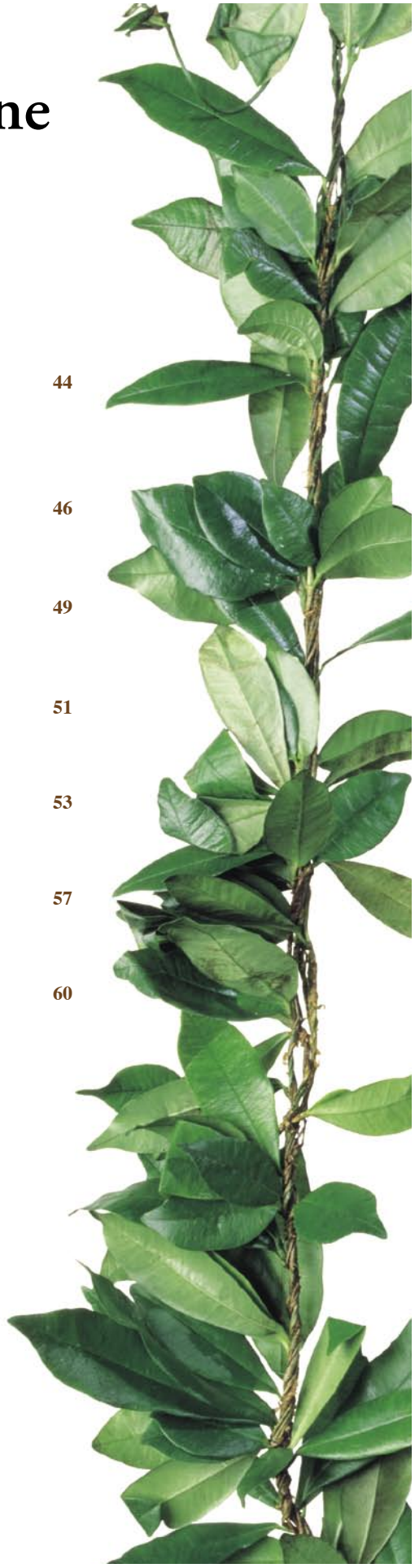
Hawai‘i Journal of Medicine & Public Health

A Journal of Asia Pacific Medicine & Public Health

February 2012, Volume 71, No. 2, ISSN 2165-8218



MIEC Belongs to Our Policyholders!

That Means They Receive The Profit Distributions, **$30,000,000** Dividend Declared in 2011 - A Company Record!

What other insurance company does that?

KEEPING TRUE TO OUR MISSION

In Hawaii this is an average savings on premiums of 44%* for 2012.

For more information or to apply contact:

- **www.miec.com or call 800.227.4527**
- **Email questions to underwriting@miec.com**

* (On premiums at $1/3 million limits. Future dividends cannot be guaranteed.)

MIEC 6250 Claremont Avenue, Oakland, California 94618 • 800-227-4527 • www.miec.com

UCERA_ad_12.29.11

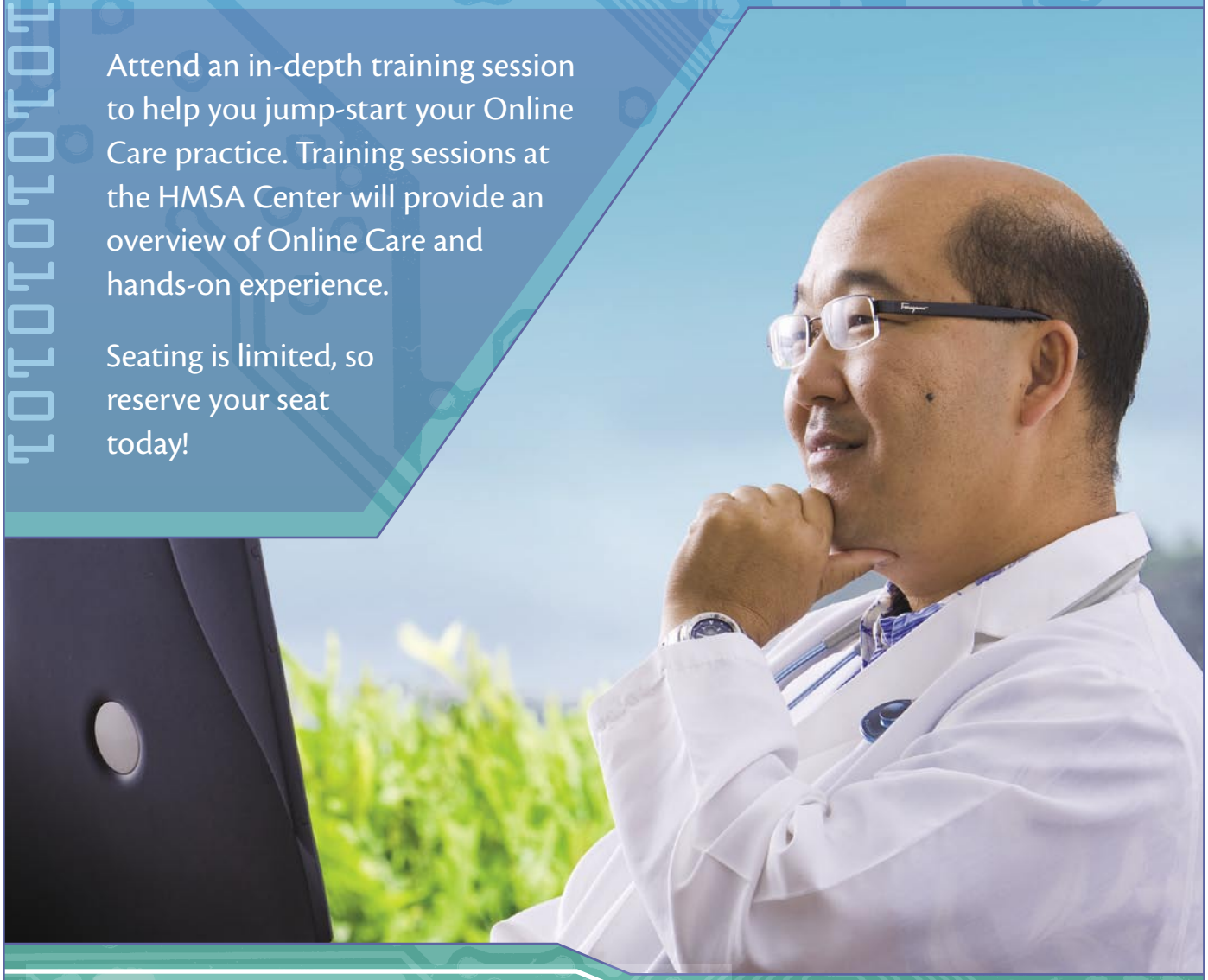
MIEC

Owned by the policyholders we protect.

Learn How to Practice Online with HMSA's Online Care!

Attend an in-depth training session to help you jump-start your Online Care practice. Training sessions at the HMSA Center will provide an overview of Online Care and hands-on experience.

Seating is limited, so reserve your seat today!



For training dates and to RSVP, go to **https://physiciansonline.hmsa.com/sign-up/.**

Please call HMSA's Online Care Help Desk at 948-6013 on Oahu or 1 (866) 939-6013 toll-free on the Neighbor Islands if you have any questions.

Note: You must be a participating provider with HMSA's Preferred Provider Plan (M.D.s, D.O.s, APRNs, certified nurse midwives, optometrists, podiatrists, psychologists, child psychologists, and psychiatric APRNs).

HMSA

Blue Cross Blue Shield of Hawai'i

An Independent Licensee of the Blue Cross and Blue Shield Association

hmsa.com

1010-2373

Hawai'i Journal of Medicine & Public Health

A Journal of Asia Pacific Medicine & Public Health

ISSN 2165-8218 (Print), ISSN 2165-8242 (Online)

The Journal's aim is to provide new scientific information in a scholarly manner, with a focus on the unique, multicultural, and environmental aspects of the Hawaiian Islands and Pacific Rim region.

Published by University Clinical, Education & Research Associates (UCERA)

Hawai'i Journal of Medicine & Public Health
677 Ala Moana Blvd., Suite 1016B
Honolulu, Hawai'i 96813
http://www.hjmph.org
Email: info@hjmph.org

The Hawai'i Journal of Medicine & Public Health was formerly two separate journals: The Hawai'i Medical Journal and the Hawai'i Journal of Public Health. The Hawai'i Medical Journal was founded in 1941 by the Hawai'i Medical Association (HMA), which was incorporated in 1856 under the Hawaiian monarchy. In 2009 the journal was transferred by HMA to University Clinical, Education & Research Associates (UCERA). The Hawai'i Journal of Public Health was a collaborative effort between the Hawai'i State Department of Health and the Office of Public Health Studies at the John A. Burns School of Medicine established in 2008.

Full text articles available on PubMed Central

Upcoming CME Events

Contact Brenda Wong at (808) 536-7702 x103.

Date	Specialty	Sponsor	Location	Meeting Topic	Contact
February 2012					
2/3-2/5	GE, HEP, NTR	University of Hawai'i John A. Burns School of Medicine	Hawai'i Prince Hotel, O'ahu	Clinical Updates in Gastroenterology, Hepatology & Nutrition - Hawai'i 2012	Web: www.uhmed.org/index.php/gi-conference
2/5-2/10	GS	Mayo Clinic	Grand Hyatt Kaua'i, Kaua'i	Mayo Clinic Interactive Surgery Symposium 2012	Web: www.mayo.edu/cme
April 2012					
4/20	GYN, ON, GO	University of Hawai'iJohn A. Burns School of Medicine	Ala Moana Hotel, O'ahu	Gynecologic Oncology Conference 2012	Email: jlouis@ucera.org
July 2012					
7/29-8/2	ORS, OSM, OTR	Kaiser Permanente	Grand Hyatt Kaua'i, Kaua'i	29th Annal Update in Orthopaedic Surgery Conference	Email: kpos@sbcglobal.net

Methamphetamine-Induced Paralytic Ileus

Terri L Carlson DO; Timothy P. Plackett DO; Ronald A. Gagliano Jr. MD; and Richard R. Smith MD

Abstract

Methamphetamine abuse has become a significant problem in the United States with recent surveys reporting that nearly 10 million Americans have tried methamphetamine at least once. Methamphetamine is a stimulant drug that causes the release of monoamine neurotransmitters. Among its most deleterious effects are its ability to produce tachycardia, hypertension, and ischemia. However, it also has the potential to cause clinically significant effects outside of the cardiovascular system although a case of paralytic ileus caused by methamphetamine use has not been described before in the literature. Described is a case in which a patient presented with chest and abdominal pain after methamphetamine use. The patient was ultimately diagnosed with a methamphetamine-induced paralytic ileus.

Introduction

Crystal meth (methamphetamine hydrochloride) is a stimulant which produces a rapid and intense "high" secondary to release of the monoamine neurotransmitters dopamine, serotonin, and norepinepherine.[1] The drug's potentially therapeutic effects include alertness, energy, euphoria, and suppression of appetite.[2] However, it has multiple harmful effects on the cardiovascular and gastrointestinal systems. The rapid release of norepinephrine results in activation of alpha-1 receptors and vasoconstriction.[3] Depending on the duration and severity of this vasoconstriction ischemia can result. Additionally, independent of its actions on the cardiovascular system, methamphetamine can also effect the gastrointestinal system through direct affects on cocaine-regulate and amphetamine-regulate transcript (CART) peptide as well as indirect effects from the release of dopamine and other neurotransmitters.[4,5] Herein, we present a case of methamphetamine-induced ileus and describe the biochemical and neurologic mechanisms of this process.

Case Report

A 19-year-old man was seen in an acute care clinic for right-sided chest pain after a morning run and was found to have sinus tachycardia with a rate of 138 beats per minute. He was subsequently transferred to the emergency department for further care. On arrival his chest pain had resolved, but he now had focal right lower quadrant abdominal pain (described as a sharp, stabbing pain without radiation) and anorexia. He denied having any other symptoms and he was otherwise healthy. He admitted to having been drinking alcohol the night before, but initially denied using any illicit drugs. His physical exam was remarkable for tenderness to palpation in the right lower quadrant, diminished bowel sounds, and the absence of peritoneal signs. His laboratory analysis was remarkable for a white blood cell count of 22.0 x 10^9 cells/L with 85% neutrophils, arterial pH of 7.44, $PaCO_2$ of 27 mmHg, serum bicarbonate of 16 mmol/L, and base deficit of 6 mmol/L. His urine drug screen demonstrated the presence of amphetamines, and confirmatory testing determined the origin to be methamphetamine. An abdominal X-ray series demonstrated the presence of air throughout the small intestine, appendix, and colon (Figure 1). A CT scan demonstrated similar findings to the X-ray; of note it was without evidence of ischemic changes to the bowel. The patient was admitted to the hospital for a methamphetamine-induced ileus and observed for 48 hours. After correction of his physiologic abnormalities and consultation with the psychiatric service for drug abuse counseling he was discharged from the hospital.

Discussion

The majority of catastrophic complications of methamphetamine use are caused by the rapid and sustained release of norepinephrine and its effects on the cardiovascular system. The release of norepinephrine results in arterial vasoconstriction via alpha-1 receptors and increased chronotropy and inotropy via beta-1 rectepors.[3] These effects produce the tachycardia and hypertension characteristic of methamphetamine use. If severe enough this can result in cardiac ischemia. Similar effects can also be seen in the mesenteric vessels, as demonstrated by the many case reports of methamphetamine-inducted acute mesenteric ischemia.[6,7]

This case highlights the ability of methamphetamines to have non-vascular effects as well. The mechanism by which methamphetamines can induce an ileus is only partially understood. We believe this is the first described case. The potential for a direct effect on the gastrointestinal system has been proposed by the discovery of the cocaine and amphetamine regulated transcript (CART) receptor in the stomach, small intestine, and large intestine.[8] While early studies suggested that CART may play a role in gastrointestinal motility, more recent studies have questioned these findings and suggest that it has limited to no effects on an otherwise normal enteric system.[9] Rather, the role of CART within the enteric tract may be for remodeling after injury or in the presence of chronic derangements. The more likely source of the ileus is through the methadone-mediated release of dopamine and norepinephrine. Activation of the dopamine-1 receptor results in a significant decrease in small bowel contractility and alteration of the migratory motor complex.[4,10] Additionally, norepinephrine is also know to alter the enteric nervous system, resulting in a decrease in enteric muscle tone.[3] These decreases in neurologic function result in the lack of enteric tone characteristic of ileus.

Finally, this case adds to the large differential of causes for right lower quadrant abdominal pain. Although the patient had many features that initially suggested that he may have appendicitis (tenderness in the right lower quadrant, leukocytosis with granulocytosis, and anorexia), careful review of the initial

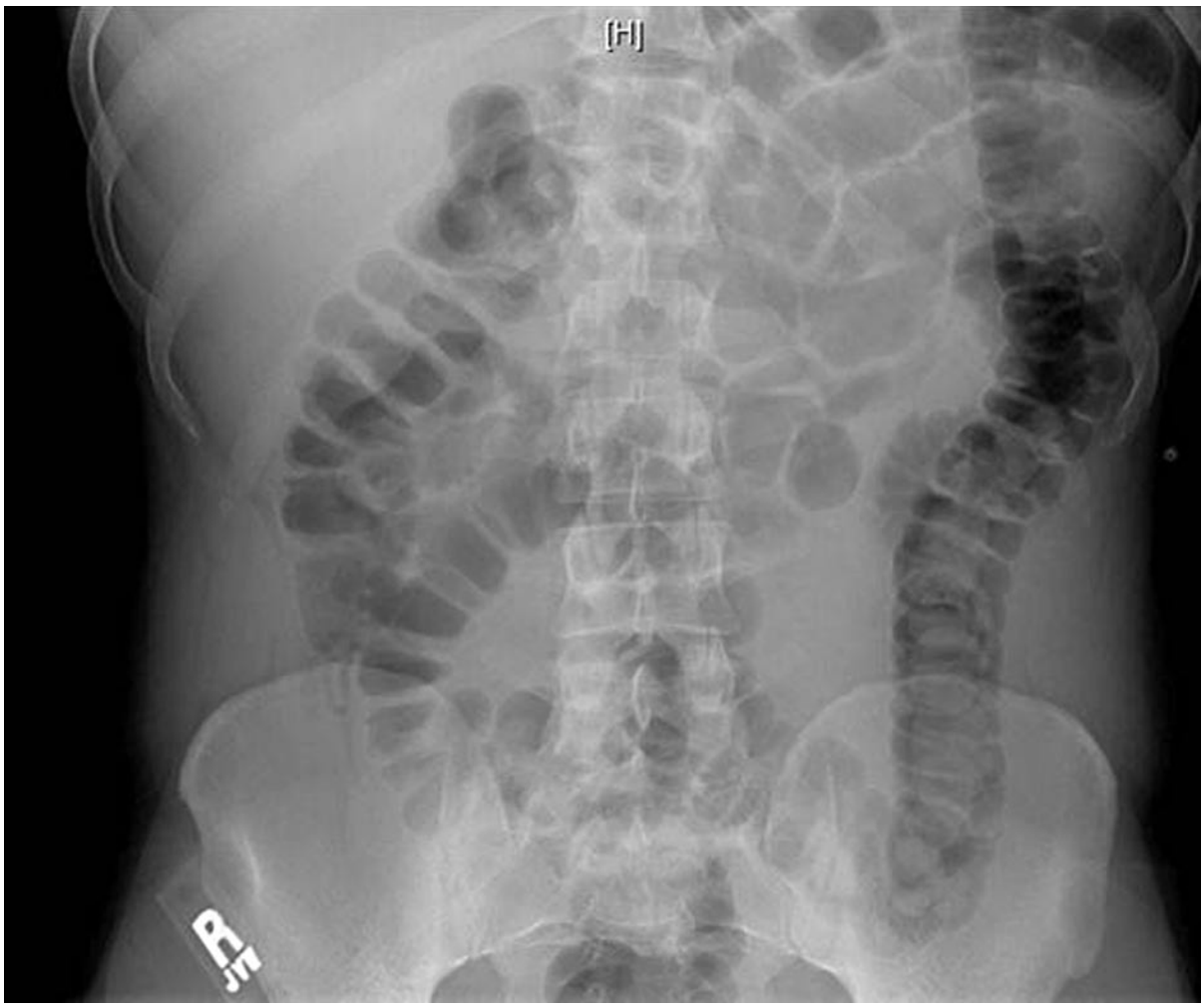


Figure 1. Abdominal X-ray showing dilated loops of bowel with intra-appendiceal air.

radiologic imaging demonstrated the presence of an air-filled appendix, thereby excluding this as a diagnosis. While methamphetamine-induced paralytic ileus may be a rare entity, given the prevalence of methamphetamine abuse, it should remain within the physician's differential diagnosis.

The views expressed in this manuscript are those of the authors and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the US Government.

Conflict of Interest Statement

None of the authors identify any conflict of interest.

Authors' Affiliation:
- Department of Surgery, Tripler Army Medical Center, Honolulu, HI (TLC, RAG RRS)
- Department of Surgery, Womack Army Medical Center, Fort Bragg, NC (TPP)

Correspondence to:
Timothy Plackett DO; Department of Surgery, Womack Army Medial Center,
2817 Reilly Road, Fort Bragg, NC 28310; Email: timothy.plackett@us.army.mil

References

1. Kish SJ. Pharmacologic mechanism of crystal meth. *CMAJ.* 2008;178:1679-1682.
2. Linberry TW, Bostwisk JM. Methamphetamine abuse: a perfect storm of complications. *Mayo Clinic Proc.* 2006;81:77-84.
3. Dunser MW, Hasibeder WR. Sympathetic overstimulation during critical illness: adverse effects of adrenergic stress. *J Intensive Care Med.* 2009;24:293-316.
4. Dive A, Foret F, Jamart J, Bulpa P, Installe E. Effect of dopamine on gastrointestinal motility during critical illness. *Intensive Care Med.* 2000;26:901-907.
5. Tebbe JJ, Ortmann E, Schumacker K, Monnikes H, Kobelt P, Arnold R, et al. Cocaine- and amphetamine-regulated transcript stimulates colonic motility via central CRF receptor activation and peripheral cholinergic pathways in fed, conscious rats. *Neurogastroenterol Motil.* 2004;16:489-496.
6. Brannan TA, Soundararajan S, Houghton BL. Methamphetamine-associated shock with intestinal infarction. *MedGenMed.* 2004;6:6.
7. Herr RD, Caravati EM. Acute transient ischemic colitis after oral methamphetamine ingestion. *Am J Emerg Med.*1991;9:406-409.
8. Ekblad E, Kuhar M, Wierup N, Sundler F. Cocaine- and amphetamine-regulated transcript: distribution and function in rat gastrointestinal tract. *Neurogastroenterol Motil.* 2003;15:545-557.
9. Ekblad E. CART in the enteric nervous system. *Peptides.* 2006;27:2024-2030.
10. Zizzo MG, Mule F, Mastropaolo M, Serio R. D1 receptors play a major role in the dopamine modulation of mouse ileum contractility. *Pharmacol Res.* 2010;61:371-378.

Science in Liquid Dietary Supplement Promotion: The Misleading Case of Mangosteen Juice

Ano L. Lobb MPH

Abstract

Liquid dietary supplements represent a fast growing market segment, including botanically-based beverages containing mangosteen, acai, and noni. These products often resemble fruit juice in packaging and appearance, but may contain pharmacologically active ingredients. While little is known about the human health effects or safety of consuming such products, manufacturers make extensive use of low-quality published research to promote their products. This report analyzes the science-based marketing claims of two of the most widely consumed mangosteen liquid dietary supplements, and compares them to the findings of the research being cited. The reviewer found that analyzed marketing claims overstate the significance of findings, and fail to disclose severe methodological weaknesses of the research they cite. If this trend extends to other related products that are similarly widely consumed, it may pose a public health threat by misleading consumers into assuming that product safety and effectiveness are backed by rigorous scientific data.

Keywords

Dietary supplement, mangosteen, nutraceutical

Introduction

Nutraceutical juice beverages containing tropical botanicals such as acai, noni, and mangosteen are a fast growing portion of the $23 billion "functional and natural ready-to-drink beverage" market.[1] While they look like everyday beverages in packaging and appearance, these so-called "super food" beverages may also be classified and promoted as liquid dietary supplements.[2] Some of their botanical ingredients may also contain potent pharmacoactive ingredients. Xanthone derivatives from mangosteen (garcinia mangostana), for example, have been investigated in-vitro for their potential antifungal, antibacterial, and cytotoxic effects.[3] Reliable evidence that such beverages are safe or promote health when consumed frequently by humans, however, is currently lacking.[3-5]

The larger field of nutrition research has been criticized for over-emphasizing health claims that are based on methodologically weak research and pseudoscience,[6] and the dietary supplement sector appears to follow this practice also. Nutraceutical juice beverages are widely marketed across all media as "super foods," with the Internet providing a convenient venue for sophisticated multimedia marketing presentations and easy product purchase. Central to the marketing of many products is the citation of "scientific studies" supporting the product's health claims. While these studies seem deliberately created for marketing purposes, their findings and quality are generally presented in a manner that appears designed to mislead potential consumers. This practice of using manufacturer funded, methodologically weak studies characterized by short duration and small sample size has been previously identified among dietary weight loss supplements, a closely related class of products.[7]

The Food and Drug Administration (FDA) has noted growth in this sector, and has voiced concerns about marketing practices, noting in guidance to industry that they "have seen an increase in the marketing of beverages as dietary supplements, in spite of the fact that the packaging and labeling of many liquid products represent the products as conventional foods."[8] Further, "FDA has seen a growth in the marketplace of beverages and other conventional foods that contain novel ingredients, such as added botanical ingredients or their extracts."[8]

Product websites offer rich marketing potential for dietary supplements, including the ability to quickly and easily purchase the advertised product. While labels for both dietary supplements and foods and beverages must comply with FDA regulations,[8-10] website marketing practices have much freer reign. Yet there are compelling reasons why misleading online promotion may be more influential than labels. For example, consumers may purchase a product after reading online marketing, or after "researching" healthy beverages online. Commonly used search engines such as Google may direct consumers seeking health information to such commercial sites. Also, consumers are likely to spend longer periods of time engaged with the often media-rich online environment than they do with a static product label. Further, the addresses for product websites are often prominently displayed on product labels, thus serving the function of virtual label extensions.

This case study presents examples of how widely marketed and consumed liquid dietary supplements use exaggeration and pseudoscience to bolster their web promotions of product effectiveness and safety.

Methods

Marketing claims from two leading producers of mangosteen dietary supplement were compared with the underlying published research that they cited.

Results

Mangosteen fruit juice is made from the fruit of the *Garcinia mangostana* plant, found in tropical climates of South East Asia.[4] The beverage is widely marketed for potent yet unproven health benefits attributed to its high antioxidant content.[5] These include claims, generally theoretical in nature and unsubstantiated by rigorous human trials, that the product ingredients: protects against free radicals, increase energy and stamina, support the immune system, promote a healthy digestive system, assist in recovery after exercise, and support joint and cartilage functionality.[1] A comparison of select marketing claims and the evidence cited in those claims is presented in Table 1.

Table 1. Fact Check of Marketing Statements Against Published Research, from Leading Mangosteen Juice Liquid Dietary Supplement Producers

Website Marketing	Published Study	Comments
Case Example 1		
• "8-week double-blind placebo-controlled human clinical" trial that have demonstrated an ability to reduce C-reactive protein levels at all 3 dosages." • "product was shown to be safe at all dosages tested. There were no adverse events (clinical, laboratory, or vital sign) attributed to the product during the course of the study." • Highest dosage cited: 9 oz. • States that product is "safe for everyone," suggests concomitant use of mangosteen supplement pill (see below). • Qualifications of lead researcher touted, but no mention of study funding source	• Study contained 40 participants randomized to 4 arms.[11] • Only the highest dosage and placebo demonstrated statistically significant "comparison of change from baseline." • Highest dosage: 18 oz. (9 oz twice daily). • Study funded by manufacturer.	• Study is underpowered to detect adverse events that might occur even as frequently as in 1% to 2% of users. • Suggesting that a product is safe because an underpowered study failed to report adverse events is inappropriate, especially when at least one published case report links mangosteen juice to a serious adverse event,[12] and a botanical relative (*Garcinia caombogia*) is a suspected hepatotoxin.[13] • Value of non statistically-significant trends overstated. • Underreporting actual daily dosage makes product appear more potent. • Not reporting financial conflicts of interest may bolster study's face validity.
Case Example 2		
• Abstract titled "The potential 'fat burning' effects of the liquid dietary supplement…" • Claims listed under heading "Science" and subhead "Most Requested Current Topic"	• Study is an unpublished conference presentation. • Findings are in-vitro effects theoretically linked to processes that may affect weight gain and loss in humans.	• Marketing claims may mislead consumers by suggesting that preliminary lab findings provide scientific support for weight loss associated with product use.
Mangosteen Dietary Supplement Pill		
• A "4-week placebo-controlled human clinical study" finds the supplement: • helps "maintain a healthy respiratory system in participants…demonstrated a significant extension of the participants' overall wellness when compared to the placebo group."	• The study is unpublished[14] • No information provided about study size, whether differences were statistically significant or not, or funding source.	• Marketing claims may mislead consumers by suggesting that there is rigorous scientific support for product effectiveness.

Discussion

Using methodologically weak studies, sometimes containing undeclared conflicts of interest, to validate dietary supplement use is nothing new.[6] That it may be done with a new class of liquid dietary supplements containing potentially potent pharmacological agents, whose outward appearance as fruit juice may inspire frequent consumption by consumers, is, however, a new and worrisome trend. In the interests of consumer safety and fair marketing, several stakeholders share a role in mitigating potential adverse effects. Manufacturers should abide by ethical marketing practices that do not misrepresent or overstate research findings or presumed safety of their products. This includes full disclosure of the size, duration, funding, and quality of research pertinent to claims supporting their products. Marketing practice that is compliant with current law is legally sufficient to avoid litigation, but lacking in basic social responsibility and good business practice. Clinicians need to be aware of the potential health risks associated with use of dietary supplements, inquire about the consumption of such products, and when necessary document cases of suspected adverse events both to the FDA and in the medical literature. Government regulators should examine industry use of scientific data and provide guidance about recommended use of such information for marketing purposes. Scientific publications should redouble their efforts to clearly and comprehensively disclose conflicts of interest. Consumers should avoid the temptation of looking to the latest super food as a solution for perceived or real health concerns, and of believing the frequent over-promotion of such products.

Conclusion

Liquid dietary supplements that are essentially fruit juices containing novel botanical ingredients may also contain pharmacologically active constituents. Though the true nature of health benefit and safety of these products has not generally been established in humans, some are widely implied as being of benefit, which is substantiated by "science." Limited, low quality research in the form of manufacturer-funded studies characterized by short duration and small sample size is frequently used to bolster marketing claims and allay fears of potential risks, and may amount to a misleading use of science. If this trend extends to other related products that are similarly widely consumed, it may pose a burgeoning public health threat by misleading consumers.

Conflict of Interest

The author reports no conflicts of interest related to this research.

Author's Affiliation:
- Senior Instructional Designer, Master of Health Care Delivery Science Program, Dartmouth College, Hanover NH

Correspondence to:
Ano Lobb MPH; 37 Dewey Field Rd HB 7253, Hanover NH, 03755;
Ph: (802) 279-7625; Email: ano.lobb@gmail.com

References

1. Wright R. The nutraceutical drink market: Thirsting for new ideas. *Nutraceuticals World*. 1 July 2011. Available at: http://www.nutraceuticalsworld.com/issues/2011-07/view_features/the-nutraceutical-beverage-market-thirsting-for-ne/ Accessed July 19, 2011.
2. Product Websites.
3. Oboskiy O, Pischel I, Siriwatanametanon N, Heinrich M. Garcinia mangostana L.: a phytochemical and pharmacological review. *Phytother Res* 2009;23(8):1047-65.
4. Pedrazza-Chaverri J, Cardenas-Rodriguez N, Orozco-Ibarra M, Perez-Rojas JM. Medicinal properties of mangosteen (Garcinia mangostana). *Food Chem Toxicol* 2008;46(10):3227-39.
5. Marcason W. What are the facts and myths about mangosteen? *J Am Diet Assoc* 2006;106(6):986.
6. Spector R. Science and pseudoscience in adult nutrition research and practice. *Skeptical Inquirer* 2009;33(3): 35-41.
7. Lobb A. Science of weight loss supplements: Compromised by conflict of interest? *World J Gastroenterol* 2010;16(38):4880-2.
8. Food and Drug Administration. Guidance for Industry: Factors that Distinguish Liquid Dietary Supplements from Beverages, Considerations Regarding Novel Ingredients, and Labeling for Beverages and Other Conventional Foods. December 2009. Available at: http://www.fda.gov/food/GuidanceComplianceRegulatoryInformation/ GuidanceDocuments/ucm192702.htm. Accessed June 28, 2011.
9. FDA. 21 CFR Part 101 Chapter I, and Part, 190 Food Labeling Regulation, Amendments; Food Regulation Uniform Compliance Date; and New Dietary Ingredient Premarket Notification; Final Rules. 23 September, 1997. Available at: http://www.fda.gov/downloads/Food/Dietary-Supplements/GuidanceComplianceRegulatoryInformation/ucm107951.pdf. Accessed June 29, 2011.
10. Food and Drug Administration. Guidance to industry: Frequently asked questions about GRAS. December 2004. http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodIngredientsandPackaging/ucm061846.htm. Accessed June 29, 2011.
11. Udani JK, Signh BB, Barrett ML, Singh VJ. Evaluation of Mangosteen juice blend on biomarkers of inflammation in obese subjects: a pilot, dose finding study. *Nutr J* 2009;8:48.
12. Wong LP, Klemmer PJ. Severe lactic acidosis associated with juice of the mangosteen fruit Garcinia mangostana. *Am J Kidney Dis* 2008;51:829-33.
13. Dara L,Hewett J, Lim JK. Hydroxycut hepatotoxicity: a case series and review of liver toxicity from herbal weight loss supplements. *World J Gastroenterol* 2008;14:6999-7004.
14. Email with company representative, June 29, 2011.

A Case of Salmonella Gastroenteritis Following Ingestion of Raw Venison Sashimi

Cristian S. Madar MD; Anthony P. Cardile DO; Scott Cunningham MD; Gil Magpantay MD; and David Finger MD

Abstract

An interesting case of gastroenteritis due to Salmonella *Birkenhead following ingestion of raw venison sashimi is described. A 65-year-old man presented with diarrhea, vomiting, and fever. On exam he was hypotensive, tachycardic, with evidence of severe dehydration following ingestion of raw venison sashimi produced with game meat hunted on the Hawaiian island of Lana'i. He responded rapidly to vigorous volume resuscitation, and stool cultures later were positive for* Salmonella *Birkenhead. Non-typhoidal* Salmonella *is the most frequently identified cause of foodborne illness in the United States. Clinicians in the state of Hawai'i should be alert and aware of the potential for the local deer population to be an unusual source of foodborne illness, especially given the prevalence of consumption of raw foods in the local cuisine.*

Introduction

An interesting case of *Salmonella* gastroenteritis following ingestion of some unusual local cuisine is presented. Our patient consumed "venison sashimi" from deer hunted on the island of Lana'i.

Case Report

A 65-year-old Caucasian man from Honolulu presented to the emergency department for evaluation of diarrhea and palpitations. He and his wife had become ill four days previously, with diarrhea and vomiting. His wife's symptoms resolved within 24 hours but his diarrhea persisted and he continued to experience approximately eight watery and non-bloody bowel movements per day as well as new palpitations. He reported fever to 103.1°F at onset of symptoms four days before, but no fever since. He denied recent travel outside of the state of Hawai'i, but several days ago he had traveled from O'ahu to the island of Lana'i where he participated in his family's annual deer hunt. Afterward, he had consumed deer meat in the form of raw venison sashimi, as he and his wife had done in the past without incident. The patient reports he consumed a larger quantity of raw venison sashimi than his wife on this occasion.

His past medical history was notable for hypothyroidism, vitamin B12 deficiency, and Wolff Parkinson White syndrome diagnosed at age 16 but without any previous episodes of arrhythmia. Medications included oral cyanocobalamin, levothyroxine, and occasional naproxen sodium. He no longer smokes but has a 75 pack-year history of tobacco, and drinks wine on occasion.

On presentation to the ED our patient was hypotensive and tachycardic, with dry mucous membranes and prominent skin tenting. However, he was afebrile with normal mentation and had a normal abdominal exam. Electrocardiogram revealed sinus tachycardia with Wolf Parkinson White morphology and occasional premature ventricular complexes. Laboratory evaluation revealed hyponatremic hypochloremic metabolic acidosis with an anion gap of 20 and acute kidney injury. He responded rapidly to vigorous volume resuscitation, but later developed a stable supraventricular tachycardia which quickly resolved with a combination of vagal maneuvers and amiodarone. His persistent diarrhea was treated with ciprofloxacin and metronidazole, given his dramatic presentation and reported history of raw venison ingestion. Blood cultures revealed no growth but stool cultures later were positive for *Salmonella* Birkenhead. He was ultimately discharged in stable condition with complete resolution of his symptoms.

Discussion

There are over one million cases per year of Non-typhoidal *Salmonella* in the United States, making it the most frequently identified cause of foodborne illness in the country. Although typical gastroenteritis is self-limited, many cases are sufficiently severe to cause hospitalization or even death. Non-typhoidal *Salmonella* is responsible for nearly one third of deaths associated with foodborne illness in this country annually. Although outbreaks can occur, sporadic cases account for the majority of occurrences.[1] The Centers for Disease Control and Prevention has previously acknowledged regional differences in the prevalence of various *Salmonella* serotypes.[2] The particular serotype identified in our case, *Salmonella* Birkenhead, was first identified in a series of patients in England in 1948, and since its discovery has been known to cause typical gastroenteritis with diarrhea, vomitting, and fever.[3]

It is known that deer are among the many species of wild animals that can shed *Salmonella* in their feces.[4] This can lead to human infection in those who process, prepare, or consume venison.[4] In Hawai'i, it has long been known that certain animals and animal products have a higher propensity to carry *Salmonella*, particularly Hawaiian hogs and chickens.[5] However, a search of the literature did not find data to implicate the local deer population as a source for foodborne illness. Many clinicians in Hawai'i are unaware of the large populations of free-ranging deer on the outer Hawaiian islands. This is significant because deer are implicated as vectors of multiple foodborne pathogens, particularly *Escherichia coli* O157, *Campylobacter jejuni*, and *Salmonella spp*, although prevalence varies by region.[4,6,7]

Since the state of Hawai'i is geographically isolated, it is important to identify potential, unrecognized sources of *Salmonella* infections and it is important for clinicians to be aware of potential reservoirs and vehicles for transmission of *Salmonella* to patients in the area. The temporal relationship between ingestion and onset of clinical symptoms implicate raw venison as the most likely source of *Salmonella* gastroenteritis in our patient.

The ethnic and cultural diversity of Hawai'i affords a cuisine with ample opportunities to eat raw or undercooked food, including sushi, ceviche, oysters, and clams. Game meat, including deer on Lana'i, is readily available to hunters. Clinicians in Hawai'i should remain alert and aware of the potential local sources of foodborne illness. The deer population of Hawai'i can potentially harbor foodborne pathogens. All persons should be reminded to thoroughly cook game meat and always adhere to safe food handling practices.

The views expressed in this abstract/manuscript are those of the author(s) and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the US Government.

Disclosure Statement

The authors have no disclosures.

Funding

This work did not receive any specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Authors' Affiliation:
- Department of Internal Medicine, Tripler Army Medical Center, Honolulu, HI (CSM, APC, SC, GM)
- Department of Rheumatology, Tripler Army Medical Center, Honolulu, HI (DF)

Correspondence to:
CPT Anthony P. Cardile DO; Tripler Army Medical Center, 1 Jarrett White Road, Honolulu, HI, 96859; Ph: (808) 429-6234; Email: anthony.cardile@us.army.mil

References

1. Crum-Cianflone NF. Salmonellosis and the gastrointestinal tract: more than just peanut butter. *Curr Gastroenterol Rep*. 2008 Aug;10(4):424-31.
2. CDC. *Salmonella* Surveillance: Annual Summary, 2006. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2008.
3. Taylor J, Douglas SH. *Salmonella* birkenhead: A New Salmonella Type Causing Food-Poisoning in Man. *J Clin Pathol*. 1948 Aug;1(4):237-9.
4. Renter DG, Gnad DP, Sargeant JM, Hygnstrom SE. Prevalence and serovars of *Salmonella* in the feces of free-ranging white-tailed deer (Odocoileus virginianus) in Nebraska. *J Wildl Dis*. 2006 Jul;42(3):699-703.
5. Gould KL, Gooch JM, Ching GQ. Epidemiologic aspects of salmonellosis in Hawaii. *Am J Public Health*. 1972 Sep;62(9):1216-21.
6. Lillehaug A, Bergsjø B, Schau J, Bruheim T, Vikøren T, Handeland K. *Campylobacter spp., Salmonella spp., verocytotoxic Escherichia coli*, and antibiotic resistance in indicator organisms in wild cervids. *Acta Vet Scand*. 2005;46(1-2):23-32.
7. Robinson RM, Hidalgo RJ, Daniel WS, Rideout DW, Marburger RG. Salmonellosis in white-tailed deer fawns. *J Wildl Dis*. 1970 Oct;6(4):389-96.

PUBLIC HEALTH HOTLINE
JAY MADDOCK PHD AND DONALD HAYES MD, MPH, ASSOCIATE EDITORS
TONYA LOWERY ST. JOHN MPH AND RANJANI RAJAN MPH, MANUSCRIPT EDITORS

Using Policy to Influence Health Behaviors

Jay Maddock PhD; Professor and Director, Office of Public Health Studies, John A. Burns School of Medicine, University of Hawai'i at Manoa

Human health behaviors are major contributors to premature death and disability in the United States and throughout the world. In the United States, more than 75% of premature deaths are caused by tobacco use, physical inactivity, poor nutrition and heavy alcohol use.[1] Over the past 50 years, public health professionals have used health education as a tool to try to change these behaviors. Health education includes informing people about the risks of the behavior and working with them to develop positive attitudes towards changing their behavior, problem solving for their behavior, and developing new skills to change their behavior. Despite the widespread efforts of health education, the effect on the population's health behaviors has been modest. Consequently, over the past 20 years, there has been a shift in emphasis to try to discover what really works to change behavior.

The social ecological model postulates that human behavior occurs within a broader sphere of influence which includes not only the individual's psychology but also their social setting.[2] This model also examines the effect of institutions such as work and school; community design; and, at the broadest level, public policy. There has been a renewed interest in the effects of public policy on health behaviors. While public health policy has existed in the United States for quite a long time, most of the emphasis was on infectious disease (eg, quarantine policy), food safety (eg, restaurant inspections), and consumer safety (eg, requiring seatbelts in cars). More recently, policy has been used as a powerful influencer on health behaviors. This article will examine the different types of policies that have been used to reduce the adverse health effects of tobacco use, heavy alcohol consumption, physical inactivity, and poor nutrition in the United States.

The prevalence of tobacco use in the United States has declined from 42% of adults in 1965 to just over 20% today.[3] While some of this reduction can be attributed to health education and increasing awareness of the effects of smoking on health, much of it is due to changes in public policy. The main policy areas that have been addressed include taxes on tobacco, clean indoor air laws, and reducing minor's access to tobacco products. The price of cigarettes has been shown to be strongly related to consumption. For instance, a 10% increase in price is estimated to have a 4% drop in smoking prevalence.[4] In 2009, the US Federal Government increased the tax on a pack of cigarettes from $0.39 to $1.01. States vary widely in the amount they tax cigarettes from New York ($4.35 per pack) to Missouri ($0.17 per pack). Clean indoor air laws ban smoking in businesses including restaurants, bars, and other public places. States and localities that have implemented clean indoor air laws have seen drops in hospitalization from heart attacks between 8% and 17%.[5] Currently half of the states have clean indoor air laws. In 1992, the federal Government enacted the Synar amendment which requires States to enact and enforce laws prohibiting selling or distributing tobacco products to individuals under the age of 18. States are required to keep their illegal sales rates to minors (under 18 years old) to less than 20%. This law has been very successful. For example in Hawai'i, the illegal sales rates to minors dropped from 44% in 1996 to less than 5% today.[6]

Alcohol control policy has also been highly effective. Here the main policy strategy has been a harm reduction approach especially in reducing drunken driving accidents. Overall the strategy has been very successful reducing the number of alcohol related traffic fatalities from 26,173 in 1982 to 13,846 in 2008.[7] Alcohol related fatalities now account for only 37% of the total traffic fatalities compared to 60% in 1982.[7] Several policy initiatives contributed to this reduction. These include: reducing the blood alcohol level (BAL) for drunken driving arrests, enforcement of underage drinking laws, and server liability laws. As of 2002, all states had reduced their BAL cutoff for drunk driving from 0.10 to 0.08. A BAL of 0.08 percent means that a person has eight parts alcohol per 10,000 parts blood in the body.[7] It is illegal to serve anyone under the age of 21 alcohol in the United States. Over the last 15 years most states have implemented undercover police operations to determine if establishments are selling alcohol to minors. In Hawai'i, if an establishment sells alcohol to minors, they are issued a fine of at least $1,000. If they are caught three times, they risk losing their license to sell alcohol. Server liability known as Dram Shop laws exist in 35 states for service to adults and 42 states for service to minors. These laws make the server liable if they serve an already intoxicated person or a minor who subsequently causes death or injuries to third-parties.

While the United States has had great success in reducing the health effects of regulated substances such as tobacco and alcohol, policy around health promoting behaviors has proven to be more difficult. Since 1995, obesity has increased from 15.9% of the adult population to 27.6%.[8] This rapid rise in obesity has led many public health officials and lawmakers to consider what policies might help reverse this trend. The main behaviors underlying obesity—physical inactivity and poor nutrition--have been targeted for change. Regulating food sale and consumption

is difficult and the government has often relied on voluntary change by the food industry. However, two policies, mandatory menu labeling and taxing sugar sweetened beverages have been gaining political support throughout the country. Mandatory menu labeling requires restaurants to include calorie information on all the dishes served. To date, two states, California and Vermont have implemented these laws and another four states have passed laws but not yet implemented them.[9] The idea behind menu labeling is simple: informed customers are better able to make good decisions on what to order. A recent study shows that almost 2/3 of customers are aware of calorie information at fast food restaurants with labeling.[10] There is also evidence that menu labeling leads to a small reduction in the amount of calories ordered.[11] National legislation requiring menu labeling for chain restaurants and vending machines has passed and will be enacted in 2012.

Sugar sweetened beverage taxes are also being proposed around the country. These bills would raise the tax on any beverages with added caloric sweeteners. Sugar sweetened beverages are a leading source of added sugar in the American diet and have been linked to obesity, diabetes, and heart disease.[12] Research estimates that a 10% increase in price could lead to an 8%-10% decrease in consumption.[13] As of May 2011, 15 states including Hawai'i have introduced legislation to increase taxes on sugar sweetened beverages. However, none have been adopted yet.

For physical activity, the potential policies are not as clear. Since the 1950s, there has been a steady engineering of physical activity out of everyday life. The movement of people to the suburbs along with modern conveniences has reduced the amount of non-exercise caloric expenditure throughout the day. Non-leisure time physical activity, such as cycling and walking for transport, has declined steadily. Zoning policies which favor single-use areas have proliferated increasing the distance between residential and retail areas. There have been several initiatives at the local level to improve zoning codes and increase non-motorized transportation infrastructures. Nationwide, two policies have been gaining support to improve the safety of pedestrians and cyclists for active transportation: Safe Routes to School (SRTS) and Complete Streets. SRTS is a comprehensive approach to increase walking and biking to school through engineering, education, enforcement, encouragement, and evaluation.[14] Complete Streets focuses on safely accommodating all modes of transportation, prioritizing pedestrians and cyclists, through a variety of policies and practices.[15] By 2010, there were 48 municipalities including Hawai'i with Complete Streets ordinances and another 99 with resolutions.[16]

Despite the enthusiasm for enacting these policies to address the growing obesity problem, the effects are expected to be modest. Policies such as Complete Streets could take over a decade before their effects are seen and menu labeling appears to make less than 100 calorie differences in the items ordered. However, once a comprehensive set of policies are developed, research tested and enacted, there should be a substantial influence on obesity rates in the United States.

In conclusion, policy has played an important role in the United States in addressing health behaviors especially in the area of tobacco and alcohol use. Future policy development around physical activity and nutrition should help in addressing rising obesity rates.

References

1. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the US, 2000. *JAMA.* 2004;291:1238-45.
2. Sallis, JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer B, Vishwanath K, eds. Health Education and Health Behavior. 4th ed. San Francisco: John Wiley and Sons; 2008.
3. Centers for Disease Control and Prevention. Trends in Current Cigarette Smoking among High School Students and Adults, United States, 1965-2009. Available at http://www.cdc.gov/tobacco/data_statistics/tables/ trends/cig_smoking/index.htm. Accessed on August 4, 2011.
4. Task Force on Community Preventive Services. Tobacco. In: Zaza S, Briss PA, Harris KW, editors. The Guide to Community Preventive Services: What Works to Promote Health? New York: Oxford University Press, 2005:3–79.
5. Khuder SA, Milz S, Jordan T, Price J, Silvestri K, Butler P. The impact of a smoking ban on hospital admissions for coronary heart disease. *Prev Med.* 2007;45:3–8.
6. Hawai'i Department of Health. Hawai'i Tobacco Sales to Minors Decline. Honolulu, HI: State of Hawai'I; 2010.
7. Alcohol Alert. 2008 Drunk Driving Statistics. Available at: http://www.alcoholalert.com/drunk-driving-statistics.html. Accessed on June 16, 2011.
8. Centers for Disease Control and Prevention. Weight Classification by Body Mass Index, Nationwide, 1995-2010. Available at: http://apps.nccd.cdc.gov/brfss/display.asp. Accessed on August 4, 2011.
9. Center for Science in the Public Interest. State and Local Menu Labeling Policies. Available at: http://cspinet.org/new/pdf/ml_map.pdf. Accessed on August 4, 2011.
10. Dumanovsky T, Huang CY, Bassett, MT, Silver LD. Consumer awareness of fast food calorie information in new York City after implementation of a menu labeling regulation. *AJPH.* 2010;100:2520-2525.
11. Pulos E, Leng K. Evaluation of a voluntary menu labeling program in full service restaurants. *AJPH.* 2010;100:1035-9.
12. Johnson RK, Appel LJ, Brands M, Howard BV, Lefevre M, Lustig RH, Sacks F, Steffan LM, Wylie-Rosett J. Dietary Sugars Intake and Cardiovascular Health. A Scientific Statement from the American Heart Association. *Circulation.* 2009;120:1011-1020.
13. Andreyeva T, Long WM, Brownell KD. The impact of food prices on consumption: a systematic review of research of the price elasticity of demand for food. *AJPH.* 2010;100:216-22.
14. National Safe Routes to School Task Force. Safe Routes to School: A Transportation Legacy. 2008. Available at: http://www.saferoutesinfo.org/task_force/collateral/task_force_report.web.pdf. Accessed on August 2, 2010.
15. Brock E. Complete Streets aim to please all users. *Am City County.* 2008;123(13):17–18.
16. National Complete Streets Coalition. Complete Streets – Current Policies. Available at: www.completestreets.org/complete-streets-fundamentals/complete-streets-atlas/. Accessed on February 7, 2011.

Importance of Research in Medical Education

Abby C. Collier PhD; Assistant Professor of Pharmacology, Department of Tropical Medicine, Medical Microbiology and Pharmacology, University of Hawai'i John A. Burns School of Medicine

Introduction

In the last several decades, medical student education has changed dramatically from the idealized and antiquated images commonly presented in literature and the popular media (Figure 1). Progressively, medical school curricula have seen the introduction of problem-based learning,[1] community outreach,[2,3] cultural awareness,[4,5] ethics in medicine,[6,7] and other humanist elements. These have replaced the traditional curriculum and primarily at the expence of didactic lectures.

A more recent inclusion, (notable in trending back towards scientific medicine), has been broad-scale introduction in most US medical schools of a research experience for medical students.[2,8] The nature and size of these research experiences vary widely from school to school, but the common theme is a block of time wherein medical students are released from some (rarely all) medical subjects to perform research under an established scientific or clinical mentor.[8]

In choosing to remove valuable time from academic medicine, medical education specialists (including professors responsible for curriculum development as well as medical school administrators and Deans) must ensure that the benefits of a research experience outweigh the consequences of compressing an already tight learning schedule. If the programs providing research experiences are managed optimally, involving input from administration, scientific/clinical mentors, and the students; a research experience can benefit the student greatly, strengthen faculty/student and clinician/scientist relationships, and enhance the reputations of those involved, including institutional reputations.

At the John A. Burns School of Medicine (JABSOM), research for medical students has evolved since 2006 to include; a dedicated block of curricular time for a research rotation, centralized coordination through the Office of Medical Education (OME), courses offered for credit that appear on student transcripts, and an annual biomedical sciences symposium (coordinated by the Department of Cellular and Molecular Biology) for research dissemination. The following is a description of the impact of this evolution on medical student education, including the author's experiences and recommendations for mentors offering clinical, translational, and basic science research projects for medical students. The discussions include concluding remarks on how research experiences assist medical students in their future careers.

Finding Space in the Curriculum and Fitting in Time for Research

Formalized research experiences come at the expense of traditional didactic lectures, which places pressure on the curriculum (and on the individual student), and often results in minimizing time spent on research. For a meaningful experience, a basic requirement is an unbroken block of at least 4-6 hours per day, for one or two days per week over a six-week period. At JABSOM this has been achieved by offering research rotations during the summer months in one or both of two, six-week blocks. Moreover, at mentors, and students, joint request, the OME may approve a for-credit experience in fall or spring units.

These research experiences usually begin with 8-12 hours of training to bring students to proficiency with basic laboratory equipment such as tissue handling devices, pipettors, pH meters, plate readers, and microscopes. More technically demanding techniques or equipment (notably analytical methodology) can require two or three training sessions. It is important that students are provided appropriate time at the beginning of their internship for training and learning. A poorly trained student will be unhappy, will not produce good scientific results, and may even break or disable essential laboratory equipment. Negative outcomes caused by insufficient or inadequate training are the responsibility of the mentors.

Once training is completed, sufficient time must be set aside for actual research efforts. A common example for medical student projects are those based on clinical chart review and statistical analyses of results. It is unusual for a person undertaking their first chart review to appreciate the amount of time and effort required to comb through even a single clinical record. The mentor must be cognizant of the time required, the availability of the student, and plan as well as advise the student accordingly. It is important that students honestly commit their time and effort if they wish to see excellent outcomes. The following is the first of several examples where communication is of utmost importance. The expectations of the researcher, including their knowledgeable assessment of time requirements, must be communicated to the medical student. Similarly, the medical student needs to be honest and forthright on their availability and commitment.

A way in which medical student research projects can be accelerated is by having technicians, graduate students, post doctoral fellows or residents collect clinical samples, prepare

tissues, and ribonucleic acid, and make buffers so that the medical student intern is performing the "important" scientific experiments. This is useful for maximizing the research experience, but short-changes the medical student on a true understanding of the time and effort required to prepare top quality clinical, translational, or scientific work. Clinical Fellows performing research have remarked to the author that they had "no idea" of the staggering level of work and time that go into collecting tissue, preparing samples, preparing buffers, and so on, let alone optimizing and performing the actual experiments prior to analyzing data. Likewise, there is a logical temptation for many mentors to have staff or statistical collaborators perform data analysis so that the student "just has to graph" the results. Again, this is valuable in giving the medical student a taste of research by training them to perform key experiments and also accelerates data acquisition for the mentor, but it also excuses the student from the rigors of data analysis. Either or both of these approaches are logical, defensible, and useful, although they ultimately confer a less rich and less complete experience for the medical students.

While it may not be feasible for the medical student to collect all of their own tissues or analyze all of their own data, valuable experiences can be had from participating it at least one collection or performing the analysis of a subset of the results. In this manner each student has an appreciation of the time, commitment, and care needed in both the set-up (front end) and concluding (back end) stages of research; yet, attains an accelerated experience. If the goal of medical student research experiences is to understand how medicine, science, and society come together, then a full appreciation of research preparation, set-up, performance, analysis, and communication are important.

Centralized Co-ordination and Identifying Appropriate Mentors

With the formalization of research experiences at JABSOM, it has been useful and successful to centrally coordinate research activities in the Office of Medical Education. The office coordinates medical student research experiences/rotations annually to allow medical educators to identify mentors that students would not otherwise approach.

Matching Students with Researchers

Annually, a list of researchers, their specialties/interests and capacity for offering internships is collected, collated, and presented to students to select from, on a first-come-first serve basis. More than just medical education, this practice has also strengthened student-faculty relationships. For example, JABSOM, like most US medical schools, has a separate building for research and medical education. In the "research" building, the majority of professors have no teaching commitments or interaction with medical students. Additionally, and also similar to many US medical schools, the hospitals where clinical learning occurs are remote from our teaching campus. Many physicians in Hawai'i perform excellent research and, while a significant proportion of these physicians have appointments at the Medical School, many do not interact with medical students until the 3rd or 4th year. The centralized process described for mentor identification whereby a list of research mentors and their available projects is provided, enables students to identify the best researcher whose interests most closely align with their own, despite a lack of familiarity between individuals.

Optimizing Project Design for Medical Student Learning and Scientific Outcome

Having identified clinicians and scientists willing to mentor medical student research, consideration must be given by individual mentors to the most appropriate and high yield projects for these students. Medical students present an extremely attractive pool of talent for research since they are intelligent, motivated, and can rapidly acquire concepts and techniques. However, they do not have the time commitment nor future career outlook of a graduate basic science student. Hence research projects for medical students need to be designed accordingly. Primarily, a project with clear clinical or translational relevance should be presented. Unlike basic science students who may be academically stimulated by the question-and-answer paradigms or problem-solving aspects of research, most medical students seek a clinically relevant focus with immediate or potential outcomes.

Insofar as outcomes and research should be human focused, it is recommended and desirable to have human subject research approvals or animal use protocols in place before the student begins. Medical students should not be expected to write time-consuming protocols for approvals. In addition, retroactive approval for work performed is seldom, if ever, ethically acceptable.

Incoming students should be given a short summary of their project encompassing a summary of the background including hypothesis, brief overview of methodology to be used, predicted results, and projected project outcomes. Project outcomes span a spectrum of deliverables from knowledge acquisition, through oral or poster presentations to a possible publishable paper. If a mentor has insufficient time to prepare this document (generally two pages) in the months preceding a student's arrival, and which can commonly be gleaned from existing resources, mentors should strongly consider whether they have appropriate time for students.

Project design is also important. Where possible, projects should have a solid, single ended non-conditional hypothesis that will result in a "yes" or "no" answer. This requires that the project have an inevitable conclusion. Open-ended projects that are generally non-hypothesis driven, based on conditional hypotheses or on "what if" type of questions, will not have a concrete conclusion. The consequences of this are a feeling of incompleteness when the student concludes their research rotation. In such instances, individual students may feel obliged or be coerced to keep working for their mentors with no end in sight, potentially to the detriment of the student's medical education.

Another important issue in research is ownership. While it is indisputable that the mentor is the primary designer, compiler, curator, financier, and owner of data produced, students should be given credit for their work. Insofar as research can be analogized as a team effort, the medical student is a valuable member of the mentor's research team and while all the team members contribute, each individual needs to be recognized.

Ideally, all students can and will contribute to research that is meaningful, to be communicated as a case report, clinical observation, or research paper. However, more appropriate outcomes of the "smaller and safer" projects described herein, may commonly be posters or Power Point (oral) presentations at local, national, or international meetings. For this purpose the growth of the annual two-day Biomedical Sciences Symposium held at JABSOM has been invaluable. This symposium is poster-based, contains categories for undergraduates, graduate students, medical students, and fellows/faculty. Prizes are awarded for best poster presentation in each category. This is an important venue for building verbal communication and presentation skills in medical students (and others). It is also valuable for building faculty-student relationships and faculty-faculty relationships. The entire school comes together to discuss medicine and research.

Benefits to Future Medical Careers

Participating in a research experience has more far-reaching consequences than the immediate outcome of paper publication or research presentations. Having formal university credits for research on a transcript and for some, a letter of support from the research mentor, enhances the competitiveness of medical students for residencies. This activity, contributes to students' happiness and satisfaction in achieving their goal in medicine. It also enhances the prestige of the medical school and community when its students successfully gain competitive Residencies.

Additional intangible effects may occur in students' future careers. All students are required to keep detailed and accurate laboratory notebooks documenting their work. For many, this is the first time they have been required to provide a clear and accurate account of a discrete experience. It is common to remind medical students to record their work completely, accurately, and in great detail. Clearly, the acquisition of these skills early in a medical career has obvious advantages for improved charting and clinical note taking.

Another benefit is improved understanding, diagnostic techniques that may be gained from a research experience. Physicians regularly order laboratory-based tests and while an encyclopedic understanding of these is unnecessary, a deeper appreciation of the methods used and problems experienced may ensure judicious use of diagnostics, sample collection, and outcomes.

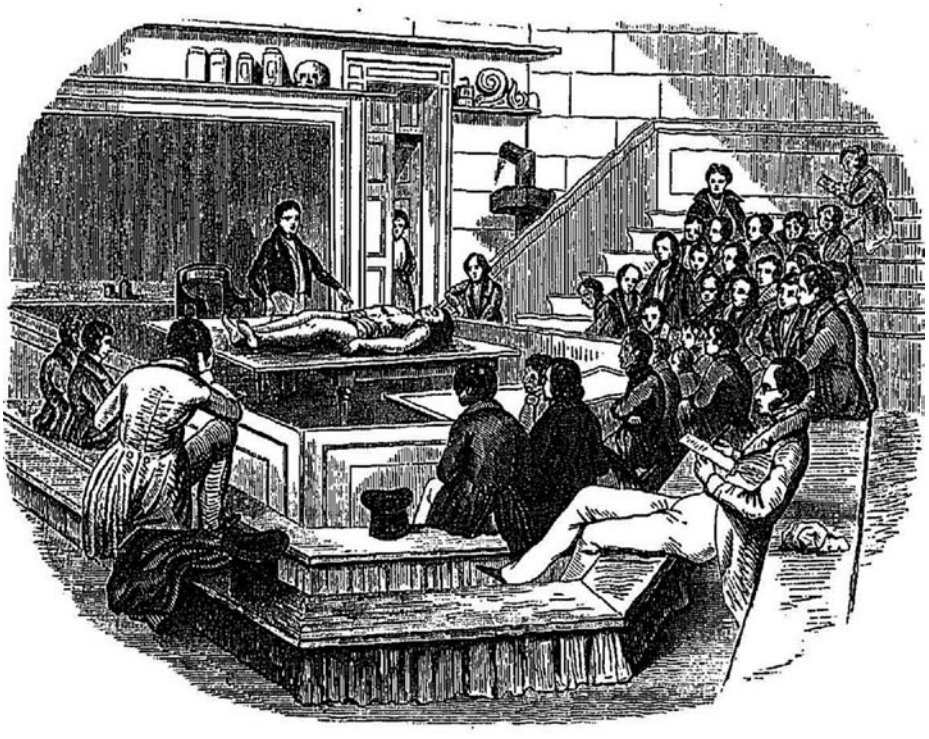


Figure 1. Anatomy Lecture Room. Drawing by Henry Hollingsworth Smith (1854).[9]

Finally, a research experience during medical school years is invaluable for those physicians who choose to become researchers, who partner with a scientific researcher for investigations, or who encounter researchers in their practice. The understanding of appropriate experimental design, procedures, and analysis, including the time commitments conferred by their research experience can enhance their future efforts immeasurably and increase the success of others with whom they collaborate or interact.

Concluding Remarks

The JABSOM approach to providing a research experience for medical students has evolved into a well coordinated and beneficial exercise, with significant positive impacts for students, faculty, and the school. Mentors need to keep in mind the commitment they make to each medical student intern, including appropriate project design, training and availability of human and experimental resources, and laboratory space when agreeing to offer a research experience. The benefits of a research experience reported by many current and former students argue strongly for the validity and contribution of research to medical students' education and to their future as physicians.

References

1. Townsend G. Problem-based learning interventions in a traditional curriculum are an effective learning tool. *Evidence Based Dentistry* 2011;12:115-6.
2. Dehaven M, Gimpel, NE., Dallo, FJ., Billmeier, TM. Reaching the underserved through community-based participatory research and service learning: description and evaluation of a unique medical student training program. *Journal of Public Health Management and Practice* 2011;17:363-8.
3. Dhar S, Alford, RL., Nelson, EA., Potocki, L. Enhancing exposure to genetics and genomics through an innovative medical school curriculum. *Genetic Medicine* 2011;ePub ahead of print Sept 26, 2011.
4. Kumagai A, Lypson, ML. Beyond cultural competence: critical consciousness, social justice, and multicultural education. *Academic Medicine* 2009;84:782-7.
5. Rios E, Simpson, MC. Jr. Curriculum enhancement in medical education: teaching cultural competence and women's health for a changing society. *Journal of the American Medical Women's Association* 1998;53:114-20.
6. Chen R. Student participation in health professions education research: in pursuit of the Aristotelian mean. *Advances in Health Science Education Theory and Practice* 2011;16:277-86.
7. Wearn A, Wilson, H., Hawken, SJ., Child, S., Mitchell, CJ. In search of professionalism: implications for medical education. *NZ Medical Journal* 2010;123:123-32.
8. Buddeberg-Fischer B, Herta, KD. Formal mentoring programmes for medical students and doctors--a review of the Medline literature. *Medical Teaching* 2006;28:24257.
9. Smith HH. Anatomy Lecture Room. In. Anatomical Atlas, Philadelphia; 1854. According to the University of Pittsburgh Library, this image is in the public domain.

Modern Medicine and the Road to Prevention: A Long and Tortuous Path

Robert V. Cooney PhD; Department of Public Health Sciences, John A. Burns School of Medicine, University of Hawai'i at Manoa

Traditionally medical education and the practice of medicine have focused on the treatment and cure of disease with considerably less attention devoted to the prevention of the chronic diseases of aging. With ongoing discoveries in basic mechanisms of biochemistry, physiology, nutrition, and molecular biology there is a growing sense that the onset of many of the inevitable diseases of aging may be significantly delayed and reduced in intensity. This has prompted the development of clinical prevention studies to test the efficacy of various prevention approaches to a variety of important diseases such as cardiovascular disease and cancer. Regrettably recent highly publicized failures of many of these trials has jeopardized future trials and thrown the concept of prevention into serious disarray. In particular the failure of the *Selenium and Vitamin E Cancer Prevention Trial*, (SELECT),[1] to demonstrate a reduction of prostate cancer incidence (indeed a significant increase in prostate cancer was observed for the vitamin E arm) after spending over $100,000,000 has significantly impugned the role of vitamin E and selenium in human disease prevention and will severely impede future trials of these agents and others. A closer look at these trials, their underlying philosophical and biochemical bases, and their implications reveals many inadequacies in the current practice of preventive medicine research, and suggests why they may have failed, as well as providing a blueprint for the design of future trials.

Clinical Treatment vs Prevention

In traditional cancer treatment, patients are often treated with chemotherapeutic drugs or radiation where the therapeutic dose regimen is based on the concept of "Maximum Tolerated Dose" (MTD). MTD essentially defines the highest dose that can be given to a patient without unacceptable acute side effects. In the case of a fatal disease, many serious side effects can be tolerated in the expectation that the underlying fatal disease will be cured. The concept of MTD is also based on the assumption that more is better in terms of the ultimate goal of eradicating the tumor. When the goal is to kill a particular type of cell (tumor or bacteria), this concept is generally valid, as one does not routinely observe U-shaped killing responses for toxic agents in which the effect is reversed at higher doses. In contrast, prevention of disease is based upon an entirely different concept, namely optimization of physiologic function to reduce the rate of accumulated damage associated with the aging process. In the world of biology a U-shaped or bi-phasic response to agents is the norm and particularly with respect to nutrition an optimal level is often found whereby both deficient and excessive levels can cause disease, sometimes the same disease. In nutrition, balance and optimization of levels is the goal, not MTD. We can "tolerate" very high levels of many nutritional agents such as vitamin E and ß-carotene without manifestation of acute effects,[2,3] however, as has been demonstrated in large, expensive, long-term prevention trials of these agents, such doses do not improve long-term health and may be deleterious.[1,4,5]

Whereas most treatment trials are relatively short in duration and enroll smaller numbers of patients, due to the relatively short time to endpoint and the clarity of the endpoint (reduction in tumor size or death), prevention trials are inherently expensive due to the large number of subjects required and the long follow-up time required to accumulate sufficient events. Also prevention in a normal population has virtually no tolerance for side effects, either acute or long-term, whereas trials of severely sick or terminal patients can tolerate much higher levels of adverse events. Because prevention trials have such large numbers of participants over long periods of time we are much more likely to detect subtle side effects and adverse events that would never be picked up in traditional treatment trials. The impact of all of these differences in approach combined to drive the results obtained in the SELECT trial and in combination with the underlying biochemistry may explain the results observed.

SELECT: A Therapy Trial Posing as a Prevention Trial

The Alpha-Tocopherol, Beta-Carotene Trial (ATBC) carried out in the 1980s[4] demonstrated a highly significant reduction in prostate cancer incidence (32%) and mortality (41%) for those subjects receiving 50 mg/day of racemic α-tocopherol acetate (vitamin E). This trial involving 29,133 Finnish smokers over seven years also observed increased incidence and mortality for lung cancer in those subjects consuming 20 mg per day of ß-carotene.[4] While the dose of vitamin E consumed was modest (two to three times the recommended daily allowance), the beta-carotene dosage greatly exceeded the levels of ß-carotene that could normally be obtained in the diet and significant increases in lung cancer incidence and mortality were observed, as well as suggestive increases in incidence and mortality for prostate cancer in those men receiving ß-carotene. Because prostate cancer was not the primary endpoint for the ATBC

Trial, the importance of the promising results for vitamin E supplementation in prostate cancer were not viewed as definitive. The subsequent SELECT trial, in contrast, was designed with prostate cancer as the primary endpoint. Rather than building upon the ATBC results based on a dose of 50 mg/day, however, a single dose of synthetic all racemic α-tocopherol acetate of 400 mg/day was chosen, eight fold higher than the successful ATBC trial and nearly 20 times higher than the RDA.[6] In addition synthetic α-tocopherol was used which contains eight different stereoisomers as opposed to the only form found naturally, d-α-tocopherol, the form with the highest vitamin E activity.[6] The SELECT trial population was made up of men who, on average, had plasma levels of α-tocopherol of 12.5 μg/ml,[1] well above the level considered deficient for vitamin E activity (5.16 μg/ml) by the Institute of Medicine[6] (IOM) and near the bottom of the U-shaped mortality curve observed for men in the ATBC trial,[7] where levels of 13-14 ug/ml were considered optimal with respect to overall mortality, and men with lower and higher levels of alpha-tocopherol were at elevated risk of death.[7] This means that the SELECT trial was carried out on a population of men that were not deficient in vitamin E and likely on average had optimal levels of vitamin E and were given a sub-optimal preparation of α-tocopherol at a dose greatly in excess of levels demonstrated to meet vitamin E requirements and to reduce prostate cancer incidence and mortality. While such an approach might have been justified for a clinical treatment trial, as a prevention strategy this design was nonsensical. After five years the trial was halted early as there was no possibility of demonstrating a beneficial effect of the treatment and there was a borderline significant increase in prostate cancer incidence! Continued monitoring of subjects after cessation of the trial has now revealed a significant 17% increase in prostate cancer incidence in those receiving vitamin E in the SELECT trial.[5] The chilling effect of this trial can be summed up by the following statement in a 2009 JAMA editorial by Peter Gann of the University of Illinois at Chicago accompanying the publication of the SELECT results: "It may be time to give up the idea that the protective influence of diet can be emulated by isolated dietary molecules given alone or in combination to middle-aged and older men."

Analysis of a Failed Trial

Although the failure of the SELECT trial to demonstrate an appreciable benefit of supplemental vitamin E may not be surprising given the deficiencies in its design, the unexpected demonstration of increased prostate cancer incidence for the vitamin E-treated arms represents a fascinating result that demands further analysis and explanation. Even nutritionally required molecules can be toxic at sufficiently high levels and understanding the mechanism of such toxicity can often shed light on basic physiologic processes. Although a dose of 400 mg/day was not previously considered to be at the high end of the spectrum for vitamin E consumption or anywhere near its safety level, supplementation of this amount of α-tocopherol does have a known effect on the level of γ-tocopherol in the bloodstream. γ-Tocopherol is the major tocopherol consumed in the American diet and constitutes about 10-15% of the tocopherol found in circulation. It differs from α-tocopherol by one less methyl group on the phenolic ring. Its bioactivity with respect to vitamin E is much less than α-tocopherol and consequently the IOM has not determined a requirement for γ-tocopherol and currently dismisses its contribution toward classical vitamin E bioactivity.[6] γ-Tocopherol has been found, however, to be a unique antioxidant that protects cells from damage associated with nitrogen-based oxidants and consequently may be important for preventing damage from chronic inflammation associated with the generation of nitric oxide and peroxynitrite in the body, whereas α-tocopherol appears to be far less effective.[8-10] γ-Tocopherol, but not α-tocopherol, also acts as an anti-inflammatory agent[11] and may therefore reduce long-term damage to cells in this manner as well. Consumption of excessive levels of α-tocopherol causes a corresponding decrease in circulating levels of γ-tocopherol.[12] Indeed in the SELECT trial, γ-tocopherol levels in the blood of subjects receiving α-tocopherol were found to be 50% lower than at baseline or in those individuals receiving a placebo,[1] while α-tocopherol levels rose by 50%.

Since the initial discovery that γ-tocopherol was more effective at preventing neoplastic transformation of cells in culture,[8] considerable evidence has accumulated for multiple physiologic effects of γ-tocopherol and for the superiority of mixed tocopherols in preventing many types of cancer, including prostate,[13] in animal models. Limited epidemiologic evidence from a prospective study found a five-fold increase in prostate cancer for those with the lowest γ-tocopherol levels compared with those with the highest levels.[14] Additionally in that study it was observed that α-tocopherol was associated with reduced prostate cancer incidence only when γ-tocopherol levels were high. Another prospective study also found higher levels of α- and γ-tocopherols to be associated with reduced risk,[15] whereas a study by Gill, et al, found no association for tocopherols with prostate cancer risk.[16] At this point, while the essentiality of γ-tocopherol cannot be proven, a strong prima facie case for the importance of this naturally occurring dietary molecule in physiology can certainly be made. The emerging picture of the function of the tocopherols is one of preventing both oxidative and nitrosative damage to key cellular molecules, such as DNA in cells. Each molecule may be important in its own unique chemical and biological manner and function at different optimal levels. Excessive levels of either one are potentially deleterious. Such a model offers the best explanation to date for the failure of the SELECT trial and reminds us that moderation may be the best approach, particularly when we do not understand all the parameters involved.

Whither Prevention Research

Optimal nutrition, whether through diet or supplementation, offers great promise for delaying or preventing many chronic and acute diseases. We have very clear understandings of the acute effects of deficiencies, such as vitamin C and scurvy,

vitamin A and blindness, vitamin D and rickets, etc, however, our knowledge of the long-term consequences of adequate, yet suboptimal levels, of these nutrients remains in its infancy. Fundamental research into the mechanisms of action for essential nutrients and the consequences of inadequate levels in humans requires considerable additional research. As Regina Brigelius-Flohe stated in 2009[17]

> Vitamin E has fascinated researchers by a bewildering scope of proven or potential functions, yet-like an Elisabethan virgin immortalized by William Shakespeare in one of his many comedies, persistently guards the secrets that might explain its odd behavior. In fact, it remains the last of the vitamins that awaits the elucidation of a molecular mechanism of action decoding its physiological importance.

The failure of the SELECT trial should not be viewed as the end for vitamin E, rather it should stimulate additional research to conclusively determine both the optimal levels and types of tocopherols required by humans and the mechanism(s) by which they operate. Likewise we should apply the same logic and approach to other nutrients, eg, vitamin D before embarking on large clinical trials using non-physiologic doses of agents for which we do not fully understand either their regulation *in vivo* or their mechanism of action. It is only through such fundamental research and properly designed intervention trials that we will optimize health and function for people and thereby reduce chronic disease incidence and severity for many.

References

1. Lippman SM, Klein EA, Goodman PJ, et al. Effect of selenium and vitamin E on risk of prostate cancer and other cancers: the Selenium and Vitamin E Cancer Prevention Trial (SELECT). *JAMA.* 2009; 301(1):39–51.
2. Bendich A, Machlin LJ. Safety of oral intake of vitamin E. *Am J Clin Nutr.* 1988; 48:612-9.
3. Bendich A. The safety of beta-carotene. *Nutr Cancer.* 1988; 11:207-14.
4. Heinonen OP, Albanes D, Virtamo J, Taylor PR, et al. Prostate cancer and supplementation with α-Tocopherol and ß-Carotene: Incidence and mortality in a controlled trial. *J Natl Cancer Inst.* 1998; 90:400-6.
5. Klein EA, Thompson IM Jr, Tangen CM, Crowley JJ, et al. Vitamin E and the risk of prostate cancer: the Selenium and Vitamin E Cancer Prevention Trial (SELECT). *JAMA.* 2011; 306:1549-56.
6. Report of the Institute of Medicine: Food and Nutrition Board. Vitamin E. In Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids National Academy Press, Washington, D.C; 2000:186-283.
7. Wright ME, Lawson KA, Weinstein SJ, Pietinen P, et al. Higher baseline serum concentrations of vitamin E are associated with lower total and cause-specific mortality in the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study. *Am J Clin Nutr.* 2006; 84:1200-7.
8. Cooney RV, Franke AA, Harwood, PJ, Hatch-Pigott V, Custer LJ, Mordan LJ. γ-Tocopherol detoxification of nitrogen dioxide: Superiority to α-tocopherol. *Proc Natl Acad Sci USA* 1993; 90:1771-5.
9. Christen S, Woodall AA, Shigenaga MK, Southwell-Keely PT, Duncan MW, Ames BN. Gamma-tocopherol traps mutagenic electrophiles such as NO(X) and complements alpha-tocopherol: physiological implications. *Proc Natl Acad Sci USA* 1997; 94:3217-22.
10. Cooney RV, Harwood PJ, Franke AA, Narala K, et al. Products of gamma-tocopherol reaction with NO2 and their formation in rat insulinoma (RINm5F) cells. *Free Radic Biol Med.* 1995; 19:259-69.
11. Jiang Q, Ames BN. Gamma- tocopherol, but not alpha-tocopherol, decreases proinflammatory eicosanoids and inflammation damage in rats. *FASEB J* 2003:17:816-22.
12. Cooney RV, Franke AA, Wilkens LR, Gill J, Kolonel LN. Elevated plasma gamma-tocopherol and decreased alpha-tocopherol in men are associated with inflammatory markers and decreased plasma 25-OH vitamin D. *Nutr Cancer* 2008; 60 Suppl 1:21-9.
13. Ju J, Picinich SC, Yang Z, Zhao Y, Suh N, Kong AN, Yang CS. Cancer- preventive activities of tocopherols and tocotrienols. *Carcinogenesis.* 2010; 31:533-42.
14. Helzlsouer KJ, Huang HY, Alberg AJ, Hoffman S, Burke A, Norkus EP, Morris JS, Comstock GW. Association between alpha-tocopherol, gamma-tocopherol, selenium, and subsequent prostate cancer. *J Natl Cancer Inst.* 2000; 92:2018-23.
15. Weinstein SJ, Wright ME, Pietinen P, King I, Tan C, Taylor PR, Virtamo J, Albanes D. Serum alpha-tocopherol and gamma-tocopherol in relation to prostate cancer risk in a prospective study. *J Natl Cancer Inst.* 2005; 97:396-9.
16. Gill JK, Franke AA, Steven Morris J, Cooney RV, Wilkens LR, Le Marchand L, Goodman MT, Henderson BE, Kolonel LN. Association of selenium, tocopherols, carotenoids, retinol, and 15-isoprostane F(2t) in serum or urine with prostate cancer risk: the multiethnic cohort. *Cancer Causes Control.* 2009 20:1161-71.
17. Brigelius-Flohe R. Vitamin E: the shrew waiting to be tamed. *Free Radic Biol Med.* 2009; 46:543-54.

THE WEATHERVANE

RUSSELL T. STODD MD; CONTRIBUTING EDITOR

EXCELLENT WINE GENERATES ENTHUSIASM.

For several years it has been known that red wine consumed daily (in modest quantities), is beneficial to cardiac function. Researchers in the United Kingdom reporting in the American Journal of Clinical Nutrition, found that women who consumed wine daily had substantially higher spinal bone density than nondrinkers. Beer or liquor did not impart this benefit, nor did dietary factors such as protein or vegetable consumption. A traditional English diet high in fried foods, beans, red meat, savory pies, and cruciferous vegetables was associated with lower hipbone density. Strong heart, strong bones, and red wine: a winning combo for cherchez la femme.

GET THE FOOD BANK TO SHASTA COUNTY, CALIFORNIA, IMMEDIATELY!

As if there weren't enough weird medical issues in northern California, the latest strange event is the "epidemic" of kwashiorkor. This virulent disease of starvation produces emaciated torso and upper extremities and a grossly distended belly. It is seen most often in Africa and is frequently fatal. Prime Health Services moved into the area in 2008 when it took over Shasta Regional Medical Center. That year eight cases of this debilitating disease of starvation were reported. In 2009, the first full year under Prime, kwashiorkor was listed as a Medicare diagnosis an astonishing 1,030 times. That figure is at least 70 times the statewide rate for a general hospital. In a cited case, reimbursement from Medicare increased by more than $6,700 ($4,708 to $11,463) by noting kwashiorkor on the bill. The above patient is an overweight type 2 diabetic who had spent five days at Shasta Regional Medical Center after she was hurt in a fall. She was not treated for malnutrition, had never heard the word kwashiorkor and was dumbfounded when informed by a reporter. A hospital spokesman defended the billing by claiming the patient had low albumin, a not surprising lab finding since she is on dialysis. Where are the Inspector General, the Joint Commission, and the fraud police when this kind of theft is ripping Medicare?

PART ONE: FAT AMERICA ATTACKS THE FERRY BOATS.

There will be new problems on the Puget Sound ferry system. These floating barges carry 22 million passengers a year in 23 vessels across the Sound, through the San Juan Islands and up to British Columbia. As of December 1, 2011, the Coast Guard stability rules took effect raising the average weight of an adult passenger to 185 pounds. Previously 160 pounds was considered to be average adult weight. A study released by the Centers for Disease Control and Prevention (CDC) documented a 25 pound average increase in weight and one inch increase in height in the in the last two decades. This has effectively reduced the number of passengers by about 250 depending on the particular ferry. The reduced capacity won't have much effect on the spacious ferries, but may have a serious impact on the small charter fishing boats. Family doctors and internists must make special emphasis on weight reduction and body mass index for their obese patients.

PART TWO: FAT AMERICA STRIKES THE OPERATING ROOM.

A 330 lb manufacturing worker suffered a stroke and was treated at a hospital. He underwent several surgeries, including one to remove part of his skull. About a month after admission he was scheduled for insertion of a lumbar drain. While sedated he was rolled off the operating table and fell to the floor, allegedly striking the side of his head where part of his skull was removed. There was "significant bleeding" and the patient was taken for an immediate CT scan. Prior to the fall he had been improving, but subsequently his condition deteriorated, and went into a coma. He died less than a month after crashing in the OR. The patient's family claimed the hospital lacked appropriate facilities and equipment, including wide-enough tables and adequate support, to perform surgery on this patient. The hospital never explained the cause of the fall, and the judge ruled the hospital was negligent. The jury found that the fall, not the stroke, caused the patient's death. The family was awarded $225,000. Should the hospital have a weight limit on their pre-op checklist?

PLAY IT AGAIN, JORGE!

Thanks go to Jorge Camara MD, the very talented musician, skilled eye surgeon, and long-standing member of the Hawaii Ophthalmological Society. Jorge prepared a lucid description of the unusual conjunctivitis that we see in Hawai'i generated by the volcanic ash so frequently seen when the trade winds subside. If you missed it, check the online edition of the Hawai'i Medical Journal December 2011. A summary was run in the Honolulu Star Advertiser as well.

YOU AREN'T FULLY DRESSED UNTIL YOU WEAR A SMILE.

People who face the public daily want to have a nice smile. Red wine, tobacco and coffee may leave darkened canines and incisors, so now various techniques are available to whiten teeth. The Food and Drug Administration (FDA) classified teeth-whitening products as cosmetics, so drug stores are selling strips consumers can paste on at night. But wait! Four out of five dentists believe they should handle teeth whitening. They are battling with spas, tanning salons, and other non-dental peddlers of pearly whites. Non-dentists argue that dentists are just protecting turf. Dentists charge between $300 and $700 for a whitening session while non-dentists charge around $100 to $150, according to the Federal Trade Commission. In Connecticut the teeth gnashing began in earnest when the Connecticut State Dental Commission passed "Declaratory Ruling: Teeth Whitening." Only licensed dentists would be able to offer on-site teeth whitening. "We want to make sure that whatever is applied, is applied safely," says Jeanne Strathearn the board chairman. In New Jersey, Beach Bum Tanning & Airbrush chain offers $69 teeth whitening in a TV commercial. The New Jersey Dental Association sued Beach Bum for practicing dentistry illegally but the court ruled for Beach Bum. The association is appealing.

SUPER BIG ISSUE: CAN THE GOVERNMENT MAKE ME DO IT TO MYSELF?

The Obama administration has asked the Supreme Court to decide the fate of the health-care overhaul that the President signed in March 2010. Opponents of the law claim that the rule requiring most Americans to carry health insurance or pay a penalty is unconstitutional. So far, three federal appeals courts have ruled on the issue, two in support and one ruling against. The Court announced that arguments will be heard March 26, 27, and 28. On the 26th the question will be if the action is premature because no one has paid a fine for not participating. The 27th will be to hear whether Congress overstepped its authority with the law, and the 28th the Court will hear if the rest of the law will take effect if part is deemed unconstitutional. Fasten your seat belts.

ADDENDA

— Ophthalmology factoid – termites are blind.

— Another reason Hawai'i is an attractive destination, 66% of young Caucasian women think people with tans are more attractive.

— Baggage fees gained the airlines $3.4 billion in 2010. Pack light, Baby.

— For Christmas I bought my wife a self-complaining oven.

— I believe there is somebody out there watching us – the federal government.

ALOHA AND KEEP THE FAITH rts

(Editorial comment is strictly that of the writer.)

Hawai'i Journal of Medicine & Public Health (Instructions to Authors)

Manuscripts

Submit manuscripts to *Hawai'i Journal of Medicine & Public Health,* c/o Drake Chinen, 95-1027 Ainamakua Dr. #114, Mililani, HI 96789.

Also, submit a digital Word document and a PDF file to: drakechinen@gmail.com. (both hard copy and Word doc are required)

Suggest two peer reviewers for your article and provide email addresses of your suggested peer reviewers.

On the title page notate if you are submitting an article that is medical, public health, or cross-cutting (both medical and public health). Also, on page 3 of the instructions to authors, check one box to indicate the type of article you are submitting.

Manuscripts are reviewed by the editors, the peer review panel, and other experts in the particular specialties. Please be aware that your article must comply to the AMA style. Submit only articles that have not been submitted elsewhere.

- Please submit one copy on 8-1/2" x 11" paper.
- Use Microsoft Word.
- Use Times font in 10 point size.
- Do not underline and do not use full caps.
- Use double spaces between lines. Do not use 1-1/2 spacing.
- Use a single space between sentences. Do not use two spaces.
- Number pages consecutively beginning with the title page.
- Tables, figures, graphs, and illustrations can be up to 7-1/2 inches in width. They must be prepared in Microsoft Word or Excel. Numerical data should accompany graphs. Do not embed tables, figures, and graphs within the text their placement must be at the end of the manuscript.
- Photos must be submitted as JPEG.

******Keep manuscript to 3,000 words maximum (abstract, references, tables/figures not included).**

Cover

A cover should contain the name of the author with whom HJMPH will correspond. Include an address, phone number, and email address. Also, list authors' names: first name, middle initial and last name of each author with highest academic degrees; and name of department and institution to which the work should be attributed.
******Keep the title short and specific.**

Abstract

The second page of the manuscript should include an abstract that highlights for the reader the essence of the authors' work. It should focus on facts rather than descriptions and should emphasize the importance of the findings and briefly list the approach used for gathering data and the conclusions drawn.
******Keep abstract to 250 words maximum.**

The abstract summarizes the main points of an article: (1) the purpose of the study, (2) the basic procedures followed, (3) the main findings, and (4) the *principal* conclusions. Expressions such as "X is described," "Y is discussed," "Z is also reviewed" should be avoided in favor of a *concise* statement. A few specific guidelines to consider in preparing an abstract follow:

- Do not begin the abstract with repetition of the title.
- Cite no references.
- Avoid abbreviations.
- Use the salt or ester of a drug at first mention.
- If an isotope is mentioned, when first used spell out the name of the element and then, on line, give the isotope number.
- Avoid the use of trademarks or manufacturers' names unless they are essential to the study.
- Include major terms in the abstract, since the abstract can be text searched in many data retrieval systems.
- Include Keywords.

Style

Use JAMA style consult the AMA Manual of Style.

Common AMA style errors:

- Use the objective case, such as "the team determined" or "the study involved," not I or we, and avoid medical jargon.
- Use generic drug names unless citing a brand name relevant to your findings. Do not use abbreviations in the title and limit their use in the text.
- Use human terms, ie, men and women instead of males and females.
- Use a comma before the conjunction (and, or, nor, but) that precedes the last item in a series.
- Do not use periods with eg, ie, etc, vis, or similar abbreviations. Follow these with a comma and enclose the entire expression in commas or parentheses — (eg, eggs, apples, and nuts)
- Use close parentheses in numbered items (1), (2), (3), etc.
- Citing references in your paper

  Identify references with superscript Arabic numerals corresponding to the item in your reference list:

  Research Institute of Infectious Disease and was subsequently confirmed to contain viable Bacillus anthracis (anthrax) spores that were dispersible in air.[1] Scanning electron microscopy of the spores used in the Senate…

If you are using the same citation in more than one location within the paper; you can refer to the same citation number.

…Russia,[5] occupational studies of workers in goat hair processing mills,[1] and modeling analyses by the US Army.

Place citations outside of punctuation marks.

- Creating your bibliography

List the citations in their order of appearance within your paper.

References
1. Ball MJ. The library of the future: An informatics institution. *Br J Lib Sci*. 1995;40:85-88.
2. Freeman GT. Trends and recent experiments in library design. *Comp Methods Prog Biomed*. 1994;44:161-166.

• Statistical Probability	P
Standard Error	SE
Standard Deviation	SD
Relative Risk	RR
Title of books	Italics
Title of Journals	Italics

Text

We recommend that articles be divided into sections with headings:

Introduction—The purpose of the article and rationale for the study. Do not review the subject extensively.

Methods—Describe the patients or experimental animals clearly. Identify the methods, apparatus, and procedures in sufficient detail to allow other physicians to reproduce the results.

Ethical Approval of Studies and Informed Consent. For human or animal experimental investigations, formal review and approval, or review and waiver, by an appropriate institutional review board or ethics committee is required and should be described in the Methods section. For those investigators who do not have formal ethics review committees, the principles outlined in the Declaration of Helsinki should be followed. For investigations of human subjects, state in the Methods section the manner in which informed consent was obtained from the study participants (ie, oral or written).

Results—Present the results in logical sequence in the tables, illustrations, and tables. Do not repeat all of the data in the text; summarize important observations.

Discussion—Emphasize the new and important aspects of the study and conclusions taken from them. Do not repeat data in Results section. State new hypotheses when warranted, but clearly label them as such. Recommendations may be included.

Acknowledgments

Acknowledge only persons who have made substantial contributions to the study. Authors are responsible for obtaining written permission from everyone acknowledged by name; readers might believe those acknowledged are endorsing the study and conclusions.

Disclosure Statement

In order to facilitate the citation and indexing of articles for MEDLINE and for full-text access on PubMed Central, the National Library of Medicine requires that disclosure information be provided by each author. This disclosure information must be specific and address any financial relationship with the sponsoring organization, any interests represented, and/or products discussed or implied. These statements should appear within the paginated text of the article. This is to promote transparency and allow PubMed users to judge the value of findings in published articles.

While you may file ICMJE (International Committee of Medical Journal Editors) Uniform Disclosure Form for Potential Conflicts of Interest (http://www.icmje.org/coi_disclosure.pdf), a simple statement disclosing all relationships that could be viewed as presenting a potential conflict of interest would be sufficient. This includes a financial disclosure statement pertaining to: grants, honoraria, royalties, payments for manuscript preparation or other activities, patents, stock options, travel expenses, gifts, and so on.

A disclosure can be a team statement such as: "None of the authors identify any conflict of interest." Or "Dr. XXX reports serving on the scientific advisory boards of XYZ Company. Dr. YYY reports serving on…Associated honoraria for Drs XXX and YYY are paid to…No other authors reported any financial disclosures." Or "This work was supported by grant ABC from …Treatment and placebo capsules were donated by XYZ Company…" Please refer to JAMA or NEJM for model statements.

Conflict of Interest

Authors must disclose all relationships that could be viewed as presenting a potential conflict of interest.

Copyright Transfer/Publishing Agreement

Please fill out form on page 3 of the "Instructions to Authors" downloadable from the Website (http://www.hjmph.org). This form must accompany your submission or it will not be accepted.

Reprints

Authors will be able to download a PDF file of the Journal. A high-resolution PDF file will be available upon request.

Revised February 29, 2012