoyed their program. CHART's staff was just great!"



1505 Dillingham Blvd.. #110
Honolulu, HI 96817
Phone: 841-6006

94-810 Moloalo Street
Waipahu, HI 96797
Phone: 671-1711

Mahalo to Dr. Norman Goldstein
and the Hawaii Dermatological Society for
all of their hard work in producing the May
issue of the Hawaii Medical Journal.

-Keith Tonaki, M.D., FCAP

CONTENTS

| | | | |
|--|-----|--|-----|
| EDITORIALS J I Frederick Reppun MD Norman Goldstein MD, FACP | 108 | THE GENDER-RELATED ISSUES IN MALIGNANT MELANOMA Darrell S Rigel MD, FAAD | 124 |
| LETTERS TO THE EDITOR Christian L Gulbrandson MD Katsuji Kubo MD Christine Trecker | 110 | SKIN CANCERS IN HAWAII (1993) Norman Goldstein MD, FACP | 126 |
| THE AMERICAN CANCER SOCIETY STARTS A CAMPAIGN David Free | 114 | SURGICAL TREATMENT OF MELANOMA Scott Hundahl MD, FSSO | 130 |
| NEW ULTRAVIOLET MONITORING TECHNOLOGY Douglas McG Clarkson M Phil, BSc Nick Grunfeld William J Hewak BSc | 116 | MOHS MICROGRAPHIC SURGERY: A SYNOPSIS Jenny L Stone MD | 134 |
| OZONE DEPLETION: CAUSES, POTENTIAL EFFECTS, AND REMEDIES Bruce J Miller PhD Scott P Bogle AB | 118 | THE KAUAI SKIN CANCER STUDY 1983 TO 1992 George T Reizner MD | 140 |
| | | LEARNING TO SAVE OUR SKIN Paul Berry | 142 |
| | | MAKA O KE KAUKA Russell T Stodd MD | 147 |
| | | CLASSIFIED NOTICES | 148 |



Skin Cancer/ Melanoma Month of May 1993

We did it !

On rather short notice, but stimulated by HMA Publications Committee member Norman Goldstein, the *Journal* has succeeded in coming out with a special issue devoted to the subject of skin cancers and melanomas.

Norm has done a great job of assembling manuscripts authored by an interesting variety of people in our community

Practice Safe Sun-Hawaii

When the American Cancer Society Hawaii Pacific Division asked me to serve as the 1993 Honorary Chair of the Neighborhood Education Campaign, I politely responded with a "Sorry, I can't; I'm just too busy." Then, when a busy attorney and long-time ACS volunteer, Jacqueline Earle, and a busy oncologic surgeon and chair of the ACS Hawaii Pacific Division, Scott Hundahl MD, again asked me — I just had to say "Yes."

After promoting prevention, early diagnosis and treatment of skin cancer, melanomas and wrinkles in Hawaii for almost 30 years, I felt I *must* help the ACS this year. Since the ACS had 10,000(!) volunteers ready to go door-to-door and business-to-business to distribute information and sunscreen samples to Hawaii residents and tourists, all I had to do was offer some expertise, get some people together and obtain some sunscreen samples.

And, we're off and running!

The American Academy of Dermatology has sponsored free skin cancer screening clinics in all states for 8 years. The Hawaii Dermatological Society, with the assistance of plastic

— physicians and nonphysicians alike.

Nine years ago, Norm put in a great effort in a special issue to honor Harry Arnold Jr, Hawaii dermatologist of world renown and editor for 40 years of the *Journal*.

We salute Norman Goldstein MD, FACP, Hawaii dermatologist and guest editor of this issue.

surgeons and other physicians, has been doing these clinics for 15 years — usually in churches, school cafeterias — any place that would take us and provide parking.

This year, Liberty House was kind enough to offer each of its Oahu and Neighbor Island department stores for the free skin-cancer clinics in order to reach a larger statewide population. The ACS arranged for scheduling of the clinics and had hundreds of volunteers help the dermatologists do the screenings, distribute sunscreen samples and educational materials.

Dermatologist Randy Mita ("Doctor POG") came up with a novel promotional idea: the Skin POG (milk bottle cap). Milk bottle caps are the biggest rage ever — even bigger than Pet Rocks and Rubik's Cube. The "Practice Safe Sun — Hawaii" POGs have proven to be so popular that the initial 35,000 produced were not enough to supply our youngsters' demands. Great way to get children to use sun protectives daily.*

Movie and TV star and part-time Hawaii resident Tom Selleck is also the Honorary Chair of the National Skin

(Continued on page 110) ►



The reason behind Neutrogena® Sunblock SPF 15, Sunblock SPF 30, and now Sunblock Stick SPF 25 (for easy application on hard-to-protect areas), has always been *total* protection.

Not just against UVB rays, but against UVA and IR as well. And not just under perfectly controlled lab conditions, but proven under the conditions real people experience when they work or play in the sun.

That's why we formulated these sun protection products to keep right on working when active people sweat, swim, or towel themselves dry.

But while we're proud of the *total protection* they provide, we realize they don't protect the *total number* of patients you treat. So for those patients who are sensitive to the chemical sunscreens used in most sunblocks, we offer broad-spectrum Neutrogena® Chemical-Free Sunblocker SPF 17.

Its titanium dioxide-based sun protection provides physical blocking, but with none of the usual white opacity patients find so objectionable. Instead, Chemical-Free Sunblocker is aesthetically acceptable because it blends easily into the skin.

For daily facial sun protection with hydration, there is Neutrogena Moisture® SPF 15, Tinted and Untinted.

Of course, all of these products provide broad-spectrum UVA/UVB protection, are PABA-free, fragrance-free, hypoallergenic, and non-comedogenic.

So recommend the name you can always count on, as sure as the sun will rise.

For more information or patient samples, please call 1-800-237-5847.

Rub-proof.
Sweat-proof.
Water-proof.

Chem-proof.



Neutrogena®

A Healthier Way To Look At The Basics.®

EDITORIALS (Continued from page 108)

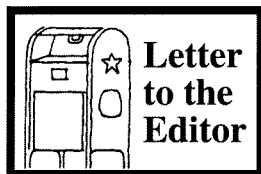
Cancer Foundation. Tom has helped to promote the "Hats in Hawaii" campaign to encourage the use of wide-brimmed hats and UV-protective garments and did some public-service announcements for the campaign.

The Skin Cancer Foundation and the Sun Protection Foundation, major national educational organizations, have provided brochures, videotapes and slide presentations to help train the 10,000 volunteers.

Students and friends of the John A Burns School of Medicine have helped at screening clinics over the years, and at the Liberty House skin cancer clinics, as well as health and fitness fairs at Blaisdell Center, Thomas Square Park and at the University of Hawaii.

With the leadership of Bruce Miller MD and Scott Bogle of the Hawaii Global Change Education Project of the Sea Grant Extension Service, we organized a Sun Awareness Steering Committee to help coordinate our programs. Miller and Bogle were instrumental in getting the first ozone laws in the country passed right here in Hawaii. Their "Hole Story"

* Thanks to an educational grant from Glaxo Dermatology, a division of Glaxo Inc. and Pam Felix, "Dr. POG" produced 100,000 for our program.



The John A Burns School of Medicine (JABSOM) applauds the *Hawaii Medical Journal* in its special issue which deals with melanoma and skin cancer. This malady is of interest to all of us who live in Hawaii because the incidence of all three forms of skin cancers (basal and squamous cell cancer and malignant melanoma) continues to increase at an alarming rate.

The Dermatology Division of JABSOM, with the collaboration of the members of the dermatologic community and the Cancer Research Center of Hawaii, is committed to dermatologic education. The objectives of the Division are threefold: 1. to provide a basic core curriculum of clinical dermatology to medical students, 2. to offer an opportunity for clinical rotations in dermatology to medical residents in hospital clinics and private offices, and 3. to conduct continuing medical education courses and seminars in the advancing fields of dermatology to practicing community physicians, allied health care personnel and the general community.

The core curriculum in dermatology includes an introduction to the basic structure and function of the skin, general patterns of dermatopathology, and identification of common dermatologic diseases. The emphasis in clinical dermatology is on those skin diseases most likely to face primary care physicians. In addition, a block of time is devoted in the

The Hawaii Plastic Surgery Society membership applauds the editorial board of the *Hawaii Medical Journal* for focusing on the melanoma/skin cancer problem.

The past several decades have seen an alarming increase in malignant melanomas and other skin cancers. Thirty-two thousand new melanoma cases in the U.S.A. with 6,800 deaths are estimated to occur in 1993 (data from NCI SEER program). Seventy new cases and 20 deaths are estimated in Hawaii alone. Fortunately, there has been a concomitant

booklet has had many printings.

The Cancer Research Center of Hawaii, the Hawaii Tumor Registry and the Queen's Tumor Registry were very supportive and supplied data on melanoma in Hawaii. Because of this data and data from private practice, we are now very aware that melanomas and other skin cancers occur in all races, not just the fair-skinned Caucasians.

Paul Berry at Punahou School started a very unique program to increase student awareness of the dangers of excessive sun exposures and the need for sun protection. This model program will be provided to other schools, private and public.

Finally, my personal mahalo to the American Cancer Society volunteers, Alice Vinton ("Vinton Volunteers"), to the dermatologists and other physicians, to Donald Onasch and Liberty House, to the staff of the Hawaii Medical Association, to Fred Reppun MD, Editor, and to the staff of the *Journal*, the contributing authors and advertisers who made this special issue possible — Mahalo and "Practice Safe Sun—Hawaii!"

Norman Goldstein MD, FACP
Guest editor, special issue on melanoma/skin cancer

Problem-Based Learning format to acquaint medical students about the basic principles of photobiology. The areas of emphasis include an understanding of the ultraviolet light spectrum, the acute and chronic effects of ultraviolet light management of skin diseases. The concepts of photoaging and photoprotection are introduced. Important attention is focused on skin cancers.

The dermatologic community is credited for their annual voluntary Cancer Screening Program which has resulted in early detection of numerous skins cancers and melanomas. In addition, the Cancer Research Center of Hawaii has helped to track the incidence of melanoma in Hawaii and together with the physicians of the dermatology community, offers updated diagnostic and therapeutic guidelines for practicing physicians in Hawaii.

JABSOM will continue its efforts to train and educate future physicians in the care, treatment and research of dermatological conditions. With well-trained professionals and an enlightened community, Hawaii indeed will be the best place to live on this earth.

Christian L Gulbrandson MD
Dean
John A Burns School of Medicine
University of Hawaii

improvement in 5-year survival rates (60% in the 1960s to 80% in the 1980s). Better understanding of the biological behavior of melanomas, particularly in regard to tumor thickness and levels of invasion, have helped to outline more logical and effective treatment plans.

However, the improved survival rates probably to a great extent can be attributed to earlier detection of the cancers. Treatment of advanced melanomas remains challenging and controversial. Therefore, early recognition and prevention of

(Continued on page 113) ►



Because One Size Doesn't Fit All...

Eli Lilly and Company can suit all your needs with the most complete line of human insulins available.

Featuring Humulin 70/30* and our latest addition to the premixed line, Humulin 50/50† — especially useful in situations in which a greater insulin response is desirable for greater glycemic control.



Humulin® 
human insulin
(recombinant DNA origin)

*Tailor-made options in
insulin therapy*

WARNING: Any change of insulin should be made cautiously and only under medical supervision.

*Humulin® 70/30 (70% human insulin isophane suspension, 30% human insulin injection [recombinant DNA origin]).

†Humulin® 50/50 (50% human insulin isophane suspension, 50% human insulin injection [recombinant DNA origin]).

Lilly

Global Excellence in Diabetes Care
Eli Lilly and Company
Indianapolis, Indiana
46285

THE LEASE THAT'S ULTRA SOUND.



To stay in sound financial health, many hospitals lease their equipment through Bancorp Leasing. To chart one—Straub Clinic and its new Cardiac Ultrasound Machine, a critical heart monitoring unit in Straub's state-of-the-art Cardiac Cath Lab.

The prognosis? Bancorp Leasing is doing well with its competitive rates, flexible terms, professional service.

Whether you need a \$10,000 computer or diagnostic equipment a hundred times that, give Bancorp Leasing a call at 537-8810. On the Neighbor Islands, 1-800-451-6022.



Bancorp Leasing of Hawaii

LETTERS TO THE EDITORS
(Continued from page 110)

melanomas and other skin cancers remain the primary goals for continuing education of the public and health care community.

Katsuji Kubo MD
President
Hawaii Plastic Surgery Society

Yes, it is possible to have fun out of the sun in Hawaii. In recent years, the mass media have repeatedly echoed the concern of dermatologists and ophthalmologists about the dangers of overexposure to the sun. It is now clear that the American public has taken note. With the ozone thinning, the problems are going to be even greater than earlier estimates indicated. Sunscreen sales have skyrocketed, people are now aware of the significance of the SPF (Sun Protective Factor), major cosmetic companies have launched "Tan without the Sun" products, and fair-skinned models now grace the covers of many fashion magazines.

In light of these recent trends, I wrote the first Oahu guidebook devoted exclusively to indoor activities in 1991 and am presently updating it again to add even more fun indoor activities. *Fun Out of the Sun/The complete guide to Oahu's great indoors* is the ideal guide for "sun smart" consumers who want to avoid or limit their exposure to the sun, particularly from 10 AM to 2 PM when the sun's rays are the most intense. This unique guidebook includes a wide range of out-of-the-sun activities, everything from visits to Oahu's most popular indoor attractions such as the Bishop Museum to offbeat diversions like ice skating, a submarine ride, or experiencing a Japanese tea ceremony. We really don't have to give up outdoor fun—just use common sense and enjoy the indoors.

The Hawaii visitor and resident of the 1990s is ready for this indoor guidebook. Existing visitor literature focuses heavily on outdoor, sunny weather pursuits. It really doesn't address the many visitors and locals who are looking for indoor activities during the hot mid-day period, or those who are already sunburned, or the visitor and resident who is sun-sensitive. Exposed to almost constant sunshine year-round, Islanders are prime candidates for "undercover" activities. *Fun Out of the Sun's* emphasis on indoor activities makes it an excellent guidebook for rainy days too. Residents and visitors alike are often stumped for things to do during Oahu's rainy season. Visitors especially run out of ideas when the downpour lasts longer than two or three days.

All profits from the sale of *Fun Out of the Sun* are donated to Friends of Foster Kids, a non-profit organization dedicated to developing and supporting quality foster care in Hawaii. *Fun Out of the Sun* is available at book shops throughout Oahu or can be ordered by phone: 262-0071.

Christine Trecker

(Continued on page 146) ►

Finally, a line of sunblock products that protect for 8 hours with one application!



SPF 30
SUNBLOCK
for Children



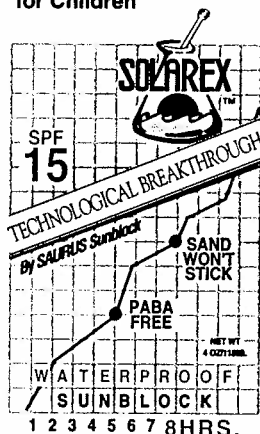
SPF 15 & 30
SUNBLOCK



SPF 30
LIP/NOSE



SPF 30
SUNBLOCK



Available in 15 & 30 SPF

- Stays on 8-hours. Won't wash off, sweat off, or towel off.
- Sand won't stick.
- Penetrates completely in 2 minutes.
- PABA-free, No Padimate-O, Unfragranced.
- Blocks UVA & UVB rays.
- Tested and approved by AMA Laboratories for 8 hour+ sun protection. Wholesale prices to physicians. Credit terms available.

Distributed by
Blue Water Sports Supply, Inc.
676-1963

NEW 225ml and 400g PUMP BOTTLE

LAC-HYDRIN^{12%}
ammonium lactate lotion

Healthy skin starts from within.
Improves, Repairs, and Maintains the Structure and Function of the Skin

- New pumps for easy dispensing
- Effective therapy for dry, scaling, and itching skin

WESTWOOD SQUIBBTM
262-7598

LAC-HYDRIN^{12%}

The American Cancer Society Starts a Campaign

David Free*

Introduction

A Society volunteer for more than 10 years, David worked his way up through the volunteer ranks. Originally from Southern California, David majored in advertising and marketing at the University of Southern California. After moving to Hawaii 16 years ago, he became editor of the International Society of Islands.

David is Director of Production at Crossroads Press, publisher of Pacific Business News and the Hawaii Medical Journal. He has been with the company 13 years.

His review of the ACS in Hawaii follows.

*Norman Goldstein MD
Guest editor*

Volunteers in the American Cancer Society's Hawaii Pacific Division have chosen "Practice Safe Sun" as the theme for the May 1993 neighborhood educational campaign. The neighborhood campaign is an annual residential door-to-door fund-raising canvass with an educational message important to the people of Hawaii. This year many other agencies are joining the Society, making delivery of this message a community-wide program.

The American Cancer Society

The American Cancer Society (ACS) is the largest volunteer health organization in the U.S. This year the Society is celebrating 80 years of service to the nation. Back in 1913, the word cancer was rarely spoken and only 1 cancer patient in 5 could hope to live. Now, the survival rate is about 50% percent!

The Society's goals have expanded over the years and now the mission is to eliminate cancer as a major health problem by preventing cancer, saving lives from cancer, and diminishing suffering from cancer through research, education and service.

The ACS national home is in Atlanta, Georgia. From there, the national volunteers oversee operations with the assistance of a national staff.

The Hawaii Pacific Division is one of 57 divisions nationwide, providing Society services to every state, plus the District of Columbia and Puerto Rico.

In Hawaii, the ACS traces its beginnings to the late 1940s. Now, 40-plus years later, we have a roster of some 13,000 volunteers!

Local unit offices in each division provide the services for which the Society is so renowned. The Hawaii Pacific Division currently has 8 unit offices: There are 3 on Oahu, 2 on the Big Island and 1 each on Kauai, Maui and Guam. The American Samoa unit is reactivating and the Molokai branch opened an office this past year.

Service to the Community

Research, education, service and rehabilitation are the primary programs provided by the ACS. Since 1946, the Society has spent more than \$1.4 billion to find ways to prevent, detect and treat cancer. Researchers who are awarded ACS grants are among the best in the country. Twenty-five have won the Nobel Prize, 7 of them since 1986.

As a matter of policy, approximately 1/4 of ACS budgets (both at national and division levels) go to research. The Hawaii Pacific Division is very proud of the fact that nearly \$700,000 of research grants were funded for the University of Hawaii Cancer Research Center by the Society in the 1990s.

Educational efforts help the public in specific ways to lower the risk for cancer through quitting smoking, proper nutrition and limiting exposure to the sun. The ACS stresses the importance of tests for early detection of breast, colorectal, prostate and other cancers. The Society also provides up-to-date information and materials to health professionals.

Service and rehabilitation programs offer information, guidance and support for cancer patients and their families. "Angels on Wheels" is a subset that provides volunteers who drive patients to their appointments for treatment. Home care supplies and equipment are available. "Reach to Recovery," for women who have had breast cancer, is one of ACS's larger support groups.

In delivering the early detection message, cancer education programs are provided through clubs and organizations and in homes, schools and churches. We use a speaker's bureau, videos, brochures and person-to-person contact, such as the annual neighborhood educational campaign in May to disseminate these educational messages. The information reaches more people today than ever before through the news media.

As a volunteer organization, we are proud that our volunteer-to-staff ratio is among the highest in the country. In addition to providing most of the services, volunteers serve on boards of directors and standing committees at the national, division and local levels.

The Hawaii Pacific Division is especially proud that Reginald C.S. Ho MD of Straub Clinic & Hospital currently is the Society's national president.

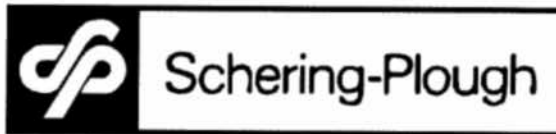
Practice Safe Sun

With the help of many similar-minded groups throughout Hawaii, we envision the Practice Safe Sun program to evolve into an on-going program to educate all residents of Hawaii. "Every BODY can get skin cancer, regardless of skin color" is the "tag-line" for the campaign. It was chosen to try to convince Hawaii residents that fair-skinned people are not the only ones who get this most-common form of cancer.

American Cancer Society volunteers asked prominent Honolulu dermatologist Norman Goldstein to work with them on the Practice Safe Sun campaign. Dr. Goldstein has advocated this message for many years and has been a valuable resource as the Society developed various facets of the program.

(Continued on page 120) ►

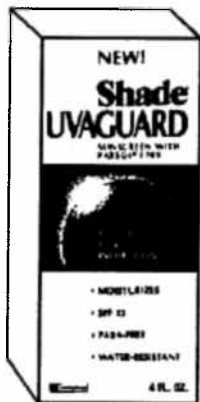
* President
American Cancer Society
Hawaii Pacific Division



Introduces ^{NEW!} Shade UVAGUARD™ ...

Technologically advanced sunscreen with PABA-free UVB protection and *extended* UVA protection. Superior UVA protection contains two UVA blocks—Oxybenzone and Parsol 1789, a breakthrough UVA sunscreen ingredient

In 1991, 238MM prescriptions (14% of total) were written for products which can cause photosensitivity reactions. Shade UVAGUARD offers extended protection from the deep UVA rays that contribute to skin damage and premature aging.



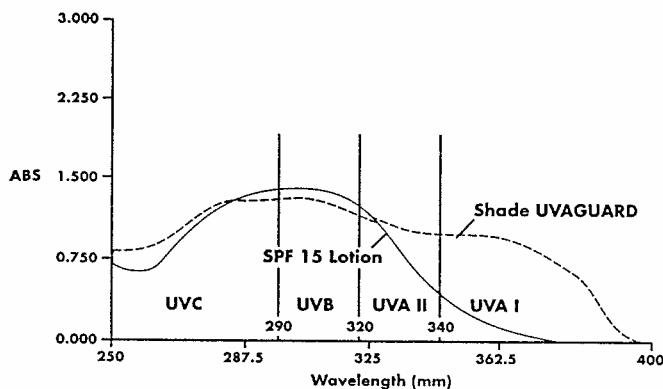
- Nine years in development
- Fully substantiated by clinical studies
- R&D spending in excess of \$2MM

Available at most retail outlets. For orders or additional information, contact:

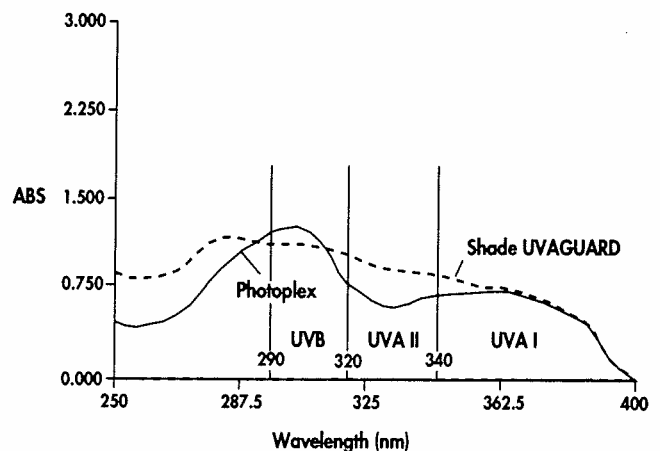


Forrest Shoemaker
 Director of Marketing & Sales
 Schering-Plough Healthcare Division
 839-4551 Ext. 221

Shade UVAGUARD™ vs. Current SPF 15 Lotion



Shade UVAGUARD™ vs. Photoplex®



New Ultraviolet Monitoring Technology

Douglas McG Clarkson M Phil, BSc*

Nick Grunfeld*

William J Hewak BSc**

There is a growing awareness of the hazards of ultraviolet (UV) radiation to the health of the community and to our environment's integrity. There is a need for monitoring this hazard. Until recently, UV radiation sensors tended to be relatively expensive. However, as a result of the introduction of mass-produced GaAs photodiodes in the late 1980s, UV radiation now can be measured more accurately, cost-effectively and conveniently. A new, low-cost sensor is available with a wavelength tailored to the skin's erythmal response without additional complex circuitry or filter elements; it can be used in a variety of settings.

Background

Sunlight's contribution to solar injuries and the development of skin cancer has been recognized since the beginning of the 20th century. While the photodamage spectrum traditionally has been considered as a set of conditions important for outdoor workers, it has become apparent over the past 2 decades that those who participate in outdoor recreation also are exposed to significant health risks.

The incidence of skin cancers has increased alarmingly over the past decade and forecasts anticipate an even more perilous epidemic. An important contributing factor to the epidemiologic shift of this disease has been the advent of economy-class air travel. In addition, the travel industry has furthered this outcome by advertising the "healthy tan", dismissing the warnings of dermatologists and ophthalmologists as alarmist.

In the past, concern about the negative effects of exposure to the sun focused on the UV-B wavelengths (290 to 320nm). Recently, however, it has become recognized that UV-A wavelengths (320 to 400 nm) should be monitored as well, for a more complete evaluation of sun-related health risks. Examples of this new concern already can be seen in the U.S., Canada, Europe and in other locations where sunscreens are formulated to provide UVA and UVB or broader-spectrum protection.

A heightened awareness of the risks of excessive UV exposure has been publicized through public health "safe sun" education campaigns and environmental concern over depletion of the stratospheric ozone layer. These influences together with the introduction of new UV-sensing and communications technology are in a timely position to help counter the present inattention to UV protection of one's person.

As part of the new focus on preventive medicine in the developed world, public health programs promoting safe-sun awareness are being established rapidly. It is well recognized that Australia and New Zealand have been the most active in this area, mainly the result of rapid escalation of skin cancer rates in those countries.

Two problems exist that make promoting safe-sun behavior a challenge: The invisibility of UV radiation and the often negative tone of the educational message. How people spend their leisure time is a personal and controversial subject. Whereas the public may be aware of the dangers of excessive exposure to the sun's rays, overly negative propaganda can result in undesired reactions.

Hence, 2 elements should exist in the effective delivery of a practice safe-sun message: The first is to make UV radiation a measurable entity that can be understood and related to easily. The second element is a message that has enough emphasis on the dangers of excessive exposure without presenting the sun as something to be avoided at all costs. The latter point especially is important in sunny places where people live or visit.

The problem of the invisibility of UV radiation has been overcome with the development of new technology that makes available accurate and affordable sensors to measure UV wavelengths important to the skin. This development promises to alter significantly sun-oriented attitudes and behaviors and promote personal UV protection.

Technology

The basic problem in providing accurate and affordable monitoring of the doses of UV radiation that affect the skin has been in the development of a low-cost sensor with a response that matches the reaction of the skin to sunlight. Conventional detector systems, using relatively bulky interface filter technology, provided solutions typically costing several thousand dollars.

The Environmental Monitoring Technology Ltd. (EMTEC), solution employs a miniature sensor that uses aspects of conventional semiconductor technology coupled with innovative optical technology—all at a dramatically lower cost. The response of the EMTEC sensor is closely matched to the known UVB-doses curve, including sensitivity to a UVA component, to best simulate the total effect of UV radiation on the skin. Innovative design geometry has achieved an excellent cosine correction factor which accurately detects radiation effects on the sensor from a wide range of angles. All of these features are essential for accurate monitoring of UV exposure. For these reasons, the EMTEC sensor is considered to be the founder of a new generation of UV monitoring equipment.

Applications

EMTEC's range of products incorporates its revolutionary sensor and has the flexibility to adapt to novel applications in

(Continued on page 146) ►

* EMTEC Ltd. (Environmental Monitoring Technologies, Ltd.)
University Station
2440 Campus Rd., Box UV
Honolulu, HI 96822

Reprints should be requested from:
** William J Hewak
University of Hawaii
Department of Geography
2424 Maile Way
Honolulu, HI 96822

Close at hand



THE QUEEN'S MEDICAL CENTER

A QUEEN'S HEALTH SYSTEMS COMPANY

Ozone Depletion: Causes, Potential Effects and Remedies

Bruce J Miller PhD
Scott P Bogle AB

The ozone layer functions as a protective screen, filtering out most of the sun's harmful ultraviolet (UV) rays. This protective layer is located in the stratosphere between 15km and 35km above the earth's surface. Ozone is actually a form of oxygen. In the lower atmosphere, oxygen atoms commonly bond with each other in pairs. This molecule, abbreviated as O₂, is the form of oxygen we need to breathe. Ozone is a more unstable and uncommon molecule made up of 3 oxygen atoms and is abbreviated O₃.

In addition to the stratospheric ozone layer, ozone also is found in the layer of the atmosphere closest to Earth, known as the troposphere. While the ozone layer in the stratosphere far above our heads protects us from UV radiation, ozone in the troposphere is harmful to breathe and damages crops and trees. Tropospheric ozone is formed by the reaction of sunlight with substances such as car exhaust and industrial chemicals and is often referred to as photochemical smog. Ozone in the troposphere provides some protection from UV rays, but its dangers far outweigh its benefits.

What is damaging the ozone layer?

The ozone layer is being attacked by man-made chemical compounds containing chlorine and bromine. The most common of these are chlorofluorocarbons (CFCs) and bromofluorocarbons (halons). Because of their stable chemical structure, these compounds don't break down in the lower atmosphere. They take 5 to 10 years to reach the stratosphere, where they are broken down by intense UV radiation¹. This breakdown releases atoms of chlorine (from CFCs) or bromine (from halons) that react with and destroy ozone. Each of these atoms is able to react repeatedly and destroy as many as 100,000 ozone molecules².

The evidence

Since 1985, scientists have been studying the ozone "hole" that forms every year over the South Pole during the Antarctic spring. Within this hole ozone levels are depleted by as much as 50% to 60%³. The size and duration of the hole continue to increase, opening earlier and closing later each year, exposing

an area larger than the United States to unusually high levels of UV radiation. In the last several years this depletion has extended to include southern Chile.

In 1991 a team of United Nations (UN) scientists found that not only is the ozone layer thinning over middle latitudes in both the northern and southern hemispheres, but that depletion is now also occurring during the summer. Up to that point, depletion had been recorded only during the colder winter months. Depletion over the United States now averages 3.5% in summer and reaches 5.5% in the winter, exceeding 5% into early June³.

In February 1992, NASA released data from its Second Airborne Arctic Stratospheric Expedition showing extremely high levels of ozone-depleting chlorine monoxide in the atmosphere over most of the northern United States, Canada, northern Europe, and Asia. Depending on weather conditions, this chlorine could cause temporary ozone loss of as much as 30% to 40% over these heavily populated areas during any given winter in the next several years⁴. The same press release reported ozone loss of up to 10% over tropical latitudes, including much of Hawaii, probably related to sulfate droplets in the volcanic plume from the 1991 eruption of Mt. Pinatubo in the Philippines. Scientists hypothesize that these sulfate droplets catalyze the destruction of ozone by chlorine⁵.

At present, predictions for future ozone-depletion over the remainder of the decade vary. At the conservative end, some scientists predict another 3% loss by the year 2000. Dr. Joe Farman, a British scientist who was one of the discoverers of the Antarctic ozone hole, projects roughly a 20% depletion over the United Kingdom and northern Europe⁶. This projection has been echoed by Dr. Sherwood Rowland, one of the scientists who, in 1974, first suggested that CFCs had the potential to damage the ozone layer. Between these high and low extremes, the United Nations Environmental Programme based its studies of the impact on the environment the result of ozone depletion as a sustained average of 10%⁷.

Banning the CFCs

The destruction of ozone by CFCs was first hypothesized in the early 1970s; this led to public outcry, a ban on their use in aerosols in the United States and a temporary decrease in their emissions. However, despite knowledge of their destructive capability, the usefulness of CFCs and halons in other areas led to huge increases in production through the mid-1980s. By the late 1980s, CFC and halon use was considerably higher than it had been prior to the aerosol ban in 1978⁸.

CFCs are used widely as refrigerants in air conditioners, refrigerators, freezers and heat pumps; as blowing agents for

* Hawaii Global Change Education Project
Hawaii Sea Grant Extension Service
School of Ocean & Earth Science & Technology
University of Hawaii

Reprints should be requested from:
Hawaii Sea Grant Extension Service
1000 Pope Road, MSB #226
Honolulu, HI 96822

some foam plastics; as solvents in the cleaning of metals and the manufacturing of electronics. Halons are used as agents in fire extinguishers in both large stationary systems designed to protect electronic equipment and in portable ones.

Other ozone-depleting chemicals include carbon tetrachloride, used primarily as a solvent; methyl chloroform (1,1,1-trichloroethane), used as a metal cleaner; and in various products such as spot removers, insecticides and shoe polish sprays. Methyl bromide has recently been found to be released by fungicides.

The United States is the world's largest producer and consumer of CFCs and halons, accounting for close to 30% of world production and use⁸. Since 1990, United States CFC production has been cut in half, but still has a long way to go. Because of their proven threat to our health and environment, we need to stop using these chemicals, and we can do this without lowering our standard of living (for information on how to reduce the use of these chemicals see the section entitled "Meanwhile what can we do?").

The alternatives

Many replacement chemicals now are available; others are being tested. Generally they are far less destructive to ozone, while being almost as efficient as those currently in use. Substitutes such as HFC-134a (used as a replacement refrigerant for CFC-12) and butane (used as a blowing agent) have no damaging effect on ozone; however, they still contribute to the greenhouse-warming effect. Many companies that used CFCs as solvents have successfully switched to alternatives, such as citrus extracts or even soap and warm water.

Refrigeration companies are developing appliances using helium, butane, and hydrogen as coolant gases. Other alternatives, such as hydrochlorofluorocarbons (HCFCs), are considered by many to be interim substitutes because their ozone-depleting potential is far lower than that of CFCs. Eventually these will need to be phased out as well, as some HCFCs may be more destructive to ozone than previously thought⁹.

Can the ozone layer repair itself?

Ozone is constantly being both created and destroyed in the stratosphere. The average life of an ozone molecule is relatively short and until recently ozone was being created at least as fast as it was being destroyed. Unfortunately, the chlorine and bromine compounds we have released into the atmosphere have altered this balance, and they are destroying ozone faster than it can be created. After emissions of these chemicals cease, the ozone layer will eventually repair itself. However, recent estimates indicate that even if we stop all CFC emissions today, depletion will continue to worsen for at least a decade before any repair can begin. For the same reason, the Antarctic ozone hole is estimated to not fully repair itself until the late 21st century³.

The effect of ozone depletion

Life as we know it on Earth developed under the protective shield of the ozone layer and has been sustained by this protection for nearly a billion years. Significant depletion of this shield will be harmful to both humans and other living things

on which we are dependent. Dangers from elevated levels of UV radiation include:

On human health:

- **Increased instances of skin cancer:** According to the United Nations Environmental Program (UNEP) *Environmental Effects of Ozone Depletion 1991 Update*, every 1% thinning of the ozone layer will result in approximately a 2.3% to 2.6% increase in non-melanoma skin cancer. This report, based on data from ongoing research by NASA and the international scientific community, predicted that a sustained 10% decrease in ozone will be associated with a 26% increase in non-melanoma skin cancer. All things being equal, this would result in an increase in excess of 300,000 cases per year world wide⁷.
- **Increased instances of cataracts, the leading cause of blindness in the U.S.:** The same UNEP report also predicted that, all things being equal, a sustained 10% decrease in ozone depletion will lead to between 1.6 and 1.75 million additional cataract cases a year worldwide⁷. UV also is associated with age-related nearsightedness and solar retinopathy, or eye burn, which can cause temporary blindness.
- **Weakening of the immune system:** Recent evidence indicates that while people with fair skin are most likely to suffer the brunt of increased skin cancers resulting from ozone-depletion, people of all skin types are at equal risk of the immunosuppressive effects of elevated UV radiation levels. Recent research cited in the 1991 UNEP report indicates that exposure to UV also can activate the HIV virus⁷.
- **Premature wrinkling, toughening and aging of the skin.**

On crops and other land plants:

- **Reduced crop yields and stunted growth of natural vegetation:** Plant groups sensitive to increases in UV radiation include beans, melons, peas, and cabbage. Soybeans, the third most important food crop in the U.S., have been found to be particularly sensitive to elevated UV levels. According to the 1991 UNBP report, a 25% reduction in ozone could cause a decrease in soybean production of up to 20%⁷.

On marine life:

- **Disruption of the marine food chain and further reduction of already shrinking fisheries:** Fish larvae and phytoplankton living near the ocean surface are harmed by exposure to increased levels of UV radiation. Phytoplankton account for 75% of marine plant mass and form the base of the marine food chain. Additionally, these organisms are important in the production of oxygen. Recent research in the Antarctic found a 6% to 12% reduction in primary productivity by marine phytoplankton, attributed to elevated UV levels under the Antarctic ozone "hole"⁹.

Aside from the studies cited above, there has been relatively little research on the impact of ozone depletion on terrestrial and marine ecosystems. While human beings can offset the effect of higher UV levels by adopting behavioral changes, this is not as easy for some other organisms to do. Increased

(Continued on page 122) ►

MAHALO!

TO THE THOUSANDS OF AMERICAN CANCER SOCIETY

VOLUNTEERS

VISITING NEIGHBORS THROUGHOUT HAWAII WITH THE MESSAGE:

PRACTICE



SAFE  SUN
HAWAII

MILLIONS KNOW:

**THERE'S NOTHING
MIGHTIER THAN THE SWORD**



This message brought to you as a community service by

EMTEC

Public and Personal UVA - UVB Sun Exposure Monitoring Systems

| | |
|--|------------------------|
| On Oahu: 949-1866 | EMTEC, LTD. |
| 1-800-77-EMTEC (Neighbor Islands) | University Station |
| 1-800-55-EMTEC (Mainland USA & Canada) | 2440 Campus Rd, Box UV |
| All telephones - 24 hours a day | Honolulu, HI 96822 |

EMTEC - A World Leader in Environmental Monitoring Technologies

THE AMERICAN CANCER SOCIETY SOCIETY STARTS A CAMPAIGN

(Continued from page 114)

Nearly 10,000 American Cancer Society volunteers will be knocking on neighbors' doors statewide in early May. At each household they will leave a kit filled with informative and attention-getting materials to emphasize the Practice Safe Sun message. The kit includes a Practice Safe Sun brochure with prevention and self-examination tips, the ABCD danger signs of melanoma, and other facts. Similar informational pieces will be used by the Society in a companion mailing to homes not reached by the door-to-door volunteers. Also to be included in the kits is a sample of SPF 15 (or higher) sunscreen. And, of course, to appeal to the younger set (not to mention their parents), each kit will contain a milk-bottle cap with the Practice Safe Sun theme.

For several years, members of the Hawaii Dermatological Society have been providing free skin-cancer screenings during May, which is national Skin Cancer Awareness Month.

This year Liberty House department stores statewide will provide space for the screenings on May 12 in a joint promotional effort. Liberty House stores hosting screenings are: Ala Moana Center, Pearlridge Center, Downtown, Windward Mall, Kailua, Kahala Mall, Maui, Kona, Hilo and Kauai.

As planning progressed this past winter and spring, many other activities were being developed. More than a dozen organizations are working together to make an impact for health on the people of Hawaii.

Summary

Dr. Goldstein has summed it up for the Hawaii Medical Association: "Because of the decrease in the ozone layer and the marked increase of melanomas and skin cancers, as well as sun-related cataracts and other environmental problems, we are very pleased that the American Cancer Society has decided to choose skin cancers/melanomas to alert our population to the dangers of excessive UV exposures."

The volunteers of the American Cancer Society hope that idea is developed and molded into something big enough to significantly reduce the incidence of skin cancer in Hawaii.

Introducing CETAPHIL™

Gentle Cleansing Bar



- The mildest cleansing bar available
- Specially formulated for dry, sensitive skin
- Moisturizes as it cleans

GALDERMA 

577-2363

Dedicated to Dermatology

SKIN CANCER THREATENS HIM.



PHOTOPLEX® PROTECTS HIM.

The Broadest UVA Absorption In A Moisturizing Sunscreen.

ALLERGAN Herbert Skin Care Division of Allergan, Inc. Irvine, CA 92713 ©1992 Allergan, Inc.
Photoplex® Broad Spectrum Sunscreen Lotion is a registered trademark of Allergan, Inc.

Distributed by: G & V Jaffe, Inc. • 526-3266
Gordy Somekawa, Yvonne Beaton

UV radiation is also only one of many pressures, along with loss of habitat, changing climate, and introduced species, placed on organisms and ecosystems by human-induced global change. In the face of uncertainty over the compound effect of these pressures, we must take whatever steps we can to minimize depletion of the ozone layer.

What we can do

Depletion of the ozone layer is a global problem. It stands to affect all people in all parts of the world. Solving the ozone problem requires action and cooperation from world organizations, national, state and local governments, industry, and individuals.

The role of government

The U.S. is one of approximately 70 nations that signed the Montreal Protocol on Substances that Deplete the Ozone Layer. This 1987 UN treaty called for a 50% reduction from 1986 levels in CFC production and a freeze on the production of halons. In London in 1990 these provisions were strengthened to require a complete phase-out of CFCs and halons by 2000, with the elimination of methyl chloroform and carbon tetrachloride by 2005 and 2000 respectively. The 1990 revisions of the U.S. Clean Air Act call for a similar phase-out schedule, while also providing some regulation in areas not covered by the Protocol².

Since 1990, these phase-out dates have shifted in response to information provided by ongoing research. In 1992 the U.S. government followed the lead of many European countries by announcing an acceleration of the phase-out schedule for CFCs and carbon tetrachloride. Production of these chemicals now will cease by December 1995. Halon production will be eliminated in 1994. These same phase-out dates were adopted later in the year by the other parties of the Montreal Protocol, while the European Community upped the ante by agreeing to stop producing CFCs by January 1995¹⁰.

These are all important steps and should be applauded. In the coming years similar policies that are responsive to new research findings will need to be developed to address other environmental threats as well. However, we should remember that international agreements and federal regulation are only part of the solution. Until CFCs, halons and other ozone depleters are finally phased out there are other steps that can be taken to prevent unnecessary emissions of these chemicals. As was mentioned earlier, many companies are finding ozone-safe substitutes and switching over to them in advance of the dates required by law. Several state governments also have taken action. Hawaii was the first state in the nation to mandate recovery and recycling of CFCs used in car air-conditioners and to ban over-the-counter sales of the chemicals. Vermont, Oregon, Florida, Maine and Minnesota followed suit.

Meanwhile what can we do?

The 1990s have been called the decade of individual responsibility. We as individuals can make a difference with the products we use and the choices we make. When the threat to ozone posed by CFCs in aerosol sprays was first reported in the 1970s, American consumers simply stopped buying aerosols once they learned of the danger these sprays posed to

the ozone layer. This action prevented large amounts of CFCs from being released into the atmosphere and led to a government ban on CFC use in aerosol products. Here are steps that individual consumers can take today to protect the ozone layer:

- 1) Leaking car air-conditioners have traditionally been the largest source of CFC emissions in the United States. Both federal and state laws require service stations to recover and recycle CFCs when air-conditioners are repaired, but there has been little enforcement of these measures. Therefore:
 - Make sure your service station recycles CFCs before you have your air-conditioner repaired.
 - If you are buying a new car, consider a model without an air-conditioner or one using new non-depleting refrigerants.
- 2) Avoid foam containers and packaging such as foam popcorn unless they indicate that they were not made with CFCs or HCFCs. Not only do some of these contain ozone-depleting chemicals, but they are also a problem in disposal of waste. As of February 1989, most polystyrene manufacturers stopped using the most destructive CFCs, but some of the replacements, especially HCFC-22, have been found to be more damaging than previously thought.
- 3) Immediately repair any leaks in your refrigerator. If you are discarding a refrigerator, make sure the CFCs are recycled before it is scrapped. If you are buying a refrigerator, consider new CFC-free models.
- 4) Avoid purchasing halon fire extinguishers. These usually can be identified by the yellow canister. Traditional dry chemical or carbon dioxide models will work in most cases. The sale of most portable halon fire extinguishers will be prohibited in Hawaii beginning in July 1993. Call your local fire department for information; if you already own a halon extinguisher, store it until halon recycling is available.
- 5) Consider alternatives to air-conditioning in your home. If you are building a home, look into passive cooling designs. For an existing home, consider the following options:
 - Insulate to keep heat out.
 - Install a cooling system using fans.
- 6) Check all products before purchase to avoid ozone-depleting chemicals. These chemicals include: CFC-11, CFC-12, CFC-113, CFC-114, CFC-115, (The abbreviation CFC will sometimes be replaced by R for "refrigerant", i.e. R-11, R-12, R-113, etc.); Halon-1211, Halon-1301, Halon-2402, 1,1,1-trichloroethane (methyl chloroform), and carbon tetrachloride are also to be avoided.
- 7) Write to your federal, state and local government representatives and inform them of your concern about ozone depletion.

Global problems such as ozone depletion can seem huge, abstract, and impersonal, but just as we each stand to be affected by these problems, we can each make a difference. Talk about this and other global change issues with your family, friends, and colleagues, and follow the steps listed above that you as an individual can take to reduce ozone depletion.

(Continued on page 131) ►

As seen in
THE SKIN CANCER
FOUNDATION JOURNAL

Skin cancer protection starts here.

The UV-Biometer™

Concern is growing about thinning atmospheric ozone and the increased skin cancer risk from sun exposure. Researchers, physicians and government officials want to know how much more UV radiation is reaching the earth's surface, to better protect the public's health.

For precise measurements of biologically effective ultraviolet radiation, start with the Model 501 UV-Biometer™ from Solar Light Company.

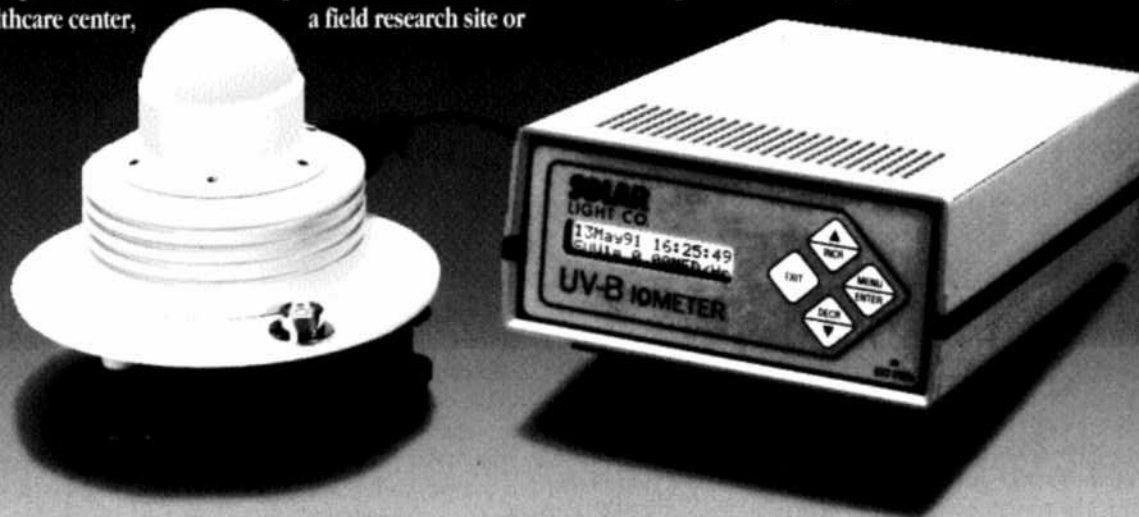
The UV-Biometer has a spectral response that parallels the sunburn response of human skin. It measures the biological effectiveness of UV radiation in MED/HR (Minimum Erythema Dose per Hour)—measurements strongly correlated to solar radiation effects such as sunburn, skin cancer, skin aging, and cataracts.

The UV-Biometer belongs wherever the sun can affect public health—whether as part of a community healthcare center, a field research site or

a regional network of UV monitoring stations. Furthermore, with a UV-Biometer on your facility's roof beneath an open sky, your organization can gain stature by obtaining and providing timely UV reports sought by the media and the public.

This precision instrument is the latest in a line of quality UV meters and solar simulators that our company has engineered for science and industry since 1967.* Our instruments have helped develop the SPF testing industry, and now the majority of cosmetics companies use our equipment. Today Solar Light casts a shadow that's 25 years long as a pioneer in the UV measurement field.

There's no cover from the realities of ozone thinning and UV radiation risks. It's time to make Solar Light Company and the UV-Biometer your partners in all skin cancer protection strategies under the sun.



- Temperature stabilized detector for accuracy
- Quartz dome for excellent cosine response
- Noise-free digital output to recorder, optional printer, PC or data logger
- Ultra-stable and rugged weatherproof construction
- Rechargeable battery back-up safeguards against power outage
- Nonvolatile data buffer holds over 3 months of half-hour dose readings

*For further information and details on a
free remote trial of the UV-Biometer, contact:*

**The UV-Biometer is a state-of-the-art updating of the pioneering Robertson-Berger Weatherproof Sunburn UV Meter used for the Temple University UV global network since 1973.*

SOLAR
LIGHT CO. INC.

The Gender-Related Issues in Malignant Melanoma

Darrell S Rigel MD, FAAD*

The problem of malignant melanoma is important in the United States, in the world as a whole, and particularly in Hawaii with its high levels of ultraviolet radiation. It is estimated that 32,000 Americans will develop melanoma and 6,800 will die of this tumor in 1993. Melanoma is now the seventh most frequent cancer in the United States. It is more common than ovarian, cervical, CNS cancer and leukemia¹.

Both incidence and mortality from melanoma are rapidly increasing. The incidence of melanoma has consistently increased 6% a year and the death rate has increased 2% a year since 1950. At current rates, one in 400 will die of this tumor. Should this rate of increase continue, by the year 2000, it is estimated that one in 75 Americans will develop melanoma during a lifetime. The highest melanoma incidence in the U.S. is found in Hawaii. Melanoma is increasing faster than any other cancer in the United States and all over the world².

Gender-specific epidemiologic issues

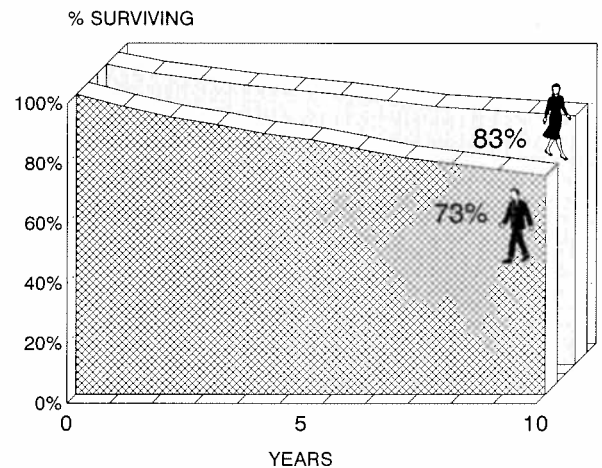
Most studies show an overall slight preponderance of men over women developing melanoma. The rate of melanoma is increasing most rapidly in persons under the age of 40. Women predominate with a 3:2 ratio from ages 20 to 29 and a 2:1 ratio from ages 30 to 39. Melanoma is currently the most frequent of all cancers in women ages 25 to 29, and second (after breast cancer) in women ages 30 to 34.

Above the age of 40, these curves cross with more men developing melanoma than women. By age 80, men outnumber women almost 2:1 in terms of developing this cancer. Similar findings are being noted worldwide. The reasons for these differences in gender-incidence are as yet unknown.

Prognostic factors

The most important factor that influences survival in persons with melanoma is how deep the lesion has penetrated into the skin. A small difference in tumor thickness can be critical. Almost all persons with melanoma less than 0.75 mm (1/32) will survive while less than half will survive when the lesion is greater than 3.0 mm (1/8 inch) in thickness. Other factors that influence survival include whether the tumor is localized or has spread (stage), if it is eroded and/or has bled (ulceration), and where on the body it is located (anatomic site).

There are significant differences in survival in men versus women who have developed melanoma. After correcting for other prognostic factors, women have a significantly improved 5- and 10-year survival over men. Data from 1,143 melanoma patients from New York University Melanoma Cooperative Group show a 10-year survival of 83% in women versus 73% in men. (Figure 1) This finding of differences in survival by gender are supported by many other studies in the United States and worldwide.



NEW YORK UNIVERSITY MELANOMA COOPERATIVE GROUP 1993

Figure 1: Comparison of 10-year survival in male and female patients. New York University Cooperative Group unpublished data.

Several reasons have been proposed for this difference in survival by gender. First, melanoma is a cancer that is hormonally influenced. Progesterone and estrogen may favorably influence in persons with this tumor. Second, men most often develop their melanoma on the upper back while women often experience lesions on their legs. The difficulty in seeing melanoma arising on the back may result in a delay in diagnosis³. In fact studies have suggested that men tend to delay seeing a physician for evaluation of a suspicious lesion as compared to women. This delay lets the melanoma progress resulting in thicker, more often ulcerated tumors that may be more likely to have spread prior to the initial visit to the doctor. These factors would also contribute to a lower rate of survival in men.

Trends in mortality for melanoma also show gender-specific findings. The overall death rate for melanoma in the United States is now 2.7 per 100,000. However, the rate in men is 3.2 per 100,000 versus 2.2 per 100,000 in women. Data from the

* Clinical Associate Professor
Ronald O. Perelman Department of Dermatology
New York University Medical Center
New York, NY 10016

(continued on page 146)▶

The Hawaii Dermatological Society

wishes to thank the American Cancer Society for its support of educational projects warning Hawaii's population about the dangers of over exposure to the sun.

SOCIETY MEMBERS

- | | |
|--------------------------------|-------------------------------|
| Milton J. Ackerman, M.D. | Douglas W. Johnson, M.D. |
| Samuel D. Allison, M.D. (Ret.) | Robert Kim, M.D. |
| David Amberger, M.D. | Tim Knight, M.D. |
| J.D. Atkisson, M.D. | Bradley Lau, M.D. |
| Stephanie Chew, M.D. | Frederick F. Maag, M.D. |
| Bruce B. Chrisman, M.D. | George M. Martin, M.D. |
| Douglas Chun, M.D. | Stella Matsuda, M.D. |
| Clement Chun-Ming, M.D. | Janice Matsunaga, M.D. |
| Richard W.M. Dang, M.D. | Bruce Mills, M.D. |
| David Elpern, M.D. | Randy Mita, M.D. |
| Edward T. Emura, M.D. | Carla Nip-Sakamoto, M.D. |
| Richard W. Fardal, M.D. | Scott Norton, M.D. |
| Jennifer Fong, M.D. | Daniel D. Palmer, M.D. (Ret.) |
| Wayne H. Fujita, M.D. | Klaus Rennert, M.D. |
| Roman Glamb, M.D. | Curtis Samlaska, M.D. |
| Alan P. Goldstein, M.D. | Christopher Schmidt, M.D. |
| Norman Goldstein, M.D. | Robert Shapiro, M.D. |
| Jay L. Grekin, M.D. | Jenny Stone, M.D. |
| Timothy Hagino, M.D. | Ned Stoughton, M.D. |
| Philip D. Hellreich, M.D. | Paul Sunahara, M.D. |
| Gregory J. Herbich, M.D. | Paul Takiguchi, M.D. |
| David Huntley, M.D. | Carver Wilcox, M.D. |
| Allan K. Izumi, M.D. | William Wong, M.D. |

For more information, write or call:
1360 South Beretania Street, 2nd Floor
536-7702

Skin Cancers in Hawaii (1993)

Norman Goldstein MD, FACP*

Basal cell cancers are the most common of all cancers. They rarely metastasize and very rarely kill. Melanomas, however, do kill! An estimated 20 people in Hawaii will die this year from malignant melanoma. Early diagnosis and treatment can save much morbidity—surgery, scars and other defects—and can save lives. This manuscript reviews melanoma data from several agencies in Hawaii and from the experience of the author's private practice. In his private practice, he has seen the incidence of melanomas jump from an average of one a year in 1970 to 1975 to 7.4 each year between 1986 and 1990. While basal cell cancers and melanomas occur more in Caucasians, they are seen in all races. Everyone can get skin cancer and melanoma. Physicians must teach their patients to Practice Safe Sun—Hawaii.

Basal cell cancers, the most common type of all skin cancers, are not reportable to any state or national recording agency. The American Cancer Society projects more than 700,000 new cases of basal and squamous cell cancers in 1993¹.

Stone and Elpern, Hawaii dermatologists, and their associates did a very thorough study of non-melanomas on the island of Kauai between January 1, 1983 and December 31, 1983². In their review of 131 Kauai residents with non-melanoma skin cancers, 89 had basal cell cancers and 24 had squamous cell carcinomas (5 had melanomas). The ethnic distribution was as might be expected.

| Ethnic Group | Basal Cell Cancer | Squamous Cell Cancer |
|---------------|-------------------|----------------------|
| Caucasion | 80 | 19 |
| Japanese | 7 | 4 |
| Filipino | 1 | 1 |
| Part Hawaiian | 1 | 0 |
| Totals | 89 | 24 |

* Clinical Professor, Medicine (Dermatology)
John A Burns School of Medicine
University of Hawaii

Send reprint requests to:
Norman Goldstein MD FACP
1128 Smith Street, Honolulu, HI 96817

The authors also clearly showed the incidence of non-melanoma skin cancers on Kauai to be significantly higher than anywhere on the Mainland. The age-adjusted incidence for basal and squamous cell carcinoma was over twice that of New Orleans, 2.5 times that of New Mexico, and 5 times that of Seattle.

Dermatologists, plastic surgeons and pathologists agree that basal cell cancer is the most common of all cancers. Fortunately these rarely metastasize but do invade locally if untreated; hence, the old name "rodent ulcer." Deaths from basal cell cancers are very, very rare.

Melanomas, on the other hand, do kill. The American Cancer Society estimates 6,800 deaths from melanoma (4,200 male and 2,600 female) in 1993. They also estimate a total of 32,000 (17,000 male and 15,000 female) new melanomas will be diagnosed in the United States this year. Hawaii will have 70 of them, with 20 deaths!

Despite the fact that the number of melanoma deaths in Hawaii is relatively low compared to 425 lung cancer, 200 colon and rectal cancer, 100 breast cancer and 100 prostate cancer deaths, many of these melanoma deaths could be prevented with early diagnosis and treatment. This article will review the melanoma data from several sources in Hawaii:

- Queen's Medical Center (QMC)—Oncology Data Registry
- Cancer Research Center of Hawaii (CRCH)—Epidemiology Program
- Hawaii Medical Association — Hawaii Tumor Registry (HMA-HTR)

Between 1960 and 1961, The QMC Oncology Registry recorded 224 melanoma cases (141 male and 83 female). By far the largest ethnic group was Caucasian, 182 (81.3%); Hawaiian, Filipino and Japanese (11,10 and 9% respectively); Chinese 3 and others 9. The highest age groups with diagnosed melanoma were at 50 to 59 years (52 patients) and 60 to 69 years (55 patients). It should be noted that 4 patients out of the total were 19 years of age or younger, and 14 were aged 20 to 29 years.

The latest data available at this time at QMC indicate 4 more melanomas in the first 6 months of 1992 (2 Caucasian, 1 Hawaiian/part-Hawaiian, and 1 other). There were 3 females and 1 male. In summary, 142 male and 86 female patients were registered between 1960 and mid-1992 at The Queen's Medical Center Registry.

CRCH

LeMarchand and his associates in the Epidemiology Program of the Cancer Research Center of Hawaii have the largest data base of melanoma patients in the State. As part of

their dietary studies relating to cancer, they have examined 500 melanoma patients between January 1986 and June 1992. There were 306 males and 194 females in their study:

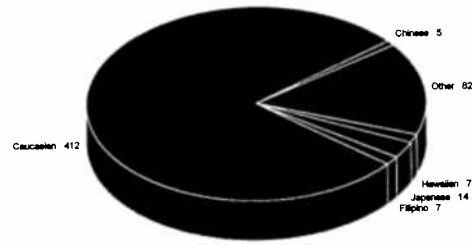
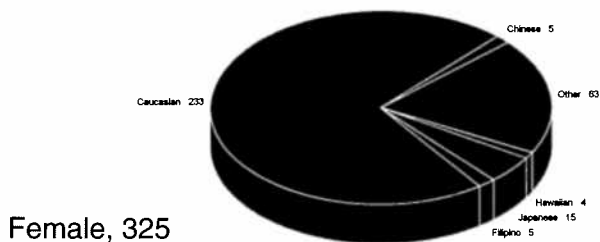
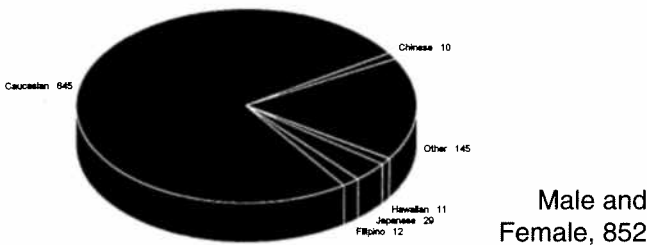
| Ethnic Group | Male | Female |
|------------------------|------|--------|
| Caucasian | 279 | 174 |
| Hawaiian/Part Hawaiian | 12 | 7 |
| Japanese | 8 | 6 |
| Chinese | 3 | 5 |
| Filipino | 1 | 2 |
| Unknown | 2 | 0 |
| Other | 1 | 0 |
| Totals | 306 | 194 |

HMA-Hawaii Tumor Registry

HMA-HTR is supported by the American Cancer Society, Hawaii Pacific Division, the Cancer Research Center at the University of Hawaii John A Burns School of Medicine and by the State Department of Health. HMA-HTR recorded 852 melanomas diagnosed between 1985 and 1991. In this 7-year period there were 527 males and 325 females. As anticipated, the majority were Caucasians (645) with 412 males and 233 females; the data clearly indicates other racial groups do get melanomas in Hawaii.

Regrettably there were 137 unknown races, but most can be assumed to be Caucasian. The complete data from the HTR include 15 different types of histologic codes for the 852 melanomas. This will be reported elsewhere.

Melanoma in Hawaii
1985 to 1991



Male, 325

Two rare but very significant types of melanomas deserve special mention here: there were 6 amelanotic melanomas (5 Caucasian and 1 Hawaiian). These are melanomas without the melanoma color, ie had normal skin color.

There were also 4 acral lentiginous melanomas: 3 in Filipino men and 1 in a Hawaiian. These usually are seen on the sides of the sole of the foot in members of the dark-skinned races.

The worldwide increase of cutaneous malignant melanoma is rising faster than any other cancer³. But as Koh et al⁴ have noted, most registries record data from patients admitted to hospitals and/or from biopsies interpreted in hospital-based laboratories.

This study clearly shows that Hawaiians and part-Hawaiians are developing melanomas.

Melanoma data from a private dermatology practice

In preparation for the "Practice Safe Sun—Hawaii" campaign for the American Cancer Society Hawaii Pacific Division, we were asked to review our melanoma cases.

During the years 1972 to 1993, we practiced Dermatology in downtown Honolulu; we have always seen a wide diversity of ages, ethnic groups and occupations. We were seeing more patients with melanoma over the years but the actual data really astounded us.

| Ethnic Group | Male | Female |
|--------------|------|--------|
| 1969 | 2 | 2.0 |
| 1970-1975 | 5 | 1.0 |
| 1976-1980 | 19 | 3.8 |
| 1981-1985 | 20 | 4.0 |
| 1986-1990 | 37 | 7.4 |
| 1991-1992 | 11 | 5.1 |

Some of these melanoma cases were diagnosed and treated by either oncological or plastic surgeons in Hawaii or on the Mainland and were referred to us for follow-up. About 80% were diagnosed in our office.

There were 56 male and 38 female patients; of the 94 patients examined, 87 still are living, 5 males and 2 females have died. As expected, the racial rainbow of skins included a vast majority of Caucasians (86); 4 of Japanese ancestry, 2 Chinese, one Latin-American and one Hawaiian.

(continued)➤

YOCON®

YOHIMBINE HCl

Description: Yohimbine is a 3a-15a-20B-17a-hydroxy Yohimbine-16a-carboxylic acid methyl ester. The alkaloid is found in Rubiaceae and related trees. Also in Rauwolfia Serpentina (L) Benth. Yohimbine is an indolalkylamine alkaloid with chemical similarity to reserpine. It is a crystalline powder, odorless. Each compressed tablet contains (1/12 gr.) 5.4 mg of Yohimbine Hydrochloride.

Action: Yohimbine blocks presynaptic alpha-2 adrenergic receptors. Its action on peripheral blood vessels resembles that of reserpine, though it is weaker and of short duration. Yohimbine's peripheral autonomic nervous system effect is to increase parasympathetic (cholinergic) and decrease sympathetic (adrenergic) activity. It is to be noted that in male sexual performance, erection is linked to cholinergic activity and to alpha-2 adrenergic blockade which may theoretically result in increased penile inflow, decreased penile outflow or both.

Yohimbine exerts a stimulating action on the mood and may increase anxiety. Such actions have not been adequately studied or related to dosage although they appear to require high doses of the drug. Yohimbine has a mild anti-diuretic action, probably via stimulation of hypothalamic centers and release of posterior pituitary hormone.

Reportedly, Yohimbine exerts no significant influence on cardiac stimulation and other effects mediated by B-adrenergic receptors, its effect on blood pressure, if any, would be to lower it, however no adequate studies are at hand to quantitate this effect in terms of Yohimbine dosage.

Indications: Yocon® is indicated as a sympatholytic and mydriatic. It may have activity as an aphrodisiac.

Contraindications: Renal diseases, and patient's sensitive to the drug. In view of the limited and inadequate information at hand, no precise tabulation can be offered of additional contraindications.

Warning: Generally, this drug is not proposed for use in females and certainly not be used during pregnancy. Neither is this drug proposed for use in pediatric, geriatric or cardio-renal patients with gastric or duodenal ulcer history. Nor should it be used in conjunction with mood-modifying drugs such as antidepressants, or in psychiatric patients in general.

Adverse Reactions: Yohimbine readily penetrates the (CNS) and produces a complex pattern of responses in lower doses than required to produce peripheral a-adrenergic blockade. These include, anti-diuresis, a general picture of central excitation including elevation of blood pressure and heart rate, increased motor activity, irritability and tremor. Sweating, nausea and vomiting are common after parenteral administration of the drug.^{1,2} Also dizziness, headache, skin flushing reported when used orally.^{1,3}

Dosage and Administration: Experimental dosage reported in treatment of erectile impotence.^{1,3,4} 1 tablet (5.4 mg) 3 times a day, to adult males taken orally. Occasional side effects reported with this dosage are nausea, dizziness or nervousness. In the event of side effects dosage to be reduced to ½ tablet 3 times a day, followed by gradual increases to 1 tablet 3 times a day. Reported therapy not more than 10 weeks.³

How Supplied: Oral tablets of Yocon® 1/12 gr. 5.4 mg in bottles of 100's NDC 53159-001-01 and 1000's NDC 53159-001-10.

References:

1. A. Morales et al., *New England Journal of Medicine*: 1221, November 12, 1981.
2. Goodman, Gilman — *The Pharmacological basis of Therapeutics* 6th ed., p. 176-188. McMillan December Rev. 1/85.
3. *Weekly Urological Clinical letter*, 27:2, July 4, 1983.
4. A. Morales et al., *The Journal of Urology* 128: 45-47, 1982.

Rev. 1/85



AVAILABLE AT PHARMACIES NATIONWIDE

**PALISADES
PHARMACEUTICALS, INC.**

219 County Road
Tenafly, New Jersey 07670
(201) 569-8502
1-800-237-9083

SKIN CANCERS IN HAWAII (1993)

(Continued from page 127)

What Do These Statistics Mean?

According to the Skin Cancer Foundation, the death rate from malignant melanoma has more than doubled since 1950¹. Given the current life expectancy of persons and the increasing rates of malignant melanoma, it is estimated that 1 out of 200 Caucasians living in the U.S. in the year 2000 will have a melanoma.

However, as we have seen by the above data, melanomas are not the private domain of the Caucasian. All races are susceptible to melanomas, basal cell cancers and squamous cell carcinoma.

With early diagnosis and proper treatment, the diagnosis of melanoma need not be a death warrant. Hawaii physicians must be aware of the clinical characteristics of melanoma, basal cell and squamous cell cancers. They must help their patients become a part of the health team. Patients must be given brochures to teach them to look for the early signs of melanomas and skin cancers.

Brochures with excellent color photographs are readily available from the American Cancer Society, The Skin Cancer Foundation, The Skin Phototrauma Foundation and from members of the Hawaii Dermatological Society.

Patients must be taught that the regular daily use of sun protectives with an SPF of 15 or higher not only will reduce the aging effects of the sun in Hawaii, such as wrinkles and actinic keratoses, but will reduce the chances of getting skin cancer and melanoma. Children who are taught to brush their teeth on a regular basis should also be taught to put on sunscreen every morning.

Avoidance of noontime outdoor activities is a must for residents and visitors alike. There are dozens of activities that can be enjoyed indoors during the peak ultraviolet-ray exposure hours of 10 AM to 3 PM. Protective hats and lightweight garments now are readily available if patients must be out in the open at "high noon."

We should not scare our residents and tourists away from the beaches and the great outdoor activities in Hawaii, but we must educate them to enjoy these activities—in moderation and with common sense.

We must "Practice Safe Sun—Hawaii."

ACKNOWLEDGEMENTS

Beth Myers, Cancer Research Center of Hawaii
Ruth Merz and Michael Green, Hawaii Health Registries
Ethel Masui, Queen's Oncology Data Registry
Lois Chinen, Stacy Olson, Gin Davila, Lana Lazaro, Anna English, Alice Greer, Eve Dagdag, Miyo Deal, Merle Stetser, and Russ Sowers.

REFERENCES

1. CA Cancer. *J Clin Cancer Statistics*. Atlanta, Ga. 1993: American Cancer Society. 1991;43:7-26.
2. Stone J L et al. Incidence of non-melanoma skin cancer in Kauai. *HMJ*. Dec 1983;45:281-286.
3. Glass A, Hoover R. The emerging epidemic of melanoma and squamous cell skin cancer. *JAMA*. 1989;(262 or) 286: 2097-2100.
4. Koh, H K, Clapp, R W, Lew, R A. Implication of under-reporting of cutaneous malignant melanoma in Massachusetts. *The Melanoma Letter*. Skin Cancer Foundation, 1991;Vol. 9,1: 3-4.
5. Day C L, Rigel, D S. *Melanoma Letter*. The Skin Cancer Foundation.1991;J. No. 1, 1.

CARTER PROFESSIONAL CENTER

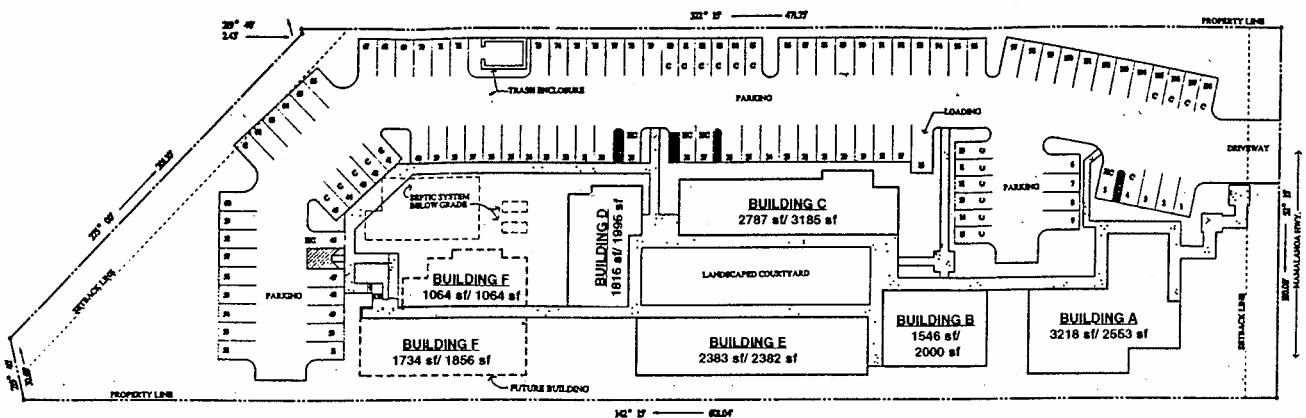
The Alternative to Leasing in Kamuela



Central Business District of Kamuela, Hawaii

Environs Pacific is fortunate to be the exclusive sales agent for the Carter Professional Center on the Big Island. For you that believe your business has a future on the Big Island, discover the benefits of leasing versus purchasing your office space. Call us now for more information about this unique real estate investment opportunity.

- ◆ **FEE Simple Condominium Office Complex**
- ◆ **Prices starts at \$200.00 per square foot**
- ◆ **Space available from 560 sq. ft. to 1708 sq. ft.**
- ◆ **Perfect for a 1031 Exchange**



Philip K. White & Associates
Architect

Keauhou Kona Resort Construction (KKRC)
Contractor

Environs Pacific
Exclusive Sales Agent

Marc E. Duncan
President, Project Manager, Realtor

Environs Pacific
Specializing in
Real Estate Development,
Land Use Planning
& Resource Studies

P.O. Box 2045
Kamuela, Hawaii 96743
885-4623

Surgical Treatment of Melanoma

Scott Hundahl MD, FACS, FSSO*

"Malignant melanoma writes its message in the skin with its own ink ... some see, but do not comprehend."¹ Effective treatment of melanoma begins with early recognition. Paranoid suspicion of any irregular, pigmented, nodular or ulcerated dermal lesion, when coupled with excisional biopsy, merits approbation even though many such lesions prove benign.

Biopsy

In addressing controversial aspects of biopsy, infiltration of tissue with local anesthetic around a melanoma jeopardizes neither local control nor survival². Similarly, a delay of treatment for as much as 4 weeks following even incisional biopsy fails to alter local control or prognosis. Shave biopsies of melanomas should be avoided, as this technique interferes with accurate depth assessment and makes appropriate treatment selection nearly impossible.

Primary excision

Historical recommendations concerning margins of excisions in the treatment of primary melanoma seem largely a function of surgical tradition rather than science. In collected, retrospective series, local recurrence following primary surgical treatment approximates 3%⁷. Presence of risk factors such as ulceration of the primary tumor thickness > 4 mm, or location in the hand, foot or scalp has been reported as increasing local recurrence rates to 10% or more. A prospective study of 612 patients with non-ulcerated extremity melanoma < 2mm in depth, randomized to 1 cm versus 3 cm excision margins, failed to detect any significant difference in local control or survival. All 4 patients with local recurrence in this study underwent excision with 1 cm margins, however, and all had melanomas thicker than 1 mm; 2 of the 4 died of disease⁸. Thus, while 1 cm margins seem fine for < 1 mm thick melanomas, thicker lesions may warrant wider excision. An ongoing, prospective, randomized intergroup trial, in patients with non-ulcerated melanomas 1 mm to 4 mm thick, comparing primary excision with 2 cm margins versus 4 cm margins, should clarify this issue.

Tradition dictates primary excision of melanomas en bloc with the underlying superficial muscular fascia. Olsen's view that resection of fascia might allow dissemination from subdermal lymphatics⁸ prompted some to abandon this tradition. In a retrospective, non-randomized comparison, both local recurrence and survival in 107 patients with melanoma excised en bloc including underlying fascia, closely matched that in 95 patients whose underlying fascia was left undisturbed. Fascial excision can probably be done safely only in those with thicker melanomas.

* Assist. Prof. of Surgery
Assist. Prof. of Clinical Research
Cancer Research Center of Hawaii
1236 Lauhala Street
Honolulu, Hawaii 96813

Therapeutic treatment of involved lymph nodes

In a group of 1,134 patients undergoing therapeutic lymphadenectomy for pathologically involved regional lymph nodes, Morton and colleagues report 5-, 10-, and 15-year survival rates of 46%, 41%, and 38% respectively. Multivariate analysis of this large group demonstrates that an increasing number of involved nodes, greater Breslow thickness of the primary, and torso, head or neck location all independently decrease survival. Male gender and degree of involved nodal enlargement impact the result adversely with borderline statistical significance¹⁰. Patients with only 1 positive node enjoy 5-year survival of 79%¹⁰. Contrary to prevailing opinions that patients with involved nodes inevitably harbor occult distant metastases, results indicate a surprising proportion can be cured by means of a radical regional procedure. Radical lymphadenectomy remains the mainstay of treatment in such patients.

Some patients present with regional lymph node involvement without a detectable primary lesion. Overall survival of these patients following regional lymphadenectomy approximates that in patients in whom one can identify a primary¹¹.

Elective lymphadenectomy

After 2 prospective, randomized trials of elective lymphadenectomy versus observation (with therapeutic lymphadenectomy if indicated) failed to reveal any significant difference in 10-year survival, most surgeons abandoned unselective, routine, elective lymphadenectomy in melanoma patients¹²⁻¹⁴. Balch, analyzing biologic risk of both nodal and distant metastases according to thickness of the primary lesion, emphasizes that, while benefit seems unlikely in both those with relatively thin melanomas, ie low risk of lymph node involvement, and in those with advanced, thick melanomas >4mm deep, ie high risk of systemic spread—the so-called “intermediate subgroup”—at high risk for occult nodal disease but at lower risk for occult systemic metastases, might indeed benefit from elective lymphadenectomy¹⁵. Analyzing data from both large retrospective, and prospective, randomized lymphadenectomy series, Balch identified apparent survival advantage in this variably defined “intermediate subgroup”¹³.

To further evaluate elective lymphadenectomy in this subgroup, patients were added to an ongoing intergroup trial of 1-mm to 4 mm-thick melanomas, underwent secondary randomization: Elective lymphadenectomy versus observation. Results of this trial should finally lay to rest any residual controversy concerning elective lymphadenectomy.

An alternate approach to elective nodal surgery in melanoma patients with nonpalpable nodes, pioneered by Morton and colleagues, involved selecting patients for lymphadenectomy based on results of dye-directed biopsy of sentinel nodes; if such sentinel nodes harbor microscopic disease, lymphadenectomy is performed¹⁶. Given the reality of “skip”

(Continued on page 132) ►


OZONE DEPLETION: CAUSES, POTENTIAL EFFECTS, AND REMEDIES (continued from page 122)

REFERENCES

1. Rowland, F S. Stratospheric Ozone Depletion. *Annual Review of Physical-Chemistry*. 1991. 42:731-78.
2. Office of Interdisciplinary Earth Studies/NOAA Office of Global Programs. Reports to the Nation: Our Ozone Shield. Fall 1992.
3. WMO/UNEP/NASA/NOAA. Scientific Assessment of Ozone Depletion: 1991. December 1991.
4. *New York Times*. 2/4/92. P.C4. Statement by M. Kurylo of NASA.
5. NASA Press Release. 2/3/92.
6. *International Environmental Reporter*. 2/26/92. P.95.
7. United Nations Environmental Programme. Environmental Effects of Ozone Depletion: 1991 Update November 1991.
8. The Environmental Policy Institute. Saving Our Skins: Technical Potential and Policies for the Elimination of Ozone-Depleting Chlorine Compounds. September 1988.
9. Smith RC, Prezelin KS, et al. Ozone Depletion: Ultraviolet Radiation and Phytoplankton Biology in Antarctic Waters. *Science*. 1992. 255:952-952.
10. Global Environmental Change Report. 12/18/92. V. 4, No. 24, P. 4.


15,000 PARTICIPANTS LISTEN TO BOB...

BOB KNOWS 401(K)



- He can help you retain good employees through quality plan management.
- He makes plan administration simple for you, and plans are very cost effective.
- Find out why 15,000 local people are participating in our retirement plans.



BOB HAMILTON & ASSOCIATES
Retirement Plans Specialist

 Aetna Life Insurance and Annuity Company
Ala Moana Pacific Center, 1585 Kapiolani Blvd. Ste. 1445
942-7702 Bob Hamilton, CLU

WE COLLECT DELINQUENT ACCOUNTS

Last year we collected more than \$2,000,000 for our clients.

BUREAU OF CONSUMER ECONOMICS


(808) 536-9691
Serving Hawaii business since 1953

C.Y.B.S.O.Y.B.

(Check Your Birthday Suit on Your Birthday)

Good Advice, Dr. Goldstein!

We specialize in birthday suits at the Center for Cosmetic Surgery. If you need any alterations in yours, call us about Lipo-Sculpture at 545-2800.



Center for Cosmetic Surgery
677 Ala Moana Blvd., Suite 800
Barry Miller, M.D., Surgeon/Director

The Liposuction Specialists
Complimentary consultation for physicians, their families and office staff. (Offer expires June 30, 1993)

metastases in melanoma, and the threshold of resolution inherent in even the best pathologist's microscopic analysis, having a "negative" sentinel node may not guarantee freedom from eventual nodal involvement. This intriguing approach certainly merits further study, however.

Locally advanced melanoma and in-transit metastases

Major amputation in patients with recurrent, locally advanced, or in-transit melanoma—usually performed in the setting of extensive, necrotic, bleeding or fungating lesions with or without in-transit metastases—generates long-term, disease-free survival in 20% to 49% of patients, again indicating that even extensive local-regional disease does not inevitably presage systemic involvement¹⁷.

Hyperthermic, isolated extremity perfusion combined with chemotherapy and lymph node dissection (and often surgical excision of gross disease) generates long-term survival similar to amputation¹⁷⁻²⁰. Today most surgeons preferentially treat patients presenting with locally advanced disease and in-transit metastases in this manner.

Adjuvant hyperthermic limb perfusion and elective lymphadenectomy

Encouraged by the apparent ability of hyperthermic, isolated-limb perfusion to control locally advanced and in-transit disease, Ghussen and colleagues at the University of Cologne conducted a prospective, randomized trial of this versus elective node dissection alone. At almost 6 years median follow-up, they report 90% 5-year actuarial survival in the perfused group versus 62% in the group not perfused ($p < 0.01$)²¹. In contrast to others¹⁸⁻²⁰, they report no limb-loss complications from the treatment. Results of this treatment remain unsurpassed by other adjuvant treatment schemes, but have not yet been independently confirmed or reproduced by others.

Surgical resection of isolated metastatic disease

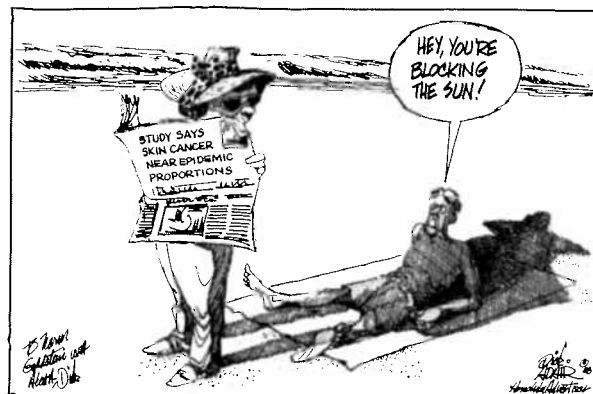
Overett and Shiu, reporting results of a retrospective study of 176 patients undergoing surgical resection of distant metastatic deposits of melanoma, found that 33% of such patients undergoing complete resection of single-site disease survived 5 years. In contrast, those undergoing incomplete resection suffered prolonged hospitalization, considerable morbidity and negligible benefit, this emphasizes the importance of mature surgical judgment and judicious selection of patients when considering such an approach²².

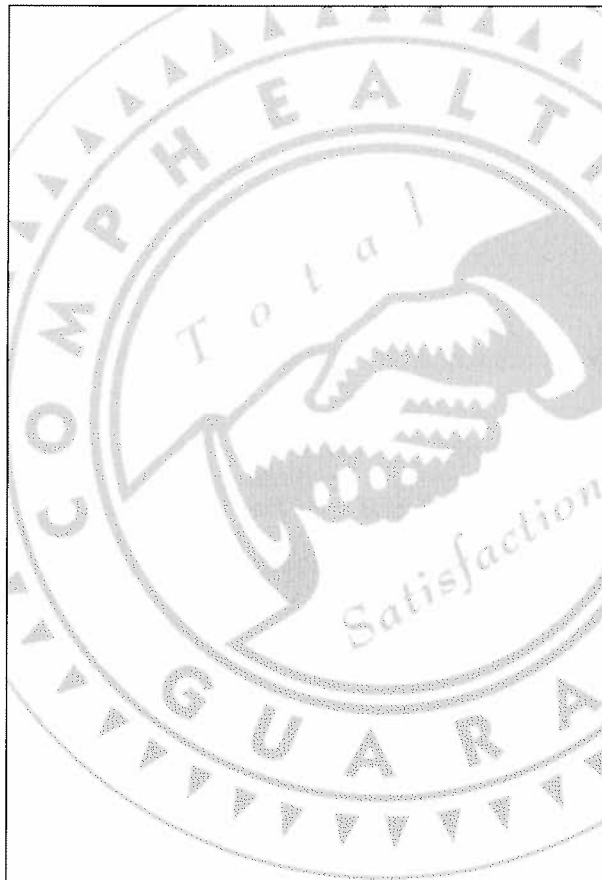
Summary

Surgical resection of disease constitutes the mainstay in primary treatment of localized and regional melanoma, offering long-term survival far in excess of any competing treatment to date. Some highly selected patients can even benefit from surgical treatment of isolated distant disease if complete resection can be achieved. Adjuvant treatments performed in conjunction with surgical procedures such as isolated hyperthermic limb perfusion continue to hold promise for improving survival.

REFERENCES

1. Davis N. Modern concepts of melanoma and its management. *Ann Plast Surg.* 1978;1: 628-629.
2. Holmstrom H. Surgical management of primary melanoma. *Sem Surg Oncol.* 1992;8: 366-369.
3. Eldh J. Excisional biopsy and delayed wide excision versus primary wide excision of malignant melanoma. *Scand J Plast Reconstr Surg.* 1979; 13:341-345.
4. Veronesi U, Cascinelli N. Narrow excision (1-cm margin); A safe procedure for thin cutaneous melanoma. *Arch Surg.* 1991;126:438-441.
5. Drzewiecki KT et al. Biopsy and prognosis for cutaneous malignant melanoma in clinical stage I. *Scand J Plast Reconstr Surg.* 1980; 14: 141-144.
6. Lederman JS, Sober AJ. Does biopsy type influence survival in clinical stage I cutaneous melanoma? *Am Acad Dermatol.* 1985;13:983-985.
7. Ames FC, Balch CM, Reintgen D. Local recurrences and their management. In: Balch CM et al. (eds.) *Cutaneous Melanoma*. 2nd Ed. Philadelphia, Pa: Lippincott Co. 1992;23.
8. Olsen G. Removal of fascia - cause of more frequent metastases of malignant melanomas of the skin to regional lymph nodes. *Cancer.* 1964;17: 1159-1164.
9. Kenady DK, Brown BW, McBride CM. Excision of underlying fascia with a primary malignant melanoma: effect on recurrence and survival rates. *Surgery.* 1982; 92: 615-618.
10. Morton DL et al. Improved long-term survival after lymphadenectomy of melanoma metastatic to regional nodes. *Ann Surg.* 1991;214: 491-501.
11. Wong JH, Cagle LA, Morton DL. Surgical treatment of lymph nodes with metastatic melanoma from unknown primary site. *Arch Surg.* 1987;122: 1380-1383.
12. Veronesi U et al. Delayed regional lymph node dissection in stage I melanoma of the skin and lower extremities. *Cancer.* 1982;49:2420-2430.
13. Balch CM et al. Elective lymph node dissection: pros and cons. In Balch CM et al. (eds.) *Cutaneous Melanoma*. 2nd Ed. Philadelphia, Pa: Lippincott Co. 1992;30.
14. Sim FH et al. Lymphadenectomy in the management of stage I malignant melanoma: a prospective, randomized study. *Mayo Clin Proc.* 1986;61:697.
15. Morton DL et al. Technical details of intraoperative lymphatic mapping for early stage melanoma. *Arch Surg.* 1992;127:392-399.
16. Jaques DP, Coit DG, Brennan MF. Major amputation for advanced malignant melanoma SG&O. 1989;169:1-6. 18. Cumberlin R et al. Isolation Perfusion for Malignant Melanoma of the Extremity: A Review. *J Clin Oncol.* 1985; 3: 1022-1031.
17. Krementz ET et al. Hyperthermic regional perfusion for melanoma of the limbs. In Balch CM et al. (eds.) *Cutaneous Melanoma* 2nd Ed. Philadelphia, PA: Lippincott Co. 1992;35.
20. Martijin H et al. Regional perfusion in the treatment of patients with a locally metastasized malignant melanoma of the limbs. *Eur J Cancer.* 1981; 17: 471-476.
21. Ghussen F. Hyperthermic perfusion with chemotherapy for melanoma of the extremities. *WJS.* 1989;13:598-602.
22. Overett TK, Shiu MH. Surgical treatment of distant metastatic melanoma: indications and results. *Cancer.* 1985;56:1222-1230.





You'll love working with our locum tenens physicians and allied health care professionals. **WE GUARANTEE IT.**

CompHealth has thoroughly credentialed physicians and allied health care providers from more than 40 fields of specialization available to provide locum tenens, or temporary, staffing assistance when and where you need it.

Plus, we have the standards and experience to guarantee your satisfaction each time we place a member of our medical staff in your practice or facility. It's the closest thing you'll find to a risk-free way to cover for absent staff members, "try out" a potential new recruit, or take care of your patients while you search for a new full-time associate.

Call us today to arrange for quality locum tenens coverage, or to discuss your permanent recruiting needs.

CompHealth

COMPREHENSIVE HEALTH CARE STAFFING

1-800-453-3030

Salt Lake City ■ Atlanta ■ Grand Rapids, Mich.

SHERATON MAKAHA
RESORT AND COUNTRY CLUB



The Mid-Week Break.

\$75 ONE NIGHT GETAWAY
Experience a "Neighbor Island style" getaway without the airfare, but with a \$10 dining credit. Rate valid Sun. thru Thurs. Slightly higher on weekends.
per room, per night

\$79 ROOM AND GOLF
Play on Oahu's "best course" (Golf Digest, Oct. 1991) and get a room for one incredible rate. Rate valid Sun. thru Thurs. Slightly higher on weekends.
per person, double occ.

Enjoy a round of golf, tennis clinic, horseback trail ride or just relaxing by the pool. For reservations, call 695-9511.



Sheraton Makaha
RESORT & COUNTRY CLUB
OAHU

ITT Sheraton

Tee times in Golf Package valid Mon.-Fri., excluding holidays. Second day of golf, \$45 after 11 a.m. Limited offer.

Rooms and tee times subject to availability. Not applicable to meetings and groups. Proof of Hawaii residency required.

Mohs Micrographic Surgery: A Synopsis

Jenny L Stone MD*

Mohs micrographic surgery is a method for removal of non-melanoma skin cancer in thin layers, allowing frozen-section examination of all peripheral and deep margins. Subsequent tissue layers are removed as dictated by microscopic examination, allowing for maximal sparing of normal tissue. This method offers cure rates significantly higher than excision or other modalities. Mohs micrographic surgery is the method of choice for removal of large, recurrent or incompletely excised skin cancers or for tumors located in regions of high recurrence.

Nationally, it is estimated that more than 500,000 new cases of non-melanoma skin cancer (primarily basal cell carcinoma (BCC) and squamous cell carcinoma (SCC)) are diagnosed each year¹. With exposure to the sun being the most important risk factor, Hawaii can be expected to have a high incidence rate. Indeed, skin cancer rates on Kauai, observed prospectively for 5 years, appear disproportionately high to the rest of the nation in unpublished data.

The majority of these cancers may be effectively treated with as compared curettage and electrodesiccation, excision, cryosurgery and irradiation. However, certain subsets of these carry with them higher recurrence rates and present a more demanding therapeutic challenge. Mohs micrographic surgery has emerged as the most reliable and effective method for removing the more difficult non-melanoma skin cancers. Mohs surgery offers maximal normal tissue preservation as well as the lowest recurrence rates of all current modalities for the treatment of non-melanoma skin cancer at high risk for recurrence.

Historical background

Frederic Mohs developed the technique originally in the 1930s at the University of Wisconsin. He applied a fixative paste of zinc chloride and stibnite directly to a patient's skin cancer, the paste was allowed to fix the skin overnight, and then the fixed skin was removed (without bleeding or need for local anesthesia) the following day. The tissue was processed using horizontal permanent sections after carefully mapping, grossing and color-coding the tissue to maintain strict orientation. The tissue was examined by Mohs for remaining tumor, which, when found, was drawn on the map as a positive area. The process was then repeated daily, removing tissue only in the remaining positive areas until the patient was tumor-free. This technique, called chemosurgery, was published in 1941² and was found in this and in subsequent studies to result in extraordinarily low recurrence rates, in the range of 1% or

lower for primary BCC^{2,3,4,5} and 2% to 4% for recurrent BCC^{2,6,7,8}.

In light of the extraordinarily low recurrence rates as a result of chemosurgery, some investigators began to modify the technique. Tromovitch and Stegman of the University of California at San Francisco found that fresh tissue, rather than fixed, removed from the patient and processed as frozen sections yielded equally good results as the fixed technique^{9,10,11}. In addition, the fresh tissue modification offered 3 advantages: 1) the pain from in situ tissue fixation was avoided; 2) multiple stages (layers of tissue removal) could be performed in one day, shortening considerably the time needed; and 3) the post-fixation tissue slough was avoided, allowing for immediate reconstruction.

Because of these distinct advantages, the fresh tissue technique has virtually replaced the fixed technique. The term "chemosurgery" is of historic value at present. With universal acceptance of the fresh tissue modification, the technique was renamed "Mohs micrographic surgery" in 1981^{13,14}, by the American College of Micrographic Surgery and Cutaneous Oncology.

Indications

Mohs surgery is an ideal method for precisely removing non-melanoma skin cancers that are more likely to recur, and those whose clinical margins are unclear or inaccurate. In general, there are 5 main predictors of skin cancers that will have a higher recurrence rate: 1) An aggressive histologic subtype; 2) regions of the human body with a higher recurrence

* Straub Clinic & Hospital
888 S. King Street
Honolulu

TABLE 1

Aggressive Histologic Subtypes

- Morpheaform or fibrosing BCC
- Adenoid BCC
- Infiltrative BCC
- Micronodular BCC
- Metatypical BCC (Basosquamous CA)
- Anaplastic SCC
- Acantholytic SCC
- Dermatofibroma sarcoma protuberans
- Microcystic adnexal CA

rate; 3) recurrent tumors; 4) clinical size > 2 cm; and 5) incompletely excised tumors.

Aggressive histology refers to several subtypes of non-melanoma skin cancer that routinely have microscopic extensions beyond clinically apparent margins. The most commonly encountered aggressive subtypes for which Mohs micrographic surgery is appropriate therapy are listed in Table 1. Subclinical extensions of morpheaform BCC in one study¹⁵ averaged 7.2 mm beyond clinically apparent margins. Figure 1 shows a preoperative clinical



Figure 1: Preoperative appearance of morpheaform BCC

appearance of a patient with morpheaform BCC. The postoperative appearance, after Mohs sections were shown to be tumor-free, is shown in Figure 2.

Location of a non-melanoma skin cancer is somewhat predictive of likelihood of recurrence. Certain locations of BCC of the head and neck result in higher-than-expected recurrence rates. These locations are depicted in Figure 3¹⁶ and include the nose (especially tip, ala, dorsum), nasolabial fold, columella, philtrum, periorbital areas, pre- and postauricular areas, temple, and the helix of the ear^{17,18}. SCC recurs more frequently and is more likely to metastasize when located on the ear, lip or in a burn scar¹⁹. In addition to the higher recurrence rate of central facial and periauricular lesions, these areas also command a great deal of functional and/or cosmetic importance. Maximal sparing of normal tissue, as well as high

(continued) ➤



DIAGNOSTIC LABORATORY SERVICES, INC.

Diagnostic Laboratory Services serves you and your patients with advanced computerized technologies for maximum reliability and efficiency. DLS provides a broad scope of high quality lab services at a reasonable cost.

- ◇ Quality Testing
 - * CAP Approved
 - * Qualified Technical Staff
- ◇ Reporting by Remote Printer Available
- ◇ Reporting Format Choices
- ◇ 24 Hour Client Services
- ◇ 24 Hour Phlebotomy Service
- ◇ In Office Testing Consultative & Support Programs
- ◇ Custom Panels
- ◇ Competitive Fees
- ◇ Conveniently Located Satellite Drawing Stations
- ◇ Reflex Option Testing
- ◇ Abnormal Summary Report by Physician and Test
- ◇ Most Extensive Menu of State-of-the-Art Assays
- ◇ And More...

*More Services, More Technology, More Quality
from
The State's Largest Independent Laboratory...*

DIAGNOSTIC LABORATORY SERVICES, INC.
770 Kapiolani Blvd, Suite 100
Honolulu, Hawaii 96813
(808) 547-4176

THE NAME TO REMEMBER FOR
PERSONAL, PROFESSIONAL INVESTMENT MANAGEMENT
FOR INDIVIDUALS AND BUSINESSES, IRAs,
PENSION AND PROFIT SHARING PLANS.

GREIG ASSOCIATES, INC.

Registered Investment Advisers Serving Hawaii For Over 30 Years

NO MINIMUM FEE OR ACCOUNT SIZE
NO CHARGE FOR INITIAL CONSULTATION

Phone 531-2722

Suite 1920, AmFac Tower, 700 Bishop Street, Honolulu, Hawaii 96813

cure rates may be best achieved with Mohs surgery in these areas.

Recurrent non-melanoma skin cancers pose a challenge to any modality of treatment. Recurrent tumors may track along old scar tissue and thus grow in an irregular fashion, producing subclinical extensions. Mohs surgery affords the highest cure rate compared with any other modality for recurrent BCC and SCC^{19,20} and is the treatment of choice for recurrent lesions.

Tumor size (preoperative) of > 2 cm carries an increased recurrence rate due to greater subclinical extensions²¹. In addition, SCC > 2 cm also has an increased metastatic potential¹⁹. Mohs reported a cure rate of 99.8% for BCC < 2 cm³. This rate decreased to 98.6% in tumors > 2 cm. By comparison, a study from NYU¹⁸ calculated the overall 5-year cure rate in primary BCC treated with excision to be 90.7%. The cure rate dropped to 87.9% in tumors >1.5 cm and 76.9% in tumors > 3 cm.

Incompletely excised tumors (recent excision with positive margins histologically) pose a high risk of recurrence if no further therapy is given. Pascal²² found that BCC treated by excision and found to have tumor present within 1 high-power field of the surgical margin showed a 12% recurrence rate if merely observed clinically. This rate increased to 35% when

the tumor actually involved the surgical margin. Positive margins indicate an extension of tumor that was not otherwise apparent clinically. The most definitive method of ensuring that the margins are clear is subsequent treatment by Mohs.

There are several other situations in which Mohs is favored as a method of treatment. A BCC or SCC with perineural spread carries an increased risk of recurrence. BCC in a patient with basal cell nevus syndrome may be aggressive, making tissue-sparing especially important; such cancers also are more numerous. Some less common skin malignancies also are amenable to Mohs surgery, such as verrucous carcinoma, sebaceous carcinoma, eccrine carcinoma (especially microcystic adnexal carcinoma), and dermatofibroma sarcoma protuberans. Some Mohs surgeons have applied this method of removal to melanoma; however, its use in pigmented lesions is not universally accepted and remains controversial.

Preparation

A patient referred for Mohs surgery should have had a prior biopsy with report and have slides available for review by the Mohs surgeon. A preoperative visit is ideal as the patient's medical history can be reviewed and any special requirements on the part of the patient (such as discontinuing anticoagulants, arranging for anticipated repair with a reconstructive surgeon, initiation of any prophylactic antibiotics) can be planned. The



Figure 2:
Postoperative
appearance of
patient in
Figure 1

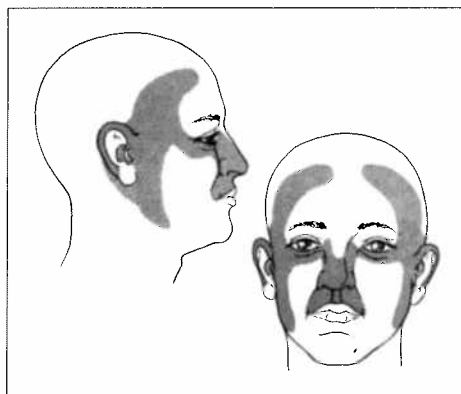


Figure 3:
Areas with
high risk of
BCC
recurrence*

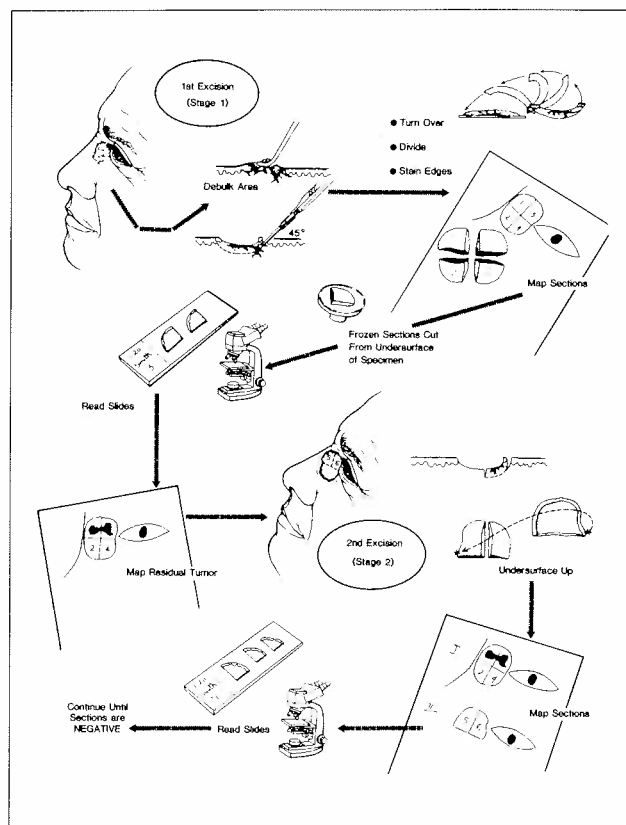


Figure 4: Schematic of Mohs micrographic surgical technique*

*Reprinted with the permission from the September 1983 issue of Archives of Dermatology, vol 119:761-773, Copyright 1983, American Medical Association.

lesion size may be determined on an initial visit and, if it is large, the case can be scheduled appropriately. Lesion size on clinical inspection, however, is not always accurately predictive of actual microscopic extent of tumor.

Technique

The procedure usually is performed in an outpatient setting, generally in a clinic, using local anesthesia. The tumor is first debulked, removing obvious cancer cells with a curette or scalpel. This process is outlined in Figure 4. A thin layer of tissue is then removed with a scalpel, beveling the edges to 45 degrees. Orientation is strictly maintained throughout the procedure. Several small cuts (scores) are made in the specimen and at the surgical site for alignment. Hemostasis is achieved with electrocoagulation and/or suture ligation, the patient is bandaged and is free to relax and wait in the waiting room while the tissue is being processed. The skin is mapped and divided into pieces of appropriate size by a technician (usually no larger than 1 cm) for frozen sectioning. Contrasting dye is used to mark cut edges to assist in orientation. The specimen is flattened on a glass slide to bring the epidermal edge into the same plane as the deep margin. The tissue is frozen in this position in a cryostat. The skin is then cut into horizontal sections on a cryostat, taking care to align the tissue chuck properly to ensure a complete section. Meticulous flattening of the tissue and positioning of the tissue chuck in the cryostat are essential in producing suitable horizontal sections. For this

reason, cryostat models that do not allow flexible positioning of the tissue chuck are not appropriate for this procedure. The frozen sections are then stained, coverslipped and presented to the Mohs surgeon for interpretation. The slides are examined by the surgeon for evidence of remaining tumor and areas noted to be positive for tumor are clearly marked on the tissue map.

The patient then returns to the treatment room for removal of additional tissue. By comparing the tissue map to the operative site, only tissue in the positive area will be removed, sparing tissue observed to be tumor-free. The process is repeated until all the sections are found to be negative. Of prime importance is the fact that the Mohs surgeon acts as both the surgeon and the pathologist. The orientation of the specimen in this procedure can be lost or obscured when more than one person performs both roles.

Unlike routine pathologic examination of excisions, the entire peripheral and deep margins are examined in Mohs sections. Traditional histologic exams of excisions, even wide excisions, only sample the margins in several areas. Statements of "margins free of tumor" on pathology reports do not imply that all of the margins were examined.

In cases of aggressive spread of tumor into vital structures such as ear canals, orbits, bone, major nerve trunks, it may be necessary to work in conjunction with physicians from other specialties. In such cases, an ENT surgeon, for example, may be guided by the Mohs surgeon to an area that remains positive for tumor in an ear canal or nasal bone. This may be done in an operating room setting under general or IV anesthesia.

(continued) ➤

WE'LL HELP YOU PAY OFF \$20,000 OF YOUR MEDICAL SCHOOL LOANS.



If you're certified in one of the following specialties:

■ anesthesiology ■ thoracic surgery ■ vascular surgery ■ general surgery ■ orthopedic/surgery ■ neurosurgery ■ plastic surgery

you could take part in the Army Reserve's Health Professionals' Loan Repayment Program that pays as much as \$20,000 in medical school loans.

As a member of the Army Reserve, you could be serving your country near home at times convenient to you. You'll also enjoy all the prestige and

privileges that accompany being an officer.

To find out more about the Health Professionals' Loan Repayment Program and all the other advantages of the Army Reserve, contact one of our experienced Army Reserve Medical Counselors. They can arrange for you to talk to an Army Reserve physician and visit a Reserve Center or medical facility.

1-800-432-7279
BE ALL YOU CAN BE.[®]
ARMY RESERVE

Sometimes it is necessary to process a tissue layer in permanent sections often necessitating a 1-day wait for results in cases where bone is involved (requiring decalcification) or in tumors found difficult to discern on frozen section.

Recurrence rates

A thorough review of the literature and a weighted comparison of recurrence rates from all modalities was done in 1 study for primary BCC²³. Looking at 5-year follow-up of primary BCC recurrence, surgical excision showed a 10.1% recurrence rate, curettage and electrodesiccation (C&E) a 7.7% recurrence, radiation therapy a rate of 8.7% and cryotherapy a rate of 7.5%. Some caution is advised in considering rates in C&E and cryotherapy because large, high-risk lesions may not have been included in many of these studies.

Overall all non-Mohs modalities had a recurrence rate of 8.7%. At 5-years' follow-up, removal by Mohs surgery resulted in a recurrence rate of 1%.

A similar study on recurrent BCC²⁰ with 5-year follow-up also was observed. Surgical excision showed a recurrence rate of 17.4%, radiation therapy a rate of 9.8% and C&E a rate of 40%. Cryotherapy had a short-term recurrence rate of 13%, but there was no data on cryotherapy 5-year follow-up.

All non-Mohs modalities had an overall recurrence rate of 19.9%. Mohs surgery showed a weighted average of 5.6% recurrence rate 5-years later. Therefore, according to these studies, non-Mohs modalities have a recurrence rate 8 times that of Mohs in primary BCC and 4 times that of Mohs in recurrent BCC.

In primary SCC of the skin, a similar study examined the 5-year recurrence rate using the following therapeutic methods¹⁹: Surgical excision had a local recurrence rate of 8.1%, curettage and electrodesiccation a rate of 3.7, and radiation therapy a rate of 10%. Again, there may have been some bias in selection with respect to the C&E modality, as this method is not used very often in large, high-risk SCC. Overall non-Mohs methods show a 5-year recurrence rate of 7.9%.

Mohs surgery was found to have a 3.1% recurrence rate after 5 years. In locally recurrent SCC, surgical excision had a 5-year recurrence rate of 23%, compared with a 10% recurrence rate with Mohs surgery.

Several factors increase risk of recurrence or metastasis in SCC, including the degree of differentiation, the size of the tumor, its depth and site. In SCC of ≤ 2 cm, surgical excision affords a cure rate of 83.5%, but when > 2 cm, the cure rate drops to 58.3%. Comparison with Mohs shows 98.1% and 74.8% cure rates respectively. Surgical excision of well-differentiated SCC offers a cure rate of 81.0%, but this drops to 46.4% for poorly differentiated SCC. By comparison, Mohs cure rates are 97% and 67.4%, respectively. Mohs surgery affords the patient with SCC a significantly increased cure rate, even in cases at high risk for local recurrence and metastasis. Lower cure rates for Mohs surgery in poorly differentiated SCC may reflect the tumor's propensity for early metastasis; it is also more difficult to define this tumor on frozen section.

The pros and cons

As described above, Mohs micrographic surgery offers significantly increased cure rates in cases of BCC and SCC as compared with other methods. In addition, maximum sparing of healthy tissue is achieved; this is of prime importance when cancers occur on the face and ears. The vast majority of Mohs surgical procedures are done using local anesthesia in an outpatient setting, avoiding the risk of general anesthesia and operating room charges. Long-term cost is less, as recurrence is much less likely, thus avoiding subsequent procedures.

A relative disadvantage is that special training is necessary to perform Mohs micrographic surgery. Typically, fellowship programs require 1 to 2 years' training after a dermatology residency (or after an ENT or plastic surgery residency). A laboratory setting that incorporates a cryostat and staining hood also is necessary. It is essential that an expert technician be available who has had special training in preparing Mohs sections.

Mohs surgery is certainly more time consuming than other modalities, the time spent in processing often runs from a half hour to 1 hour per stage. Very large tumors may require numerous sections and will take several hours to process. This fact may deter some patients who may be unable or unwilling to wait for the tissue to be processed. The short-term costs of the procedure also are greater than those of other previously mentioned methods.

Conclusion

Mohs micrographic surgery offers the highest cure rates at present for non-melanoma skin cancer. It is the method of choice for patients at high risk of recurrence of non-melanoma skin cancer: Those with large, recurrent, incompletely excised or aggressive tumors or with tumors in areas of high potential for recurrence. Practitioners who evaluate patients with non-melanoma skin cancer are well-advised to be familiar with this method in order to give proper informed consent to their patients about the choice of therapeutic methods.

REFERENCES

1. National Institutes of Health: Incidence of nonmelanoma skin cancer in the U.S. Publication No. NIH 82-2433. Washington, DC, U.S. Government Printing Office, December 1981.
2. Mohs FE. Chemosurgery: A microscopically controlled method of cancer excision. *Arch Surg.* 1941;42:279-295.
3. Mohs FE. Chemosurgery: microscopically controlled surgery for skin cancer. Springfield, Ill. Charles C. Thomas, 1978.
4. Tromovich TA, Beirne GA, Beirne CG. Cancer chemosurgery. *Cutis.* 1965;523-529.
5. Phelan JT, Milgrom H. The use of Mohs chemosurgery technique of the treatment of skin cancers. *Surg Gynecol Obstet.* 1967;125:549-560.
6. Bart R, Schragger D, Kopf A, et al. Scalpel excision of basal cell carcinoma. *Arch Dermatol.* 1978;114:739-742.
7. Robins P. Chemosurgery: A surer method to treat basal cell epithelioma. *Consultant.* 1974;14:137-142.
8. Robins P, Menn H. Chemosurgery in the treatment of skin cancer. *Hosp Pract.* 1970;5:40-50.
9. Tromovich TA, Stegman SJ. Microscopic-controlled excision. *Dermatol Digest.* 1976;15:12-19.

10. Tromovich TA, Stegman SJ. Microscopic-controlled excision of cutaneous tumors. *Cancer*. 1978;41:653-658.
11. Stegman SJ, Tromovich TA. Fresh tissue chemosurgery for tumors of the nose. *Eye Ear Nose Throat*. 1976;55:53-55.
12. Swanson NA, Taylor WB. Commentary: The evolution of Mohs stone surgery. *J Dermatol Surg Oncol*. 1982;8:650-654.
13. Bernstein G, Cottel WI, Bailin PL, et al. Mohs micrographic surgery. *J Dermatol Surg Oncol*. 1987;13:13.
14. Cottel WI, Bailin PL, Albom MJ, et al. Essentials of Mohs micrographic surgery. *J Dermatol Surg Oncol*. 1988;11-13.
15. Salasche SJ, Amonette R. Morpheaform basal-cell epitheliomas: A study of subclinical extensions in a series of 51 cases. *J Dermatol Surg Oncol*. 1981;7:387-392.
16. Swanson NA. Mohs Surgery: Technique, indications, applications and the future. *Arch Dermatol*. 1983;119:761-773.
17. Levine HL, Bailin PL. Basal cell carcinoma of the head and neck: Identification of the high risk patient. *Laryngoscope*. 1980;90:955-961.
18. Dubin N, Kopf AW. Multivariate risk score for recurrence of cutaneous basal cell carcinomas. *Arch Dermatol*. 1983;119:373-
19. Rowe DE, Carroll RJ, Day CL. Prognostic factors for local recurrence, metastasis and survival rates in squamous cell carcinoma of the skin, ear and lip. *J Am Acad Dermatol*. 1992;26(6):976-990.
20. Rowe DE, Carroll RJ, Day CL. Mohs surgery is the treatment of choice for recurrent (previously treated) basal cell carcinoma. *J Dermatol Surg Oncol*. 1989;15(4):424-431.
21. Burg G, Hirsh RD, Birger K, et al. Histographic surgery: Accuracy of visual assessment of the margins of basal cell epitheliomas. *J Dermatol Surg Oncol*. 1975;1:21-24.
22. Pascal RR, Hobby LW, Lattes R, et al. Prognosis of "incompletely excised" vs. "completely excised" basal cell carcinoma. *Plast Reconstr Surg*. 1968;41:328-332.
23. Rowe, DE, Carroll RJ, Day CL. Long-term recurrence rates in previously untreated (primary) basal cell carcinoma: implications for patient follow-up. *J Dermatol Surg Oncol*. 1989;15(3):315-328.



An Emerging Concept: Integrated Health Care Systems



"After years of managing a busy surgeon's office, I know that it's a constant struggle to track changing insurance requirements. Praxis account managers realize that staying current is increasingly difficult for private physicians, and we have designated areas of expertise to keep physician's informed."

**Lori S. Sakumoto
Account Manager**

The national focus on health care reform will force physicians to decrease cost and increase efficiency.

Praxis offers the solution. Our "clinic without walls" concept provides more than the traditional billing package.

It includes:

- Reduced staff turnover and training
- Increased cash collections
- Immediate follow-up on insurance claim appeals
- Updates in coding and government regulation changes, and
- Graphical management reports for better decision making.

And by developing a physician information network, Praxis can help physicians maintain their influence in the health care industry, control costs and increase the quality of patient care.

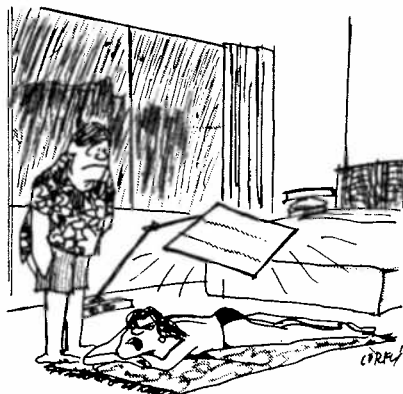
For more information about our services, contact us at 941-3363.



Praxis

Ala Moana Building, Suite 1500, 1441 Kapiolani Boulevard, Honolulu, Hawaii 96814-4490

CORKY'S HAWAII



"I'M NOT GOING HOME WITHOUT A TAN!..."

AMAZING CURE!

Cure your ailing business savvy by subscribing to *Pacific Business News*. Every Monday, it's delivered right to your office. We feature how-to articles, practical business tips, news affecting businesses large and small, office space vacancies, and much more. If you're interested in improving the health of your business, call:



808-521-0021

The Kauai Skin Cancer Study—1983 to 1992

George T Reizner MD*

The Kauai Skin Cancer Study began as a modest effort in 1983 to look at this island's skin cancer incidence. David Elpern MD, Kauai's only dermatologist at the time, was interested in the large number of these tumors in his practice. He first enlisted his office staff to help keep track of the numbers and type of these skin cancers. Along with this information, the basic demographic data on each patient was collected. These records became the first entries into what has become a decade-long project.

Hawaii's strong ultraviolet light and predictable good weather create an opportunity to study solar radiation's effect on a population. This, coupled with the outdoor life-style of many of its residents and visitors theoretically increases the risk for skin cancer.

The collection of data on Kauai was simplified by several features, making this island a good site for study. There is only one pathology laboratory, which greatly standardizes data and case identification. Also important, most patients seek their medical care on island; therefore, with good confidence, most biopsy-proven cases can be captured. Even if another physician treated the patient on Kauai, the pathology specimen would pass through the one laboratory allowing it to be included in the count.

The presence of several different ethnic groups on Kauai invites the simultaneous study of these different in types in the same environment. This one feature alone led to several publications reporting the lesser-known incidence of skin cancer in non-Caucasian populations. All of these preexisting conditions and circumstances allow for easier collection of data and underscore this setting's value as a site for investigation.

The Kauai skin cancer study includes not only basal cell carcinomas and squamous cell carcinomas but also records the incidence of Bowen's disease, keratoacanthomas, melanomas, and various other uncommon cutaneous malignancies. This expanded list enables us to check more reliably their frequency, especially when recorded over many years.

Now, 10 years later, the scope of the Kauai Skin Cancer Study has exceeded its original design. Kauai, as a natural laboratory, has shown itself well suited to the study of skin cancer with several papers already published that discuss the results and experience of this project.

One of the first articles examined the relative increase in non-melanoma skin cancers in the Kauai Japanese population as compared to the experience in Japan¹. The crude rate of

skin cancer found in Kauai's Japanese patients was 88 times greater than that reported in Japan. Interestingly, the tumors here occurred only in patients >60 years old. When the age-adjusted rates were calculated with this in mind, an incidence 33 times greater than in Japan was reported.

Although the absolute rates were still much lower than those reported in the Caucasian population, this unexpected finding in the Japanese contained several messages. First, as originally suspected, the incidence of skin cancer on Kauai was proving to be an increased health risk. Second, both the lower incidence when compared to Caucasians plus the relatively delayed tumor onset in this non-Caucasian population reinforced the concept that partial but incomplete protection from tumor formation was conferred by darker skin. Third, it showed monitoring several ethnic groups in parallel was proving valuable; and finally, that probably all these groups were at some increased risk.

In an article recently accepted for publication, we looked at the skin cancer incidence in our Caucasian population. Kauai has the dubious distinction of having the highest reported rate of basal cell carcinomas currently observed in the United States. Work in progress based on this data includes studies documenting the incidence of basal cell carcinoma on Kauai and particularly of keratoacanthomas. A third investigation looks at the incidence of basal cell carcinomas, squamous cell carcinomas and keratoacanthomas in the Filipino population, and a fourth will report on basal cell carcinomas and keratoacanthomas in Hawaiians. Papers on these topics have already been accepted by peer-reviewed journals.

An important work underway is our 10-year experience with malignant melanoma. Many useful insights may be possible by cross-referencing these patients with those in the non-melanoma study. It is still too early to speculate, yet certain skin cancers or combinations of skin cancers may serve to alert us to a higher risk of melanoma. The outcome of this part of the project is being awaited with heightened interest.

The future for the Kauai Skin Cancer Study is equally interesting as we pursue many additional venues of investigation. This data base, which is currently supported by a Veterans Administration Merit Grant, has shown itself to be a rich source of information. The final years of the 10-year study are being collected and prepared for statistical analysis.

The study has been a cooperative effort by many physicians and scientists. Dr. Evan Farmer from Johns Hopkins read many of the early slides; Tsu Yi Chuang MD MPH from Wright State University has added his epidemiological skills and been instrumental in writing papers and grants. Jenny Stone MD from the Straub Clinic & Hospital in Honolulu has seen and treated patients, collected information from them

* George T Reizner MD
Associate Professor of Medicine, Dermatology
University of Wisconsin

and has done much of the early computer work. The entire dermatologic staff at the Kauai Medical Group deserves both praise and thanks. Additional special recognition goes to Terrilea Burnett, whose thoroughness contributed significantly to each phase of this project, and Katie Beer, who has assumed many of the same responsibilities.

The team of pathologists at GN Wilcox Memorial Hospital in Lihue: Rex Couch, Gerald Tomory, Jonathan Charles, and posthumously Robert Emrick, plus their office personnel, Louise Yates and Fern Bungcayao, have been indispensable in offering learned opinions and in collecting and retrieving thousands of cases. Without their support, interest and help, we never could have undertaken this study. I have served as a liaison to help hold the project together. Over the years I have logged many long hours of reading slides, contacting patients, entering data, combing through charts, writing papers and attending to many extra details. My reward has been the satisfaction of seeing this project through and the opportunity to travel from the Mainland and visit this beautiful island regularly.

Finally, although many have collaborated at various levels for the success of this project, it is David Elpern's initial interest that made it possible. Those of us involved are grateful for his continuing contribution and salute his curiosity that enabled him to conceive and shape this program.

Summary

The Kauai Skin Cancer Study offers a small glimpse into understanding cutaneous malignancies. Through these efforts valuable data may be gathered. It is hoped this can be translated into useful clinical information with a positive impact on both public health education and medical care.

REFERENCES

1. Leong G, Stone J, Farmer E, Scotto J, Reizner G, Burnett T, Elpern D. Nonmelanoma skin cancer in Japanese residents of Kauai, Hawaii. *J Am Acad Dermatol.* 1987;17:233-8.



A Sure Cure For Meeting Problems.

A breakfast, lunch or dinner meeting for ten, forty or 1500, The Ilikai will handle it with ease.

- More than 25,000 square feet of meeting space
- 23 meeting rooms, including Corporate Board Rooms
- Exclusive Executive Meeting Suites
- Our 15,340-square-foot Pacific Ballroom accommodates 100 trade show booths or 2,000 for cocktails!
- We specialize in custom-catered menus, excellent food and personalized, efficient service
- Our expert business and catering staff works magic — even with last-minute arrangements

Plus, the most convenient location in town and ample parking. The Ilikai. Hawaii's Business Address.TM

MENTION THIS AD FOR A "PHYSICIAN'S SPECIAL" RATE ON EXECUTIVE MEETING SUITES. (Good through 7/31/93. Some restrictions may apply.)

CALL 949-3811 AND ASK FOR OUR CATERING SALES SPECIALISTS (Be sure to inquire about our special seasonal rates!)



The Lanai Room is one of our Corporate Boardrooms.



Hawaii Patient Accounting Services, Corp.

"Specializing in Medical Billing, Collections, and Consulting Services."

Bill Shanks
General Manager

(808) 696-1547

86-260 Farrington Highway • Waianae, Hawaii 96792

Learning to Save Our Skin

Paul Berry*

With serious depletion occurring in the stratospheric ozone layer, we face a public health problem that poses an educational challenge as well. How do we teach our children about the hazard and how to respond to it? Although we have the science to demonstrate the problem, changing young people's behavior on a large scale is at best a slow and uncertain process, especially when the behavior involves something most of them perceive as a familiar pleasure and a reward: The Hawaii sun.

The task of teaching others about ozone-depletion and the health hazards of ultraviolet rays was posed to students (grades 10 through 12) in my Earth-at-Risk class at Punahou Academy, and we have spent 9 weeks learning about the problem and developing a variety of ways to educate others about the need to use sunscreen. It is a curious undertaking, for it involves students collaborating with dermatologist Dr. Norman Goldstein, the Sea Grant Program at University of Hawaii, the Cancer Society, the Department of Health, a representative from the Department of Education, and finally teachers throughout our school. In short, this is a different model of education, one aimed at providing others a service that they may not realize they need. The basic premise lies in the assumption that, armed with the right information and a variety of approaches, children may be more credible as public health teachers than adults or authority figures.

As they have learned about ozone depletion, the increase in UV rays and consequent health risks, students have examined their own attitudes in hopes of understanding how other young people might resist what they need to learn. Here are some of the assumptions they have used in developing approaches to teaching others about increased hazards of sun exposure.

1. Once you know the extent of ozone depletion and the increase in UV rays, you have a clear responsibility to teach others. Kids, however, are not always willing to take responsibilities.

2. If you tell people that there is an invisible layer of something overhead that has a hole in it, listeners at first feel puzzled. If you say there is a new hazard in sunlight from rays you can't see, you run a similar risk.

3. Students who don't feel strong in science may tune-out when asked to examine the chemistry of ozone depletion.

4. When the discussion suggests this ozone depletion means that time spent in the sun needs to be altered, the listener's defenses rise and denial is quite normal.

5. While denial is quite powerful, the combination of peer pressure, a positive approach, and testimonials from other young people whom kids admire can move young people of all ages onto the sunscreen bandwagon.

6. The information has to appear in a variety of forms, not all of them academic; TV is a must.

7. Young people are naturally concerned about their appearances and a tan is presently perceived as attractive. Our sunscreen program is working against a youth-culture tradition. On the other hand, a poster showing facial wrinkles caused by exposure to the sun sets off strong reactions among teenagers. Teenage women who are concerned about makeup being disrupted by sunscreen will be more concerned about what wrinkles can do to their appearance.

8. Kids naturally feel immortal and focus on the moment or the near horizon. Talk of cumulative damage to skin, eyes or the immune system will have more impact if it comes from someone they know and trust.

9. We don't know what will get the best results in moving kids to the use of sunscreen, it may vary from student to student.

Because all curricula at Punahou are created by our teachers, we also agreed that the real job lay in getting the full attention of teachers, ie to have them take what we would give or point out to them and find ways to tailor units for their own classes.

After teaching high school for more than a generation, I believe that, regardless of the subject, kids face 2 questions in every class: What is going on here? and, what has it got to do with me? If they feel there is a significant answer available for the second question, they have a lot easier time becoming interested in the first question. In the case of the sunscreen issue, there is also an obvious third question: What can I do to protect myself?

My class discussed possible names for our program and settled on Save Our Skin; the acronym SOS was appealing and looked like a good prospect for an attractive logo. Next, we clarified what we were trying to accomplish. Students of all ages need to learn that: 1. A new danger exists in overexposure to the sun; 2. you may find the environmental causes of the hazard interesting because they are in part man-made, but you need to know the health consequences; 3. you can easily learn how to protect yourself, but it takes a change in attitude about time in the sun.

We are developing a package of materials for all teachers, kindergarten through grade 12. Before disseminating the information widely, however, we need to try the package on a few teachers first to see how useful it is. As we develop our materials, our initial push in elementary school will be through our outdoor education programs in grades 4, 6, and 8; all students in the grade spend anywhere from 3 days to 6 days in nature outdoors and have immediate need for sunscreen information. We also will provide packages to physical education teachers at all levels, and to coaches of outdoor sports, along with sunscreen samples.

We hope to approach high school students through a variety of venues including posters, assemblies with slides and testimonials, and classroom teaching units.

Our goal is to motivate all 3,700 Punahou students to put on sunscreen (SPF 15 at a minimum) after a morning shower or in their homeroom meetings at the beginning of the school

* Teacher at Punahou School

day. To see how effective this program will be in our high school, we have selected 8 homeroom classes, 2 each in grades 9 through 12, to receive posters, information, and sunscreen. We will ask parents of these students to provide them sunscreen to bring to and use at school. If students do not bring sunscreen, we will ask parents for written permission for the school to provide an SPF 15 sunscreen, and we will encourage youngsters to use it. Funding for the sunscreen that Punahou provides will come through income from the school's recycling program with the City and County of Honolulu. After we track the use of sunscreen by students in these classes, we will revise our approach as needed to reach all 1,600 students in our high school.

In April this year we kicked off our program by putting up a variety of American Cancer Society posters in prominent places—in the cafeteria, at the entries to our libraries, and near club bulletin boards. Next, in an assembly, our senior students saw and heard a student slide show about safe beach-going and outdoor athletics, followed by brief remarks by student speakers—athletes, surfers, and class-leaders supplying sunscreen testimonials. Modified for each audience, students presented this same assembly to students in grades 9, 10, and 11.

Our teacher package will include an adaptation of the sunscreen booklet written and produced by Bruce Miller and Scott Bogle at the University of Hawaii Sea Grant Program. Additional copies of useful science and social studies lessons, along with news and scientific articles will be appended to the newly illustrated, 2-color booklet.

The causes and chemistry of ozone depletion offer a great opportunity for students to investigate a real-life environmental problem that affects them directly. Because the information shows UV conditions worldwide and has copies of NASA satellite photos, we hope that teachers will take advantage of the opportunity to teach geography, investigative science, politics, economics, and ethics: for here is an issue that has brought nations together in search of a way to halt man-made causes of ozone depletion. We also will include an art assignment to allow youngsters to depict their understanding of the problem and arrange to display their work in our libraries.

Miller and Bogle of Sea Grant have also shown students how to read UVB

(continued on page 144) >

TAKING THE COMPLEXITY OUT OF INVESTMENTS

With H.M.O.'s, P.P.O.'s, I.P.O.'s, perplexing insurance forms and delayed claim payments, it's amazing how physicians even have time for their patients.

Likewise, if you're like Dr. Miura and many others, you don't have time to research a vast field of investments in planning for your financial future.

HAWAIIAN

CAPITAL

SECURITIES

Hawaiian Capital Securities cordially invites you to attend a lecture that takes the complexity out of "tax-free" investments.

Date: Thursday, May 27th

Time: 7:30 - 8:30 a.m.

Place: The Pacific Club

The State Specialist
in
"TAX-FREE"
Municipal Bonds

Call 522-5955 for your reservation.

GIVE YOUR PATIENTS THE CARE THEY DESERVE

... 24-hours a day.

You never know when an emergency will come up. When your patients call, they depend on you to be there with medical care and advice. Keep yourself accessible with Voice Mail and pager notification services from Telememo Pacific.

With our incredibly affordable rates, you can give your patients the extra security of knowing you're there. Give us a call today.



545-1800

TELEMEMO-PACIFIC, INC.

1188 Bishop Street • Suite 2711



FIGURE 1: Kanani Taliaferro and Suzie Oki trying a handheld UV ray meter

rays with a prototype hand-held Sunsensor-meter that they have temporarily lent to us. When these meters become available commercially in the fall for about \$30, we plan to use some of the school's income from community recycling to buy a number of them for use in science classes from elementary through high school. By computer and modem, Sea Grant also has made available to us daily readouts of UV rays from the more sophisticated UV meters at UH Manoa and atop Mauna Kea on the island of Hawaii. Here is an opportunity for children to use technology to learn how to monitor shifts in stratospheric ozone and consequent increases in UVB rays, real science at the moment. Thus far, when students have measured the UV data themselves and have seen what it means in terms of their health, they are far more likely to become sunscreen-users.

With up-to-date UV measurements, people of different skin types can now establish how long a time they have in the sun before they will begin to burn. Local dermatologists have developed 4 categories of skin types: Always burns/ never tans; usually burns/sometimes tans; sometimes burns/ usually tans; never burns/always tans. Building on this information and on data from the producers of Sunsensor-meter and from UH Sea Grant, my Earth-at-Risk students are now designing color posters to show what the UV readings mean for people with differing colors of skin. Students will be the models depicted on the posters as well as the photographers and graphic designers, collaborating with our media-support specialist. Once we have the prototype posters completed, we will be happy to share them with other agencies for their production and distribution.

Finally, because Punahou has video-production facilities and students taking advanced video production courses, 2 talented young video producers from our Television Journalism class have been assigned to work with 2 classmates from Earth-at-Risk to write and produce a 10-minute videotape in which kids teach kids about the need to use sunscreen. Like the slide show, the lighthearted, positive focus will remain on kids of various ages and skin colors involved in normal outdoor activities: Skateboarding, swimming, playing volleyball in the park, shooting baskets in the schoolyard, or just sitting in the sun.

Because video production is labor intensive, our students hope to complete their production and make it available for use at Punahou sometime in May of 1993. If the tape succeeds with its audience, we will make available a master to

private and public schools with which to make their own copies.

We are also examining other video productions which tell the story of ozone depletion and health hazards, and we hope to add a video bibliography of the best to our teacher package.

Because they are aware of the new potential for damage by the sun and hazards to health, Punahou President Rod McPhee and Principals Win Healy and Duane Yee have been very supportive of our efforts. By using students to teach other students, and by collaborating with Dr. Norman Goldstein, UH Sea Grant, the American Cancer Society and other community agencies, Punahou School hopes students will learn to save their skins for a lifetime.

Appendix

Save-our-skin materials

1. Questionnaire per age level concerning: knowledge of ozone problem, UV rays, sunburn frequency and impact, sun screen use.
2. Posters:
 1. The hole story
 2. Skin like leather
 3. Ban the burn
 4. Honolulu newspaper full-page copies
 5. Student-made posters
3. Handout: Look for the danger signs; sample melanomas for ABCD.
4. Booklet for Teachers: ozone chemistry, causes; UV impact on all life; preventive measures against CFCs, etc; UV impact on human health, protective measures for human health. Reading. Sample quiz/questionnaire. Sample sunscreen experiment, with accompanying sunscreen samples.
5. Color slide/overhead projections of planet Earth receiving the sun's rays, and NASA satellite photos of ozone hole.
6. City by city, region by region UV-ray index.
7. Xeroxed news reports on the ozone hole and its consequences.
8. Xeroxed magazine and scientific articles.
9. Student-created poster with skin types. UV readings, and color pictures of skin types.
10. Student-created slide show on depletion of ozone, UV problems, causes, protections. Also has live teenage models (surfers, athletes, beach-goers) using hats and sunscreens.
11. Video productions: Student productions showing kids imparting message to other kids.
 - Commercials. Professional productions: Dick Cavett; preventive measures for CFCs etc.
 - Sunsor tape; After the Warming by James Burke
12. Permission slips for students to sign in order to use sunscreen.
13. Science and Social Studies curricular exercise Australian form.
14. Sample letters to write Congress, President, EPA, manufacturers.
15. Macintosh Computer game: Global Recall. Offers a simulated version of actual ozone data and possible solutions to examine.
16. Student art and student logos.
17. Sunsensor meter available probably in fall for \$20 to \$30 to use in reading UVB rays. Useful to science labs.



**"This is my
entire checkbook."**

Clifford Kawano, Branch Manager

Introducing CHECK CARD.SM It makes life simpler!

Our new CHECK CARD is as easy to use as a credit card, but your purchases are deducted directly from your checking account. It's that simple! There's never any debt to worry about, and no interest charges. It's accepted everywhere VISA is, all over the world. There are no hassles, and no i.d.'s to show. Even ATM's worldwide participating in the PLUS system or VISA network accept CHECK CARD. Stop by any Central Pacific Bank branch today and we'll help you get your own CHECK CARD.



Central Pacific Bank
We Put You First! Member FDIC

Main Branch / 220 S. King Street / Phone 544-0500

Editor's note:

Christine Trecker is a 20-year resident of Oahu. She lives on the windward coast with her husband and daughter and enjoys the indoors and outdoors. Her background is in marketing research and advertising.

She realized the need for this type of publication for our resi-

dents and our visitors as well. All profits from the book sales go to the Friends of Foster Kids. Books are available at Liberty House and most bookstores..

Norman Goldstein MD

NEW ULTRAVIOLET MONITORING (continued from page 116)

scientific and nontraditional settings. The EMTEC Uviscan™ PDU is a public display unit approximately 1 meter square (Figure 1). Data on UV intensity are displayed as individual "time-to-burn" values for each skin type. (The EMTEC Uviscan™ PDU has been calibrated for skin types 1 to 4.) The unit's display rotates through 360° to ensure maximum visibility from all surrounding areas. A measurement of UV is made at the beginning of a series of 4 rotations; the unit then displays the estimated time-to-burn for each skin type. When the cycle is complete, the UV sensor takes a new measurement and the display values for each skin type are updated. Measurements are made every 4 minutes, though this rate can be adjusted to suit the unit's particular application. The unit is intended for installation in public recreation areas such as beaches and playgrounds; Figure 1 illustrates the positioning of the EMTEC



Figure 1: Copyright EMTEC Ltd

Uviscan™ PDU above a lifeguard station on Waikiki Beach in Hawaii, one of the first sites to employ EMTEC technology. The unit has been designed so that the display is visible from up to 100 meters away, even under the most glaring conditions.

Two similar but smaller devices are presently being designed: The EMTEC Uviscan™ Professional and the EMTEC Uviscan™ Domestic. The Professional has been designed for use in commercial establishments with high popula-

tion density, where long-distance visibility is not essential. Hotel swimming pools and tennis courts are 2 typical applications for this device. The EMTEC Domestic has been designed for the home environment, again for use near the swimming pool or during children's backyard playtime.

EMTEC technology also makes possible accurate personal UV monitoring. The pocket-size EMTEC Uviscan™ Personal is an intelligent device that allows the user to insert his or her skin type, sunscreen SPF number and the amount of sun exposure per day. The Uviscan Personal then displays the estimated time-to-burn. Every 30 seconds the unit takes new measurements and updates the display accordingly.

A final product is designed for use on children. It is non-programmable, allows for only 1 skin type (type 1) and the parent is required to apply a sunscreen of SPF 15 or higher to the child. In this manner, EMTEC hopes to encourage a relationship between the regular use of sunscreen and an adequate SPF number for the child's protection against the sun. The unit measures and records accumulated UV exposure and displays the accumulated dose in the form of up to "10 suns" on a liquid crystal display. When the tenth sun has appeared, an alarm sounds which means that the child should be taken indoors in order to avoid overexposure.

Summary

The EMTEC sensors include a range of products appropriate for different uses in different locations. It is envisioned that this technology, used in conjunction with public health education, will have a significant impact on sun-oriented behavior. The message being delivered will be accompanied by quantified information directly useful for gauging sun exposure.

With the technological elements now in use, a low-cost, ground-based UV monitoring network can be established. EMTEC is actively establishing such a facility in association with interested organizations on a worldwide basis. Dissemination of this information will raise public awareness of skin cancer issues and assist institutions in vital research.

The development of the EMTEC sensor marks a new era in UV monitoring and places an emphasis on the responsible use of products based on new technology.

GENDER-RELATED ISSUES IN MALIGNANT MELANOMA (continued from page 124)

Centers for Disease Control (CDC) show that the death rate from melanoma in women increased 21% from 1973 to 1988 while the death rate for men increased 50%.⁶ In fact, according to the CDC, the death rate for melanoma in men is increasing faster than for any other cancer.

Conclusion

The incidence of melanoma is increasing most rapidly in women under 40 whereas the death rate from this tumor is rising more rapidly in older men. Because the only cure for this cancer remains early detection and treatment, increased public education and promotion of awareness among both women and men are needed in order to minimize the hazards from melanoma.

Editorial comment:

Dr. Rigel is a "world authority" on melanoma.

Norman Goldstein MD

REFERENCES

1. Boring C, et al. Cancer Statistics. CA. 1993;43:19-36.
2. Friedman R J, Rigel D S, Kopf A A, et al. Malignant melanoma in the 1990s: The continued importance of early detection and the role of physician examination and self-examination of the skin. CA. 1991;41:210-226.
3. Koh H K, Miller D R, Geller A C, et al. Who discovers melanoma? J Amer Acad Dermatol. 1992;26:914-9.
4. Geller A C, Koh H K, Miller D R, et al. Death rates of malignant melanoma among white men-United States, 1973-1988. MMWR. 1992;41:20-21.

MAKA O KE KAUKA

Russell T Stodd MD

The trouble with the world is that the stupid are cocksure and the intelligent are full of doubt.

On March 29, 1993, the first open hearings on the Clinton health care plan were conducted by VP Albert Gore. Ms. Hillary Rodham Clinton was called away due to her father's illness. There was general praise for the plan from various interests, but also some heavy criticism. Specifically, representatives of the AMA, AHA, insurance groups, and research technology were united against wage and price controls. Ray Scalettar MD, chair of the AMA Board of Trustees, spoke clearly when he said that cost controls have never been achieved in this or any other economy by arbitrary caps on expenditures. Additional negative response came from business interests deploring the concept of employer-mandated health insurance. Washington rumors were that the hearings were largely for posturing and catharsis, and that the program has already been charted by HRC, her primary consultant, Ira Magaziner, and the 500-plus task force members.

They define themselves in terms of what they oppose.

In an effort to determine precisely who is on the Task Force for Health Care Reform, the *Wall Street Journal* obtained a list reluctantly supplied by the administration. Surprise! Bureaucrats—almost all are currently working in HCFA, HHS, other administration posts, and on Congressional staffs, plus a few academic wonks. Knowledgeable outsiders could find no (zero) representatives of organized medicine, managed health care, hospital associations, manufacturers of medical equipment and pharmaceuticals, not even any self-appointed consumer advocates (Sidney Wolfe/Ralph Nader). In fact, it is gratingly obvious that no one with true job experience in the field of medical care was invited to join the team. It might appear to some that our new administration has an attitude problem.

A patient will believe anything so long as it is not founded on medical science.

In treating our clientele, physicians labor under the assumption that patients are following a therapeutic program. However, studies have revealed that only 1/3 of patients use medications as prescribed, 1/3 use our prescription now and then, and 1/3 do not use medication at all. Furthermore, according to the *New England Journal of Medicine*, at least 1/3 of adults turn to alternative forms of therapy, e.g. acupuncture, biofeedback, massage therapy, chiropractic, aromatherapy, crystals and herbal compounds. On Maui, mother's milk remains a staple for treating the red eye. Of those patients who resort to alternative measures, fully 3/4 do not inform their medical doctor of such action.

Ninety percent give the other ten percent a bad name. The appropriate phrase is "Transfer of Wealth."

What it means is that income is shifted from the producers to the nonproducers. For the first time in American recorded history, in 1992 the number of employees working for federal, state and local governments surpassed the number of manufac-

turing jobs in the private sector. Military personnel are excluded. Supporting this government workforce requires the average family to pay \$16,110 in taxes each year. Hear the echo of the words from *Walden Pond*, "That government is best which governs least."

You can't say civilization isn't advancing.

They find new ways to kill you everyday. The fundamental Hippocratic approbation is "Do thou no harm." It would follow, therefore, that the ethical practice of medicine is concerned only with doing good, while respecting the personal rights and wishes of the individual patient. How shocking that 3 physicians were shot and wounded in the emergency room at LA County General Hospital by a disgruntled former patient. And in Pensacola, Florida, a physician, legally practicing medicine, was shot and killed by a self-appointed executioner. That such actions can occur might be explained as the vagaries of a demented mind, but the frightening aspect of the Florida episode was the callous statement of a few right-to-life(?) proponents that the executioner was justified!

The last time I voted was 1964; I voted for LBJ the peace candidate.

With the whittling down of the military, the need for health care personnel also has decreased. But what will the military do in the event of a national emergency? Medical care readiness has always been considered an "Achilles' heel" by the Pentagon, and legislation was proposed in 1986 requiring peacetime registration of physicians. Heavy lobbying by the AMA defeated that measure. Not to be undone, proponents of a draft bill slipped a version through Congress in 1987 allowing the Selective Service to develop a crisis plan. Therefore, a plan is now being devised to conscript health-care workers in the event of a national emergency, especially thousands of physicians under the age of 44. Targeted as the first to go would be young orthopedists, general surgeons and anesthesiologists, while the least likely would be internists, FPs, Ob-Gyns, and pediatricians. Of course, it is all on paper and would require the action of Congress and the President before becoming effective, but the Pentagon is thinking of you, and remember there are 5 sides to every Pentagon question.

Addenda

- ▲ Absurd recommendation on cataract guidelines, "Dilate the pupil to delay surgery!"
- ▲ Roman patricians overcame presbyopia by having their slaves read to them.
- ▲ If you happen to injure a groin muscle, be sure it isn't your own.

Aloha and keep the faith,

RTS



WHO? WHAT IS HPAS?

Hawaii Patient Accounting Services is Hawaii's Finest state-of-the-art patient billing and collection service!

Most vendors of medical billing software promise you **freedom from paperwork** and **more time for patient care**.

But you still have to learn how to use their software, register patients, enter charges and payments, print claims, print statements, print reports, stock forms, do backups, etc...

Then, when insurance companies make changes, you have to contact the software vendor to make the necessary enhancements (not to mention **probably** paying for them!).

We at Hawaii Patient Accounting Services (HPAS) know there is a better way:

Here's what YOU do

- Provide up-to-date patient registration information
- Provide a completed charge tag for each patient encounter
- See more patients
- Enjoy your leisure time

Here's what WE do

- Register your patients and enter charges, payments and adjustments in our state-of-the-art billing system
- File insurance claims weekly (electronically to HMSA, Medicaid, and Medicare)
- Post insurance payments (electronically from HMSA and Medicaid)
- Mail cycle billing statements to patients after their insurance has paid
- Resubmit claims when they are rejected or lost by the insurance company
- Answer your patients' billing inquiries
- Provide weekly and monthly practice management reports
- Generate automatic custom collection letters
- Assign delinquent accounts to collection agencies electronically
- Provide rates and reimbursement consulting
- Charge you a reasonable fee, probably less than what it currently costs you to perform these same tasks yourself

So, whether you do your billing manually or you already have a computerized billing system, you owe it to yourself to consider HPAS.

Hawaii Patient Accounting Services

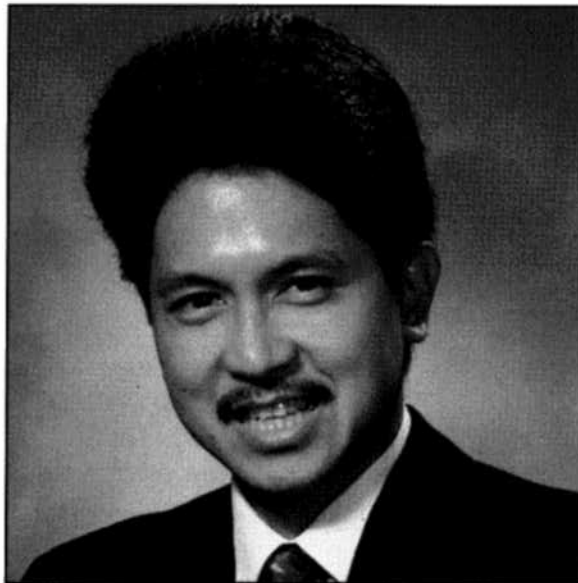
Bill Shanks • General Manager
P.O. Box 659, Waianae, Hawaii 96792-0659
(808) 696-1547

COMMITTED TO EXCELLENCE

The logo is a circular emblem with a stylized, flame-like or leaf-like border. At the top center, there is a small white circle containing the word "Roche" in a black, sans-serif font. Below this, the words "PRESIDENT'S ACHIEVEMENT AWARD" are written in a bold, black, sans-serif font, stacked in three lines.

ROCHE LABORATORIES presents the 1992 President's Achievement Award

Please join us in honoring this outstanding Roche representative who has distinguished himself by a truly exceptional level of professionalism, performance and dedication to quality healthcare. Throughout the year, this award-winning individual has consistently exemplified the Roche Commitment to Excellence and we're proud to invite you to share in congratulating him on his achievement.



*Wilfredo S. Salvador
Honolulu, Hawaii*

CLASSIFIED NOTICES

To place a Classified Notice, MEMBERS, please call Association Office at 536-7702. NON-MEMBERS, please call Leilani at 521-0021.
4 line minimum, approximately 5 words per line. Payment must accompany order.

EMPLOYMENT OPPORTUNITY

POSITIONS AVAILABLE

Physician Placement Hawaii has openings for physicians & other medical professionals all across the U.S. Mainland as well as here in Hawaii. We also have candidates interested in a Hawaii position. Call Earl Pajari at 395-7099.

FP/GP

For resort medical office. Send CV to Dr. Ben Azman, West Maui Healthcare Center, Kaanapali Maui, HI 96761 or ph.1-808-667-9721.

OFFICES

WAIKALANI PLAZA (Miiilani area)
Proposed Office & Commercial Center.
Long term with reasonable rates.
JIM ANDERSON REALTY 537-6911

SERVICES

INSURANCE WOES?

Having trouble with insurance collections? We have over 15 years insurance experience. Call MEDCON today! 247-0591.

LOCUM TENENS PROVIDED

Internal Medicine and Family Practice available. Please contact Acute Care Medical Services. 262-4181.

LOCUM TENENS AVAILABLE

Family Practice, Pediatrics, Urgent Care.
No agency fees. Deal direct. 923-2981.

LOCUM TENENS: Coverage for family practice, pediatrics and internal medicine. I can cover your medical office practice during your vacation and CME leave. For further information contact: Ruby De Alday, M.D., Family Practice, 2452 Tusitala St. PH #3, Honolulu, HI 96815, Ph. (808) 926-4078

RENTALS

WAIMANALO, OAHU BEACHFRONT

Beautiful beach home on magnificent white sand beach. Sleeps 8, \$1500/week, Barbara, 733 Bishop, Ste. 1800, HNL, HI 96813; 808-531-1411

If you do business in Hawaii...

and find it valuable to know who's suing who or who's getting hit with tax liens, going bankrupt, getting incorporated, selling property, being dissolved, or getting promoted
**...we have
news for you**



For information call 521-0021

MEDICAL A*B*C: A Tool For Tomorrow From A Company That Wasn't Born Yesterday...

Pacific Software Inc.

Solutions for Hawaii's Physicians



- Designed and Developed in Hawaii.
- Largest Supplier of Office Management Systems in the State.
- Systems for Every Sized Practice.
- Data Processing Service.
- Servicing Hawaii's Medical Community since 1981.

Pacific Software Building • 537 Pensacola Street • Honolulu, Hawaii 96814 • (808) 521-2800

PRAVACHOL® (Pravastatin Sodium Tablets) CONTRAINDICATIONS

Hypersensitivity to any component of this medication.

Active liver disease or unexplained, persistent elevations in liver function tests (see WARNINGS).

Pregnancy and lactation. Atherosclerosis is a chronic process and discontinuation of lipid-lowering drugs during pregnancy should have little impact on the outcome of long-term therapy of primary hypercholesterolemia. Cholesterol and other products of cholesterol biosynthesis are essential components for fetal development (including synthesis of steroids and cell membranes). Since HMG-CoA reductase inhibitors decrease cholesterol synthesis and possibly the synthesis of other biologically active substances derived from cholesterol, they may cause fetal harm when administered to pregnant women. Therefore, HMG-CoA reductase inhibitors are contraindicated during pregnancy and in nursing mothers. **Pravastatin should be administered to women of childbearing age only when such patients are highly unlikely to conceive and have been informed of the potential hazards.** If the patient becomes pregnant while taking this class of drug, therapy should be discontinued and the patient apprised of the potential hazard to the fetus.

WARNINGS

Liver Enzymes: HMG-CoA reductase inhibitors, like some other lipid-lowering therapies, have been associated with biochemical abnormalities of liver function. Increases of serum transaminase (ALT, AST) values to more than 3 times the upper limit of normal occurring on 2 or more (not necessarily sequential) occasions have been reported in 1.3% of patients treated with pravastatin in the U.S. over an average period of 18 months. These abnormalities were not associated with cholestasis and did not appear to be related to treatment duration. In those patients in whom these abnormalities were believed to be related to pravastatin and who were discontinued from therapy, the transaminase levels usually fell slowly to pretreatment levels. These biochemical findings are usually asymptomatic although worldwide experience indicates that anorexia, weakness, and/or abdominal pain may also be present in rare patients.

As with other lipid-lowering agents, liver function tests should be performed during therapy with pravastatin. Serum aminotransferases, including ALT (SGPT), should be monitored before treatment begins, every six weeks for the first three months, every eight weeks during the remainder of the first year, and periodically thereafter (e.g., at about six-month intervals). Special attention should be given to patients who develop increased transaminase levels. Liver function tests should be repeated to confirm an elevation and subsequently monitored at more frequent intervals. If increases in AST and ALT equal or exceed three times the upper limit of normal and persist, then therapy should be discontinued. Persistence of significant aminotransferase elevations following discontinuation of therapy may warrant consideration of liver biopsy.

Active liver disease or unexplained transaminase elevations are contraindications to the use of pravastatin (see CONTRAINDICATIONS). Caution should be exercised when pravastatin is administered to patients with a history of liver disease or heavy alcohol ingestion (see CLINICAL PHARMACOLOGY: Pharmacokinetics/Metabolism). Such patients should be closely monitored, started at the lower end of the recommended dosing range, and titrated to the desired therapeutic effect.

Skeletal Muscle: Rhabdomyolysis with renal dysfunction secondary to myoglobinuria has been reported with pravastatin and other drugs in this class. Uncomplicated myalgia has also been reported in pravastatin-treated patients (see ADVERSE REACTIONS). Myopathy, defined as muscle aching or muscle weakness in conjunction with increases in creatine phosphokinase (CPK) values to greater than 10 times the upper limit of normal was reported to be possibly due to pravastatin in only one patient in clinical trials (<0.1%). Myopathy should be considered in any patient with diffuse myalgias, muscle tenderness or weakness, and/or marked elevation of CPK. Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever. **Pravastatin therapy should be discontinued if markedly elevated CPK levels occur or myopathy is diagnosed or suspected. Pravastatin therapy should also be temporarily withheld in any patient experiencing an acute or serious condition predisposing to the development of renal failure secondary to rhabdomyolysis, e.g., sepsis; hypotension; major surgery; trauma; severe metabolic, endocrine, or electrolyte disorders; or uncontrolled epilepsy.**

The risk of myopathy during treatment with lovastatin is increased if therapy with either cyclosporine, gemfibrozil, erythronycin, or niacin is administered concurrently. There is no experience with the use of pravastatin together with cyclosporine. Myopathy has not been observed in clinical trials involving small numbers of patients who were treated with pravastatin together with niacin. One trial of limited size involving combined therapy with pravastatin and gemfibrozil showed a trend toward more frequent CPK elevations and patient withdrawals due to musculoskeletal symptoms in the group receiving combined treatment as compared with the groups receiving placebo, gemfibrozil, or pravastatin monotherapy. Myopathy was not reported in this trial (see PRECAUTIONS: Drug Interactions). One patient developed myopathy when clofibrate was added to a previously well tolerated regimen of pravastatin; the myopathy resolved when clofibrate therapy was stopped and pravastatin treatment continued. **The use of fibrates alone may occasionally be associated with myopathy. The combined use of pravastatin and fibrates should generally be avoided.**

PRECAUTIONS

General: Pravastatin may elevate creatine phosphokinase and transaminase levels (see ADVERSE REACTIONS). This should be considered in the differential diagnosis of chest pain in a patient on therapy with pravastatin.

Homozygous Familial Hypercholesterolemia. Pravastatin has not been evaluated in patients with rare homozygous familial hypercholesterolemia. In this group of patients, it has been reported that HMG-CoA reductase inhibitors are less effective because the patients lack functional LDL receptors.

Renal Insufficiency. A single 20 mg oral dose of pravastatin was administered to 24 patients with varying degrees of renal impairment (as determined by creatinine clearance). No effect was observed on the pharmacokinetics of pravastatin or its 3 α -hydroxy isomeric metabolite (SQ 31,906). A small increase was seen in mean AUC values and half-life (t_{1/2}) for the inactive enzymatic ring hydroxylation metabolite (SQ 31,945). Given this small sample size, the degree administered, and the degree of individual variability, patients with renal impairment who are receiving pravastatin should be closely monitored.

Information for Patients: Patients should be advised to report promptly unexplained muscle pain, tenderness or weakness, particularly if accompanied by malaise or fever.

Drug Interactions: Immunosuppressive Drugs, Gemfibrozil, Niacin (Nicotinic Acid), Erythromycin: See WARNINGS: Skeletal Muscle.

Antipyrine: Clearance by the cytochrome P450 system was unaltered by concomitant administration of pravastatin. Since pravastatin does not appear to induce hepatic drug-metabolizing enzymes, it is not expected that any significant interaction of pravastatin with other drugs (e.g., phenytoin, quinidine) metabolized by the cytochrome P450 system will occur.

Cholestyramine/Colestipol: Concomitant administration resulted in an approximately 40 to 50% decrease in the mean AUC of pravastatin. However, when pravastatin was administered 1 hour before or 4 hours after cholestyramine or 1 hour before colestipol and a standard meal, there was no clinically significant decrease in bioavailability or therapeutic effect. (See DOSAGE AND ADMINISTRATION: Concomitant Therapy.)

Warfarin: In a study involving 10 healthy male subjects given pravastatin and warfarin concomitantly for 6 days, bioavailability parameters at steady state for pravastatin (parent compound) were not altered. Pravastatin did not alter the plasma protein-binding of warfarin. Concomitant dosing did increase the AUC and C_{max} of warfarin but did not produce any changes in its anticoagulant action (i.e., no increase was seen in mean prothrombin time after 6 days of concomitant therapy). However, bleeding and extreme prolongation of prothrombin time has been reported with another drug in this class. Patients receiving warfarin-type anticoagulants should have their prothrombin times closely monitored when pravastatin is initiated or the dosage of pravastatin is changed.

Cimetidine: The AUC_{0-12h} for pravastatin when given with cimetidine was not significantly different from the AUC for pravastatin when given alone. A significant difference was observed between the AUC's for pravastatin when given with cimetidine compared to when administered with antacid.

Digoxin: In a crossover trial involving 18 healthy male subjects given pravastatin and digoxin concurrently for 9 days, the bioavailability parameters of digoxin were not affected. The AUC of pravastatin tended to increase, but the overall bioavailability of pravastatin plus its metabolites SQ 31,906 and SQ 31,945 was not altered.

Gemfibrozil: In a crossover study in 20 healthy male volunteers given concomitant single doses of pravastatin and gemfibrozil, there was a significant decrease in urinary excretion and protein binding of pravastatin. In addition, there was a significant increase in AUC, C_{max}, and T_{max} for the pravastatin metabolite SQ 31,906. Combination therapy with pravastatin and gemfibrozil is generally not recommended.

In interaction studies with aspirin, antacids (1 hour prior to PRAVACHOL), cimetidine, nicotinic acid, or probucol, no statistically significant differences in bioavailability were seen when PRAVACHOL (pravastatin sodium) was administered.

Other Drugs: During clinical trials, no noticeable drug interactions were reported when PRAVACHOL was added to: diuretics, antihypertensives, digitalis, converting-enzyme inhibitors, calcium channel blockers, beta-blockers, or nitroglycerin.

Endocrine Function: HMG-CoA reductase inhibitors interfere with cholesterol synthesis and lower circulating cholesterol levels and, as such, might theoretically blunt adrenal and/or gonadal steroid hormone production. Results of clinical trials with pravastatin in males and post-menopausal females were inconsistent with regard to possible effects of the drug on basal steroid hormone levels. In a study of 21 males, the mean testosterone response to human chorionic gonadotropin was significantly reduced (p<0.004) after 16 weeks of treatment with 40 mg of pravastatin. However, the percentage of patients showing a \geq 0.04% rise in plasma testosterone after human chorionic gonadotropin stimulation did not change significantly after therapy in these patients. The effects of HMG-CoA reductase inhibitors on spermatogenesis and fertility have not been studied in adequate numbers of patients. The effects, if any, of pravastatin on the pituitary-gonadal axis in pre-menopausal females are unknown. Patients treated with pravastatin who display clinical evidence of endocrine dysfunction should be evaluated appropriately. Caution should also be exercised if an HMG-CoA reductase inhibitor or other agent used to lower cholesterol levels is administered to patients also receiving other drugs (e.g., ketoconazole, spironolone, cimetidine) that may diminish the levels or activity of steroid hormones.

CNS Toxicity: CNS vascular lesions, characterized by perivascular hemorrhage and edema and mononuclear cell infiltration of perivascular spaces, were seen in dogs treated with pravastatin at a dose of 25 mg/kg/day, a dose that produced a plasma drug level about 50 times higher than the mean drug level in humans taking 40 mg/day. Similar CNS vascular lesions have been observed with several other drugs in this class.

A chemically similar drug in this class produced optic nerve degeneration (Wallerian degeneration of reti-

culum fibers) in clinically normal dogs in a dose-dependent fashion starting at 60 mg/kg/day, a dose that produced mean plasma drug levels about 30 times higher than the mean drug level in humans taking the highest recommended dose (as measured by total enzyme inhibitory activity). This same drug also produced vestibulocochlear (Wallerian-like degeneration and retinal ganglion cell chromatolysis) in dogs treated for 14 weeks at 180 mg/kg/day, a dose which resulted in a mean plasma drug level similar to that seen with the 60 mg/kg/day dose.

Carcinogenesis, Mutagenesis, Impairment of Fertility: In a 2-year study in rats fed pravastatin at doses of 10, 30, or 100 mg/kg body weight, there was an increased incidence of hepatocellular carcinomas in males at the highest dose (p<0.01). Although rats were given up to 125 times the human dose (HD) on a mg/kg body weight basis, their serum drug levels were only 6 to 10 times higher than those measured in humans given 40 mg pravastatin as measured by AUC.

The oral administration of 10, 30, or 100 mg/kg (producing plasma drug levels approximately 0.5 to 5.0 times human drug levels at 40 mg) of pravastatin to mice for 22 months resulted in a statistically significant increase in the incidence of malignant lymphomas in treated females when all treatment groups were pooled and compared to controls (p<0.05). The incidence was not dose-related and male mice were not affected.

A chemically similar drug in this class was administered to mice for 72 weeks at 25, 100, and 400 mg/kg body weight, which resulted in mean serum drug levels approximately 3, 15, and 33 times higher than the mean human serum drug concentration (as total inhibitory activity) after a 40 mg oral dose. Liver carcinomas were significantly increased in high-dose females and mid- and high-dose males, with a maximum incidence of 90 percent in males. The incidence of adenomas of the liver was significantly increased in mid- and high-dose females. Drug treatment also significantly increased the incidence of lung adenomas in mid- and high-dose males and females. Adenomas of the eye (Harderian gland (a gland of the eye of rodents) were significantly higher in high-dose mice than in controls.

No evidence of mutagenicity was observed *in vitro*, with or without rat-liver metabolic activation, in the following studies: microbial mutagen tests, using mutant strains of *Salmonella typhimurium* or *Escherichia coli*; a forward mutation assay in L5178Y TK⁺ cells; mouse lymphoma cells; a chromosomal aberration test in hamster cells; and a gene conversion assay using *Saccharomyces cerevisiae*. In addition, there was no evidence of mutagenicity in either a dominant lethal test in mice or a micronucleus test in mice.

In a study in rats, with daily doses up to 500 mg/kg, pravastatin did not produce any adverse effects on fertility or general reproductive performance. However, in a study with another HMG-CoA reductase inhibitor, there was decreased fertility in male rats treated for 34 weeks at 25 mg/kg body weight, although this effect was not observed in a subsequent fertility study when this same dose was administered for 11 weeks (the entire cycle of spermatogenesis, including epididymal maturation). In rats treated with this same reductase inhibitor at 180 mg/kg/day, seminiferous tubule degeneration (necrosis and loss of spermatogenic epithelium) was observed. Although not seen with pravastatin, two similar drugs in this class caused drug-related testicular atrophy, decreased spermatogenesis, spermatocytic degeneration, and giant cell formation in dogs. The clinical significance of these findings is unclear.

Pregnancy: Pregnancy Category X: See CONTRAINDICATIONS.

Safety in pregnant women has not been established. Pravastatin was not teratogenic in rats at doses up to 1000 mg/kg daily or in rabbits at doses of up to 50 mg/kg daily. These doses resulted in 20x (rabbit) or 240x (rat) the human exposure based on surface area (mg/meter²). However, in studies with another HMG-CoA reductase inhibitor, skeletal malformations were observed in rats and mice. PRAVACHOL (pravastatin sodium) should be administered to women of child-bearing potential only when such patients are highly unlikely to conceive and have been informed of the potential hazards. If the woman becomes pregnant while taking PRAVACHOL (pravastatin sodium), it should be discontinued and the patient advised again as to the potential hazards to the fetus.

Nursing Mothers: A small amount of pravastatin is excreted in human breast milk. Because of the potential for serious adverse reactions in nursing infants, women taking PRAVACHOL should not nurse (see CONTRAINDICATIONS).

Pediatric Use: Safety and effectiveness in individuals less than 18 years old have not been established. Hence, treatment in patients less than 18 years old is not recommended at this time. (See also PRECAUTIONS: General.)

ADVERSE REACTIONS

Pravastatin is generally well tolerated; adverse reactions have usually been mild and transient. In 4-month long placebo-controlled trials, 1.7% of pravastatin-treated patients and 1.2% of placebo-treated patients were discontinued from treatment because of adverse experiences attributed to study drug therapy; this difference was not statistically significant. In long-term studies, the most common reasons for discontinuation were asymptomatic serum transaminase increases and mild, non-specific gastrointestinal complaints. During clinical trials the overall incidence of adverse events in the elderly was not different from the incidence observed in younger patients.

Adverse Clinical Events: All adverse clinical events (regardless of attribution) reported in more than 2% of pravastatin-treated patients in the placebo-controlled trials are identified in the table below, also shown are the percentages of patients in whom these medical events were believed to be related or possibly related to the drug:

| Body System/Event | All Events % | | Events Attributed to Study Drug % | |
|---------------------|---------------------|-----------------|-----------------------------------|-----------------|
| | Pravastatin (N=900) | Placebo (N=411) | Pravastatin (N=900) | Placebo (N=411) |
| Cardiovascular | | | | |
| Cardiac Chest Pain | 4.0 | 3.4 | 0.1 | 0.0 |
| Dermatologic | | | | |
| Rash | 4.0* | 1.1 | 1.3 | 0.9 |
| Gastrointestinal | | | | |
| Nausea/Vomiting | 7.3 | 7.1 | 2.9 | 3.4 |
| Diarrhea | 6.2 | 5.6 | 2.0 | 1.9 |
| Abdominal Pain | 5.4 | 6.9 | 2.0 | 3.9 |
| Constipation | 4.0 | 7.1 | 2.4 | 5.1 |
| Flatulence | 3.3 | 3.6 | 2.7 | 3.4 |
| Heartburn | 2.9 | 1.9 | 2.0 | 0.7 |
| General | | | | |
| Fatigue | 3.8 | 3.4 | 1.9 | 1.0 |
| Chest Pain | 3.7 | 1.9 | 0.3 | 0.2 |
| Influenza | 2.4* | 0.7 | 0.0 | 0.0 |
| Musculoskeletal | | | | |
| Localized Pain | 10.0 | 9.0 | 1.4 | 1.5 |
| Myalgia | 2.7 | 1.0 | 0.6 | 0.0 |
| Nervous System | | | | |
| Headache | 6.2 | 3.9 | 1.7* | 0.2 |
| Dizziness | 3.3 | 3.2 | 1.0 | 0.5 |
| Renal/Genitourinary | | | | |
| Urinary Abnormality | 2.4 | 2.9 | 0.7 | 1.2 |
| Respiratory | | | | |
| Common Cold | 7.0 | 6.3 | 0.0 | 0.0 |
| Rhinitis | 4.0 | 4.1 | 0.1 | 0.0 |
| Cough | 2.6 | 1.7 | 0.1 | 0.0 |

*Statistically significantly different from placebo.

The following effects have been reported with drugs in this class:

Skeletal: myopathy, rhabdomyolysis.

Neurological: dysfunction of certain cranial nerves (including alteration of taste, impairment of extra-ocular movement, facial paresis), tremor, vertigo, memory loss, paresthesia, peripheral neuropathy, peripheral nerve palsy.

Hypersensitivity Reactions: An apparent hypersensitivity syndrome has been reported rarely which has included one or more of the following features: anaphylaxis, angioedema, lupus erythematosus-like syndrome, polymyalgia rheumatica, vasculitis, purpura, thrombocytopenia, leukopenia, hemolytic anemia, positive ANA, ESR increase, arthritis, arthralgia, urticaria, asthenia, photosensitivity, fever, chills, flushing, malaise, dyspnea, toxic epidermal necrolysis, erythema multiforme, including Stevens-Johnson syndrome.

Gastrointestinal: pancreatitis, hepatitis, including chronic active hepatitis, cholestatic jaundice, fatty change in liver, and, rarely, cirrhosis, fulminant hepatic necrosis, and hepatoma; anorexia, vomiting.

Reproductive: gynecostasia, loss of libido, erectile dysfunction.

Eye: progression of cataracts (lens opacities), ophthalmoplegia.

Laboratory Test Abnormalities: Increases in serum transaminase (ALT, AST) values and CPK have been observed (see WARNINGS).

Transient, asymptomatic eosinophilia has been reported. Eosinophil counts usually returned to normal despite continued therapy. Anemia, thrombocytopenia, and leukopenia have been reported with other HMG-CoA reductase inhibitors.

Concomitant Therapy: Pravastatin has been administered concurrently with cholestyramine, colestipol, nicotinic acid, probucol and gemfibrozil. Preliminary data suggest that the addition of either probucol or gemfibrozil to therapy with lovastatin or pravastatin is not associated with greater reduction in LDL-cholesterol than that achieved with lovastatin or pravastatin alone. No adverse reactions unique to the combination or in addition to those previously reported for each drug alone have been reported. Myopathy and rhabdomyolysis (with or without acute renal failure) have been reported when another HMG-CoA reductase inhibitor was used in combination with immunosuppressive drugs, gemfibrozil, erythronycin, or lipid-lowering doses of nicotinic acid. Concomitant therapy with HMG-CoA reductase inhibitors and these agents is generally not recommended. (See WARNINGS: Skeletal Muscle and PRECAUTIONS: Drug Interactions.)

OVERDOSAGE

There have been no reports of overdoses with pravastatin.

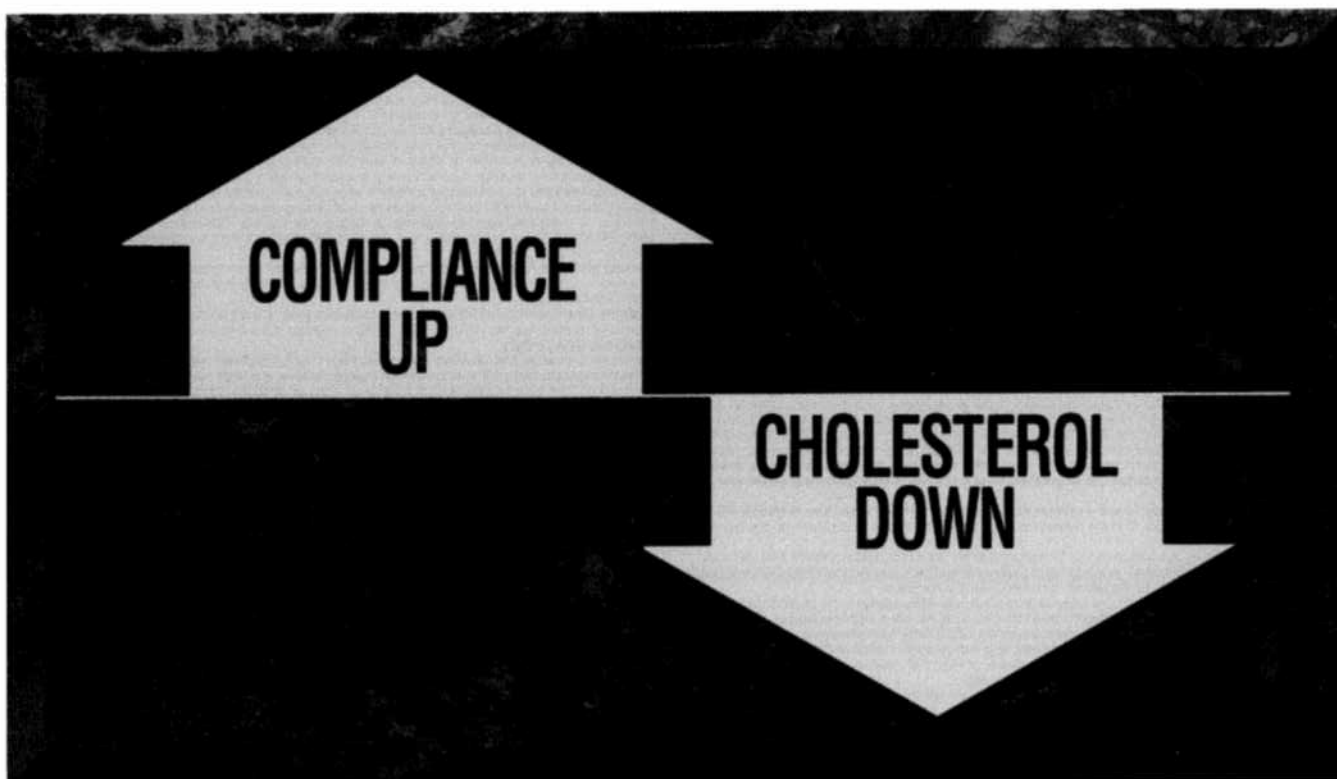
Should an accidental overdose occur, treat symptomatically and institute supportive measures as required. (J4-422A)

Introducing a new program that helps PRAVACHOL® patients get the most out of their therapy...

PRAVACHOL® (pravastatin sodium) 10 mg, 20 mg tablets

Partners

P R O G R A M™



*Introducing the Pravachol®
PARTNERS Program™,
exclusively for your patients
taking PRAVACHOL.*

Designed with the help of 250 physicians, this program was developed to enhance patients' commitment to your recommendations about diet, exercise and medication.

When patients join, they'll receive an informative, entertaining video— *Cholesterol: The Inside Story*, hosted by Regis Philbin and Kathie Lee Gifford— and a subscription to a motivational newsletter. They'll even receive savings on products and services that can help them maintain an enjoyable low-fat, low-cholesterol life-style.

And it's easy for you to help patients enroll— just call 1-800-572-1034 for information and a supply of enrollment forms.


PRAVACHOL®
pravastatin sodium 20 mg
tablets

 Bristol-Myers Squibb Company

PRAVACHOL is indicated as an adjunct to diet for the reduction of elevated total and LDL-cholesterol levels in patients with primary hypercholesterolemia (Types IIa and IIb) when the response to diet alone has not been adequate.

Please see following page for brief summary of full Prescribing Information.