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The Need for a Standardized Evaluation Method to Assess Efficacy of Cultural Competence Initiatives in Medical Education and Residency Programs

Maria B.J. Chun PhD and
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Abstract

Cultural competence education is relatively new in the United States, particularly in the area of graduate and post-graduate medical education. There is, however, wide acceptance that an understanding of the role culture plays in the treatment and care of patients is critical. Numerous studies and a variety of commentaries document this importance, but valid, uniform evaluation methods for assessing the efficacy of these efforts is lacking. This review discusses existing evaluation efforts and makes suggestions regarding future development of such tools.

Introduction

Although cultural competence has been accepted as an important component of both graduate and post-graduate medical education in the United States, the need for valid, uniform evaluation methods for assessing the efficacy of cultural competence initiatives in medical and resident education looms large. There are numerous studies and a variety of commentaries that tout the value and significance of cultural competence. However, despite the apparent blanket acknowledgment that integration of cultural considerations in medical education is relevant for improved patient care and reduction of health care disparities, objective outcome or performance measures have still not been adequately formulated and rigorously evaluated.

A general overview of existing methods related to measuring program effectiveness of cultural competence initiatives is presented. Included are comprehensive reviews that analyzed the methodological rigor of existing studies and tools. Also, measures that have been statistically validated to some degree are described. Recommendations on what future work in this area should take into consideration are also provided.

Background

In response to the multicultural education movement and government-mandates related to the acknowledgment of cultural diversity initiated in the mid-1980s and 1990s, the field of medicine has identified and embraced the need for cultural competence training. Both the Liaison Committee on Medical Education (LCME) and the Accreditation Council for Graduate Medical Education (ACGME) have formal requirements related to cultural competence. However, basic, fundamental questions, such as defining both "culture" and "competence," have not been adequately addressed.

The "fuzziness" and "all-encompassing" nature of the term "culture" and what it means to be "competent" hinder progress in the field. However, attempts have been made to develop a broad, but focused definition of culture. For example, based on a definition developed by Cross et al. of the National Center for Cultural Competence, the Association of American Medical Colleges (AAMC) utilizes the following definition for cultural competence:¹

Cultural and linguistic competence is a set of congruent behaviors, knowledge, attitudes, and policies that come together in a system, organization, or among professionals that enables effective work in cross-cultural situations. 'Culture' refers to integrated patterns of human behavior that include the language, thoughts, actions, customs, beliefs, and institutions of racial, ethnic, social or religious groups. 'Competence' implies having the capacity to function effectively as an individual or an organization within the context of the cultural beliefs, practices, and needs presented by patients and their communities.

In a 2003 study by Pena Dolhun et al., an attempt was made to create an assessment tool that would help to standardize terminology in the area of cross-cultural education.² Culture was defined broadly and covered eight content areas: general concepts of culture, racism, doctor-patient interactions, language, specific cultural content, access issues, socioeconomic status, and gender roles/sexuality. A review of curricular materials from 31 United States medical schools revealed wide variation across schools as well as within schools regarding the degree to which a specific content area was covered. This lack of uniformity and standardization make it difficult to assess quality and effectiveness of cultural competence efforts.

Literature Reviews Critiquing Existing Cultural Competency Evaluations and Measures

Cultural competence initiatives abound, ranging from courses in cultural sensitivity to working directly with diverse patient populations in a multicultural environment. But, program evaluation for learning outcomes is lacking.^{3,4} Most evaluative studies on the effectiveness of cultural competence training have been weak scientifically.⁵ A review of the literature by Price et al. critiqued 64 articles dating from 1980 to 2003, commenting on the lack of methodological rigor in study design. Only 33 percent of the articles reviewed adequately described the study setting, the participants, and provided enough detail on the intervention to allow for the study to be replicated. Regarding use of comparison groups, only 13 percent of the articles utilized "treatment and control groups" (i.e. to determine whether any significant difference existed between a group that received cultural competence training versus one that had not). For outcome assessments, 42 percent of the articles utilized objective measures, such as written exams and direct observation. Finally, only 22 percent of studies documented the number and reasons for excluding data and the magnitude of statistical difference between groups.

In yet another review, Kumas Tan et al. searched the literature in October 2005 and identified 54 cultural competence measures frequently used in medicine, mental health, and other health professions.⁶ After this initial search, the authors then focused on ten of the most widely used measures and reported on the origins/development and psychometric properties of the measures, as well as the present format of each of the instruments. The ten measures reviewed were the: Multicultural counseling inventory (MCI), the Cultural self-efficacy scale (CSES), Inventory for assessing the process of cultural competence among health professionals (IAPCC and IAPCC-R), Cross-cultural adaptability inventory (CCAI), Quick discrimination index (QDI), Culture attitude scale or ethnic attitude scale (CAS/EAS), Multicultural awareness, knowledge, and skills survey (MAKSS and MAKSS-CE-R), Cultural competence self-assessment questionnaire (CCSAQ), Cross-cultural counseling inventory (CCCI and CCCI-R), and the Multicultural counseling knowledge

and awareness scale, formerly the multicultural counseling awareness scale-form B (MCKAS). Kumas-Tan et al. found the instruments somewhat limiting because of their primary focus on race and ethnicity. A broader definition was recommended to address a more expansive definition of culture, as with AAMC's definition of culture referenced previously. The authors' final summary statement was: "... that despite considerable progress, the health professions remain far from establishing valid methods for measuring skilled or competent practice across a wide range of social differences."⁶

A recent study on resident physicians also makes note of the lack of evaluative methods for assessing the efficacy of cultural competency efforts.⁷ Additionally, studies have found that medical student and resident training initiatives vary widely, which also make assessment difficult.^{2,3} The lack of consistency or standards across various programs prevents determination of effectiveness of method as well as whether the intervention has any lasting impact on a participant's behavior. Furthermore, most current studies

utilize a case study approach, making it difficult to generalize results because, by definition, case study methods are in-depth reviews conducted in a single setting and/or with a single subject.⁸

In the following sections, we present examples of tools that have been developed to specifically address cultural competency in medical student and postgraduate medical education. These tools take a broader approach to the definition of culture (i.e. go beyond race and ethnicity) and also attempt to consider cultural competency beyond the strictly individual perspective, which is the focus of most existing measures.

LCME Cultural Competency Requirements

In 2000, the LCME introduced the following standard for cultural competence:¹

The faculty and students must demonstrate an understanding of the manner in which people of diverse cultures and belief systems perceive health and illness and respond to various symptoms, diseases, and treatments. Medical students should learn to recognize and appropriately address gender and cultural biases in health care delivery, while considering first the health of the patient.

The AAMC cites examples of evaluation strategies, both quantitative and qualitative in nature, which would allow for assessment of cultural competence. These include standard surveying, videotaping, and pretest-posttests. Notably, the effectiveness of these methods have not been validated.

Cultural Competency Evaluation Methods for Medical Education

Tool for Assessing Cultural Competence Training (TACCT)

There have been limited attempts to standardize evaluation methods to assess cultural competence. The primary tool that has been developed, used, and is currently being validated is the Tool for Assessing Cultural Competence Training (TACCT), which was developed by the AAMC, to allow medical schools to examine the degree to which cultural competence components were integrated into their curriculum.¹ This self-administered assessment tool is a two-part grid. The first part, labeled “Domains” evaluates overall curriculum (i.e. “where teaching is occurring”) and assists identification of any potential gaps. The second part, labeled “Specific Components” allows identification of education for knowledge, skills, and attitudes (i.e. “what learning objectives are being met”).

The AAMC also acknowledged the TACCT’s limitations. Because of its descriptive, higher-level review, the TACCT may not take into consideration in-depth analysis of teaching strategies or learning outcomes. It also does not provide a formula or basis for a specific number of hours needed. Finally, the TACCT, does not account for informal learning that occurs outside of structured settings.¹

Lie, Boker, and Cleveland administered the TACCT to compare faculty and student perceptions of cultural competence instruction as part of a comprehensive curricular needs assessment.⁹ In 2005, 25 basic science and clinical course directors and 92 third-year medical students at the University of California at Irvine were surveyed. The research revealed that students were more likely than faculty course directors to respond positively to the survey items. The following rationale for the findings was that: 1) students were responding in terms of their broader experience as opposed to faculty who may have only viewed it within their own formal courses; and 2) students may have considered informal curriculum in their responses. In an attempt to make the TACCT more user-friendly and to eliminate any redundancy, Lie et al. developed a revised version of the scale, with the results pending publication.¹⁰

Interpreter Impact Rating Scale (IIRS) and Faculty Observer Rating Scale (FORS)

One of the key elements in the area of cultural competence is the use of interpreters when dealing with patients with limited English proficiency. Attempting to assess skill in this area, Lie et al. developed two measures.¹¹ The Interpreter Impact Rating Scale (IIRS) was created for standardized patients to assess students. The IIRS was designed to be patient-centered, used in any language encounter, be translated into another language, used by other health professions, and focused on observable behaviors. The Faculty Observer Rating Scale (FORS) was developed for the faculty to assess students. The FORS was designed to apply to any language encounter, used by faculty regardless of proficiency of the language in the encounter, and can be generalizable to different clinical situations.

Initially, the scales appeared to have good reliability, but concern was expressed regarding low correlation between the two scales. Lie et al.,¹¹ however, had also included an existing scale, the Physician Interaction Scale, which assesses communication skills, and found a strong correlation between this instrument and the IIRS. Additional validation efforts are pending.

ACGME Cultural Competency Requirements

In 1999, the ACGME approved six competencies required for resident education: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems based practice. Cultural competence falls under the “professionalism” competency, which the ACGME describes as: “Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.” The ACGME also requires that residency training programs have effective plans for assessing performance, which should include use of “dependable measures.”¹² The ACGME has suggested the use of the Objective Structured Clinical Exam (OSCE) and the 360 degree global rating as the “most desirable” methods for measuring sensitivity to culture.¹³ The Chart Stimulated Recall Oral Examination (CSR), checklist, and oral exam are considered the “next best methods,” with the portfolio as a “potentially applicable” method.

Cultural Competency Evaluation Methods for Resident Education

A validated method for specifically assessing the efficacy of resident education in the domain of cultural competency has not been identified in the literature. One of the more comprehensive attempts at constructing a tool to measure cultural competency at the postgraduate level is a self-report survey used in a nationwide study on resident physicians.¹⁴ The purpose of the survey was to measure preparedness to deliver high-quality care to diverse patient populations as opposed to focusing on particular cultures. Questions attempted to address the following areas: attitudes towards cross-cultural care, preparedness to care for diverse patient populations, self-assessment of skills, and reports of educational experiences. The stratified random sample included residents in their final year of training in emergency medicine, family practice, internal medicine, obstetrics/gynecology, pediatrics, psychiatry, and general surgery.

Weissman et al. report that the majority of the residents acknowledged that a patient’s culture is important when providing care.¹⁴ However, responses differed by specialty. For example, emergency medicine and surgery residents were less likely to report cultural considerations as “very important” (43 to 47 percent, respectively) compared with other specialties (67 to 94 percent). Approximately half of the residents, particularly those in emergency medicine, general surgery, and obstetrics/gynecology, reported that they received little or no cultural competence training in medical school. General surgery and emergency medicine residents were significantly more likely to report a lack of cultural competence training as compared with other specialties. Additionally, the lack of good role models or mentors for cross-cultural care was most significant for those two specialties. Notwithstanding, cultural competence has been deemed as most critical for emergency medicine and general surgery because

External Validity	Feasibility	Psychometric Characteristics
Specialty	Time required	Face validity
Who has been assessed?	No. of items	Content validity
Who has rated?	No. of raters needed	Criterion validity
Where has it been used?	Training needed	Construct validity
No. of sites	Equipment/technology	G coefficient
Setting	Development phase	Interrater reliability
No. assessed	Cost	Other reliability
No. of data points		
Sampling method		
Response rate		

of the importance of diagnostic accuracy and informed consent.¹⁵

In a precursor to the nationwide survey, a study utilizing focus groups and interview transcripts was done to assess residents' perceptions of preparedness to deliver care to diverse patients, educational climate, and training experiences.¹⁶ In general, residents reported little formal training, concerns with stereotyping, and although their institutions were in support of cultural competence it was viewed as a low priority area. Residents in psychiatry and family medicine were more likely to cite the importance of cross-cultural care, but made note of concerns with resource constraints. Emergency medicine and general surgery residents believed that culturally sensitive care was "unrealistic" due to time constraints.

Another focus group study involving family medicine residents cited a similar concern with time constraints negatively impacting attention to cultural issues.¹⁷ Other concerns included limitations in language and interpreter skills and patient shortcomings (e.g. patients expecting the physician to do everything for them). Faculty and patients were also involved in this study. Faculty commented on how resident expectations of patients were sometimes unrealistic. For example, faculty felt that residents should be more cognizant of socioeconomic factors that can impact a patient's ability to understand instructions regarding compliance, follow-up, and the disease itself. Patients appeared to be more concerned about generic communication skills, such as truly showing interest in the patient and involving the patient in any treatment decisions, as opposed to specific cultural issues.

Betancourt et al. list four recommendations to improve resident education in the area of cultural competence.¹⁵ First, cultural competence training should be integrated in all graduate medical education programs. Second, resident education should build on what is learned in medical school and incorporate practical tools and skills based on standard principles. Third, faculty should also receive training in cultural competence so they can serve as better mentors and role models. Fourth, residents should receive mandatory and

formal evaluations, with a standardized assessment tool, in the area of cultural competence.

Recommendations

When developing a standardized evaluation tool to assess the efficacy of cultural competence initiatives in medical education and residency programs, the following issues should be considered:

1. Simplify the term "culture" when referring to cultural competence. Simplification can be achieved by focusing on commonalities rather than differences. Essentially, cultural competence means the ability to respect and understand someone different from oneself. This approach does not intend to minimize uniqueness or diversity, but avoids overwhelming the student, resident, or practitioner who may feel they need to have specific knowledge of each "cultural" group. This would help to avoid concerns with stereotyping or having to learn about every "culture" an individual comes into contact with. This approach has been referred to as "cultural humility."¹⁸ Although presented as an opposing view to cultural competence, its meaning is essentially the same since both concepts acknowledge the importance of culture.

2. Develop and encourage clearer evaluation standards and related assessment tools when referring to cultural competence. Despite mandates from the LCME and ACGME, there appears little concrete guidance and consistency regarding how cultural competence is understood, implemented and measured.⁹ Although both accrediting bodies provide generic guidelines and examples, more assistance is needed with standardizing evaluative methods to ensure that what is being learned is actually translated into practice. Flexibility of program development is critical, and it is clear that faculty need to spend more time on assessing these outcomes as well as receive training on how to conduct evaluations.¹⁹ Smith et al. recommend conducting evaluations by assessing attitudes, knowledge, and skills of learners through a variety of methods, such as surveys and observations.⁷

3. Focus on behavioral interventions as opposed to attitude-only measures of cultural competence. Although assessing attitude is important, translating how one thinks and feels into action is paramount. A medical student, resident, and practitioner must actually make use of the cultural competence skills learned when dealing with patients and situations. Speaking to assessment of competencies in general, Klass advocated for a focus on behavior as opposed to attitude.²⁰ It is important to note, however, the value of both qualitative and quantitative measures.⁶ Standardization and objectivity is not limited to numbers; solely focusing on quantitative measures would eliminate the richness of qualitative

methods, such as content analysis. For example, in addition to using a survey, interviews with study participants can also be done to obtain a better understanding of why a certain response was made or given to question. It can also assist with improving the tool itself by providing feedback on whether the participant, for example, felt that the questions were confusing.

Utilizing ACGME's criteria for selecting assessment instruments and implementing assessment systems, we propose the following criteria – external validity, feasibility, and psychometric characteristics – be considered (See Table 1 for specific criteria under each category).²¹ The ACGME also provides examples, including a cultural competence measure, of how the criteria is applied.²²

4. Identify barriers that may negatively impact the ability to pursue cultural competence initiatives. Issues such as lack of time and limited fiscal and human resources need to also be taken into consideration.

Conclusion

The need for a standardized evaluation method to assess efficacy of cultural competence initiatives in medical education and residency programs is imperative. If positive outcomes cannot be demonstrated, then the value of cultural competence will be both questioned and lost. Existing tools, such as the TACCT, that have demonstrated a good degree of reliability and validity should be administered in a variety of settings and continually refined.

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Adrenal Insufficiency Secondary to Tuberculosis: The Value of Telemedicine in the Remote Diagnosis of Addison's Disease in Ebeye, Republic of the Marshall Islands

Lisabeth A. Bush MD; Lynne Ruess MD; Tom Jack MO; and Donald A. Person MD

Abstract

A young Marshallese woman presented with the insidious development of fever, cough, fatigue, profound weakness, massive weight loss, cachexia, alopecia, amenorrhea, and periumbilical hyperpigmentation. Limited laboratory studies revealed anemia, leukocytosis, and hyponatremia. Imaging studies, as well as digital photographs, transmitted over the Internet, using the secure Pacific Island Health Care Project (PIHCP), store-and-forward telemedicine system, suggested the diagnosis of disseminated tuberculosis, and antimycobacterial antibiotics were begun. Sputum cultures eventually grew Mycobacterium tuberculosis. Based on the constellation of clinical signs and symptoms, the transmitted images, and limited laboratory data, adrenal tuberculosis (Addison's disease) with adrenal insufficiency was diagnosed and corticosteroids were initiated. The patient responded dramatically. This case underscores the utility of telemedicine in the diagnosis and treatment of patients with unusual conditions, rarely seen today in the United States, from remote sites in the Developing World.

Introduction

The Pacific Island Health Care Project (PIHCP) was developed 20 years ago to provide tertiary medical care at Tripler Army Medical Center (TAMC) to indigenous peoples from the United States Associated Pacific Islands (USAPIs) and enhance Graduate Medical Education (GME) in the residency training programs at TAMC. Because of the great distances (i.e., Honolulu to Koror, Republic of Palau, more than 5,000 miles); massive area of Pacific Ocean (more than 7,000,000 square miles); and time differences (five time zones and the International Date Line); timely consultation and referral utilizing standard communication methods from remote islands of the Pacific had become almost impossible by the mid-1990s. With the availability of the Internet, even in the Developing World of the USAPIs, and with the technical expertise provided by Project Akamai (a Congressionally funded program at TAMC for the development and application of emerging technologies to health care delivery), the Medical Director (DAP) developed a simple, secure, store-and-forward telemedicine system for communication with health care providers and facilities in the remote USAPIs. The PIHCP telemedicine program has been operational for 10 years.¹⁻³ The present case highlights the potential of this simple system.

Case Report

A 19-year-old woman was admitted to the hospital in Ebeye, Kwajalein Atoll, Republic of the Marshall Islands (RMI) on March 10,

2005 with profound weakness, severe cachexia, and massive weight loss. She complained of nausea and vomiting 3-5 times daily that had worsened over the previous 5 months. Review of symptoms included: fever, chills, nonproductive chronic cough, amenorrhea, fatigue, weakness, hair loss, occasional diarrhea, and periumbilical discoloration or bruising. She had previously been well. Although she reached menarche at age 14 years, she had not had a menstrual period in 5 months.

Physical examination revealed a severely cachectic, emaciated young woman weighing 57 pounds (28.5 kg) (Fig. 1). Her family reported that she was bed bound at home, weak, sleeping all day, and refusing to eat. She was so weak that she had difficulty even sitting up at the edge of her bed. She had alopecia, pale conjunctivae, dental caries, but no oral lesions or enamel erosions which might suggest bulimia or other eating disorder. A single non-tender lymph node (approximately 1x1 cm) was palpable in the right anterior cervical chain. Her abdomen was scaphoid, without masses or hepatosplenomegaly. She had "periumbilical bruising" (Fig. 2) and minimal bilateral costovertebral angle tenderness. Her development was Tanner stage 4 and her pelvic examination was normal.



Figure 1.— The patient at presentation with cachexia and alopecia



Figure 2.— Periumbilical hyperpigmentation at presentation



Figure 3.— Chest radiograph with adenopathy and bilateral upper lobe disease.

Her premonitory weight had been 90 lbs (40.8kg), her weight in January 2005 was 70 pounds (31.8kg), and she weighed 57 pounds (28.5 Kg) in March 2005 at the time of referral. The results of the few initial laboratory tests that were available and posted with the original consultation included: a complete blood count with WBC, $19.4 \times 10^9/L$; hemoglobin, 9.0g/dL (down from 11.5g/dL the previous month), hematocrit, 28.1%; (MCV 83.6, MCH 26.8, MCHC 32.0); and platelets, $580 \times 10^9/L$. Her serum sodium was 127mmol/L; chloride, 101mmol/L; and blood urea nitrogen, 7mg/dL. Sputum smears for acid fast bacilli (AFB) were negative x3. PPD was negative, as was a test for HIV.

Initially, four photographs of the patient, along with her chest X-ray, were posted on the Web site. Because of her prominent gastrointestinal symptoms and signs, various consultants at TAMC, who had been forwarded the case by the medical director, requested additional imaging and laboratory studies. Medical facilities, laboratory, and radiology support on the island of Ebeye are extremely limited. Basic blood counts, urinalysis, a few chemistries, and simple X-rays are intermittently available. Nearby on Kwajalein Island, at the headquarters United States Army Kwajalein Atoll (USAKA), there is a modern well equipped, 10-bed hospital, in support of the 5,000 – 6,000 US contractors and approximately 100 active duty personnel and their dependents who live and work on Kwajalein. Modern diagnostic equipment is available there, and the patient's physician (TJ) requested that Kwajalein's ultrasound technician scan the patient's abdomen. Subsequently 30 static ultrasound images were attached to the patient's Web page.

After review of all of the images posted on the Web site (PA chest X-ray and 30 ultrasound images) the Consulting Radiologist (LR) described bilateral upper lobe disease and adenopathy on the chest X-ray consistent with pulmonary reactivation tuberculosis. The findings on the abdominal ultrasound were consistent with mesenteric adenopathy and the patient's echogenic, enlarged liver was considered to be due to fatty infiltration associated with her severe malnutrition. The adrenal glands were not specifically identified. The ultrasound technician scanned the patient's abdomen on a one-time basis. She was unaware of the diagnostic possibilities and was not directed by a radiologist. There are no radiologists in most of the Pacific Islands.



Figure 4.— Abdominal ultrasound with matted hypoechoic masses consistent with mesenteric adenopathy

While the radiologic findings were consistent with disseminated tuberculosis, her many other signs, symptoms and laboratory findings required explanation. Sputum cultures were obtained and sent off island. She was begun empirically on Isoniazid 300mg, Rifampin 600mg, Pyrazinamide 1g, Ethambutol 800mg, and Vitamin B6. Taking into account the patient's history, physical findings, course, photographs, ultrasound images, and chest X-ray, the medical director suggested the diagnosis of Addison's disease. This was supported by the findings of amenorrhea, cachexia, severe weakness, marked fatigue, alopecia, periumbilical and facial hyperpigmentation, hyponatremia, and ultrasonographic evidence of peritoneal tuberculosis (tabes mesenterica). The consulting pediatric endocrinologist agreed with the diagnosis of Addison's disease and recommended starting hydrocortisone 10mg in the morning and 5mg in the afternoons. (10-12 mg/M²/day in two doses). She also suggested that a fasting morning serum sample be obtained for a cortisol level. The sample was collected and sent abroad. (The sample was apparently lost and the results were never reported. This is an all too common situation in the remote Pacific.) The sputum samples eventually



Figure 5.— Patient images demonstrating the dramatic response to treatment a) 2months and b) 6 months after initiating therapy

grew *M. tuberculosis*. She responded rapidly to combined (anti-mycobacterial antibiotics and hydrocortisone), directly observed therapy and within two months, she was remarkably improved. Her weight had increased to 92 pounds. Her hair was growing back, the hyperpigmentation was lessening, and she had resumed her daily activities. The hydrocortisone was eventually discontinued without any adverse effects.

Discussion

This case is reported not so much to prove or disprove the patient's Addison's disease, rather it demonstrates the remarkable utility of a simple telemedicine system in saving this young woman's life. She was arguably just days from lapsing into coma and death. The similarities of our patient with those first described by Addison prompted this report.

When Thomas Addison initially described the findings of adrenal insufficiency in the London Medical Gazette in 1849, in "Chronic Suprarenal Insufficiency, Usually due to tuberculosis of Suprarenal Capsule", tuberculosis was the most common etiology.² Later, in his monograph "The Constitutional and Local Effects of Disease of the Suprarenal Capsule" published in 1855, he pioneered the study of the adrenal gland and its related physiology. In this work he described the symptoms of a group of eleven patients with enlarged adrenals whose presentations were strikingly similar to that of our patient.

"The leading and characteristic features of the morbid state to which I would direct your attention are, anaemia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of the colour in the skin, occurring in connection with a diseased condition of the suprarenal capsules...The discoloration pervades the whole surface of the body, but is commonly most strongly manifested on the face, neck, superior extremities, penis, scrotum, and in the flexures of the axillae and around the navel."³

The patient's, chest radiograph findings of hilar adenopathy and

bilateral upper lobe disease as well as the mesenteric adenopathy identified by abdominal ultrasound were most consistent with *M. tuberculosis* disease, which is rampant in the RMI. The RMI has one of the highest rates of tuberculosis of any of the USAPIs. In 2005, 66 cases of TB were identified (no doubt a great underestimate) in the RMI, a rate of 111.7 per 100,000. This is roughly double the rate seen in the other USAPIs while the rate in the United States is 4.8 cases per 100,000.⁴ Nearly 25% of all patients consulted or referred to the PIHCP have or have had tuberculosis. A disproportionate number of cases come from Ebeye, one of the most populous places on earth with a population density of 66,000 per square mile. Some notable pediatric cases have originated there.⁵

Tuberculosis infection can linger in untreated individuals with delayed expression of adrenal insufficiency up to 10-15 years after initial infection.² Conversely, in others, the disease progresses inexorably ultimately to death. Interestingly, our patient's family name is the same as a child from Ebeye the medical director treated 15 years ago. He was 8 years old at the time and had disseminated tuberculosis manifested by CNS (tuberculomas and meningitis), bone, joint, liver, renal, and gastrointestinal involvement. He also had miliary disease. When he arrived at TAMC he was dying. He was treated aggressively (to include steroids), and over a period of several weeks of hospitalization he was restored to health. All attempts to determine whether they were related were unsuccessful. In all likelihood, they were brother and sister.

The patient's hyponatremia is characteristic of the deficit of mineralocorticoids, which normally stimulate the kidney, gut, salivary and sweat glands to conserve sodium and excrete potassium.⁶ Adrenal insufficiency manifests itself as hypoglycemia and the patient may become ketotic as the body mobilizes fatty acids. Anorexia, nausea and vomiting occur frequently, as was seen in our patient.⁷ Cortisol deficiency allows uninhibited production of ACTH and other peptide hormones which may increase pigmentation particularly in scars, creases, mucosa, and gingival, and in light-skinned

patients may cause a bronzed appearance.⁶⁻⁸ We believe our patient's periumbilical hyperpigmentation was a classic manifestation of her disease as Addison described. Laboratory findings also supported the diagnosis, as she had low glucose (81 mmol/L) and low serum sodium (Na 127). The most definitive test of adrenal insufficiency is a low resting level of cortisol with an elevated ACTH level or a low level that does not increase normally after administration of ACTH.⁷ Serum for cortisol level was sent off island for analysis as is indicated above; however, the results were never reported. Her negative PPD was no doubt, a reflection of anergy secondary to disseminated tuberculosis. Her depleted adrenocortical state was probably contributory.

On the mainland United States, and other industrialized nations, autoimmune Addison's disease has outstripped infectious causes.⁸ It was proposed (perhaps somewhat facetiously) by the Editors of the *Pediatric Infectious Disease Journal* that Addison's disease be renamed for a more renowned individual affected with autoimmune adrenal dysfunction, and call it "JFK disease".⁹ We contend that we should not be so quick to rename Addison's disease as suggested. This would be a great loss, both for the recognition of the pivotal role Addison played in the early elucidation of adrenal function and the important reminder to consider infectious causes of adrenal failure. This case highlights important differences between autoimmune and infectious Addison's disease. Addison's disease caused by tuberculosis is treatable and curable. Long term corticosteroid replacement therapy is not necessary as adrenal function returns with the irradiation of the tubercle bacillus.

In conclusion, we present a classic case of Addison disease: adrenal insufficiency due to disseminated *Mycobacterium tuberculosis*. *M. tuberculosis* remains prevalent in many parts of the world,⁷ and while relatively rare in industrialized countries, worldwide *M. tuberculosis* is probably still the most common cause of primary adrenal insufficiency.¹⁰ In our patient, recovery of adrenal function occurred after administration of corticosteroid replacement, along with appropriate antimycobacterial therapy. We must continue to consider and to recognize disseminated tuberculous infection as a cause of anergy and adrenal insufficiency to avoid delay in lifesaving treatment. Finally, the simple store-and-forward telemedicine system provided by the PIHCP allowed for the diagnosis, treatment, and full recovery of a young woman, (dying of Addison's disease due to disseminated tuberculosis) without ever leaving her home in the remote Developing World of the Pacific.

Authors' Note:

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

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Recurrent Epiphrenic Diverticulum After Transabdominal Diverticulectomy: Report Of A Case And Review Of The Literature

Timothy P. Plackett DO; Colin A. Meghoo MD; and Dennis L. Febinger MD

Abstract

Epiphrenic esophageal diverticula are uncommon esophageal disorders; reported recurrence after surgical treatment is rare. We describe a case of recurrence in a patient previously treated with a transhiatal diverticulectomy, myotomy, and fundoplication. Anatomic factors that may have contributed to this recurrence are discussed.

Case Report

A 52-year-old man presented with a several-month history of dysphagia, postprandial retrosternal chest pain, and a choking sensation while recumbent. His surgical history was notable for a transabdominal stapled diverticulectomy, Heller myotomy, and Nissen fundoplication for similar symptoms four years prior (Figure 1). His original myotomy extended from the neck of the diverticulum to two centimeters distal to the gastroesophageal junction onto the stomach.

A barium esophagram identified a six centimeter epiphrenic diverticulum, two centimeters proximal to the gastroesophageal junction (Figure 2). There was no evidence of distal stricture or esophageal mass on endoscopy.

Surgical repair for this symptomatic recurrent diverticulum was performed through a left posterolateral thoracotomy. The esophagus was mobilized from the arch of the aorta to the hiatus and a five by four centimeter diverticulum was identified. A stapled diverticulectomy was performed over a 50-French bougie in the esophagus. The diaphragm was divided radially and the previous Nissen wrap was taken down. A longitudinal extramucosal esophagomyotomy was performed from just below the arch of the aorta to two centimeters onto the gastric corpus. A modified Belsey Mark IV fundoplication was added.

Three days after surgery an upper gastrointestinal series with gastrograffin and barium confirmed the absence of leaks (Figure 3). The patient resumed oral intake and was discharged on postoperative day ten. On fifteen-month follow up, the patient's original symptoms have resolved, and no recurrence of the diverticulum was seen on radiographic examination.

Discussion

Epiphrenic diverticula are pulsion diverticula of the distal thoracic esophagus, occurring within the distal ten centimeters of the esophagus. They account for less than 10% of all identified diverticula of the esophagus.^{1,2}

The natural history of epiphrenic diverticula is not fully established. The largest series in the surgical literature reported on 112 patients with an epiphrenic diverticulum.³ Of these patients, 71 (63%) had absent or minimal symptoms. Among patients from this group available for long-term followup (median time of 6.9 years), none had clinically significant progression of symptoms. The rare reports of malignant degeneration of esophageal mucosa within a diverticulum occurred typically in symptomatic patients and may not justify resection in the asymptomatic individual.⁴ Such data sup-

port non-operative management of the asymptomatic or minimally symptomatic patient.

Indeed, the majority of epiphrenic diverticula are asymptomatic and incidentally found on radiographic examination. However, some diverticula, often associated with an underlying hypertonic esophageal abnormality, may produce symptoms of dysphagia, regurgitation, aspiration, retrosternal chest pain, and heartburn. Medical therapy may play a role in the management of the minimally symptomatic patient with a small diverticulum.⁵

An esophageal motility disorder is seen in association with epiphrenic diverticula in 60-100% of cases and may precipitate their formation.^{3,6-8} As such, the inclusion of an esophageal myotomy, when surgical repair is indicated, is considered essential. Indeed, 12 of 15 reported cases of recurrence of epiphrenic diverticula after surgical intervention occurred in patients who had diverticulectomy without myotomy performed.^{1,6,8-16} (Table 1) The extent of this myotomy, however, remains a topic of debate.

Most studies advocate distal extension of the myotomy at least two centimeters onto the stomach to relieve outflow obstruction; suggestions for proximal extent of the myotomy vary greatly. Proposed proximal site have included everywhere from the arch of the aorta^{5,17} to as low as the caudal end of the diverticular neck.⁷ A proximal extent of a surgical myotomy based on preoperative manometric findings has been advocated by several authors and allows for individualized therapy based on the associated esophageal motility disorder.^{6,18}

Distal extension of myotomies onto the stomach and disruption of the lower esophageal sphincter mechanism have lead to the routine use of fundoplication at the time of the initial surgery to prevent esophageal reflux. Case series utilizing a complete fundoplication report no recurrence of the diverticulum or significant reflux symptoms in follow ups ranging from 3-4 years amongst their patients.^{1,11} However, many authors have advocated against a total wrap given



Figure 1.— Initial barium esophagram identifying an epiphrenic esophageal diverticulum.

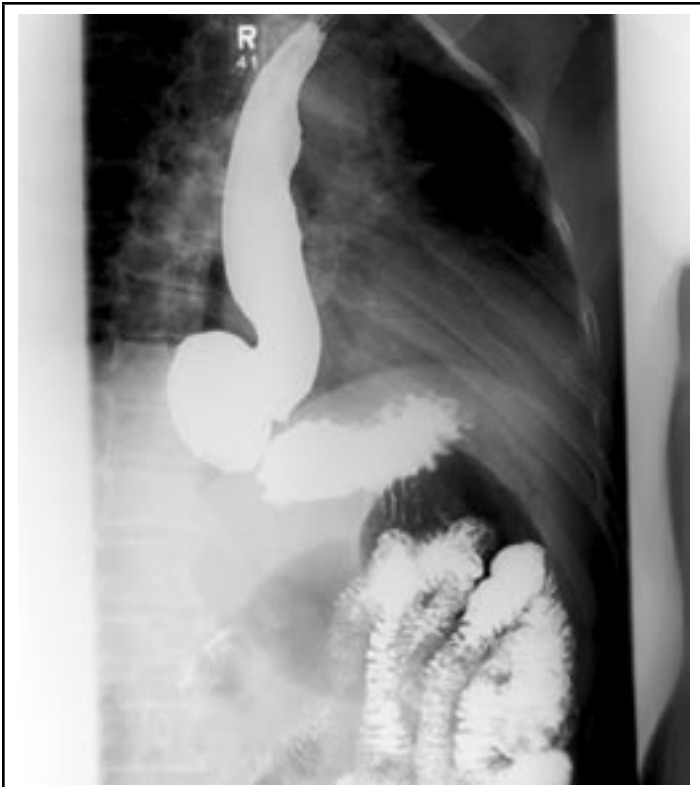


Figure 2.— Barium esophagram with recurrent epiphrenic esophageal diverticulum.

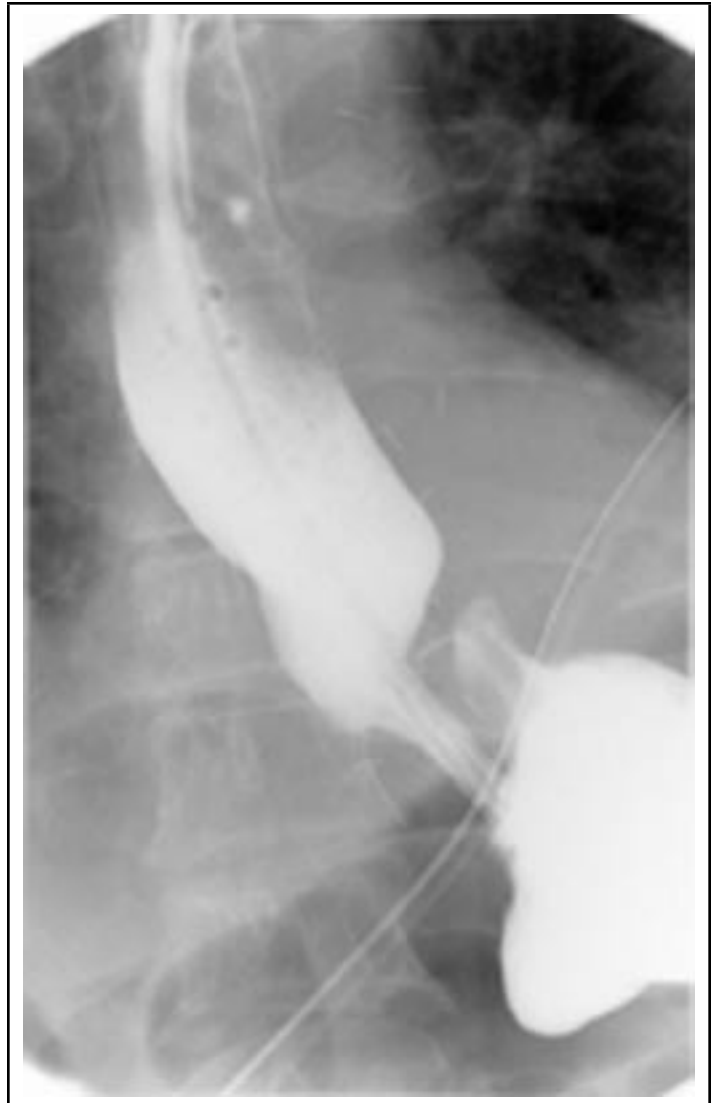


Figure 3.— Postoperative barium esophagram.

Table 1.— Reported cases of recurrence and initial surgery

Author	Patients	Diverticulectomy	Esophagomyotomy	Fundoplication	Time to Recurrence
Habien 1956 ⁹	1	+	-	-	1 mo
Habien 1956 ⁹	3	+	-	-	NR
Allen 1965 ¹⁰	1	+	-	-	6 mo
Debas 1980 ⁸	1	+	-	-	NR
Mulder 1989 ¹¹	1	+	-	-	3 yrs
Altorki 1993 ¹³	1	+	-	-	NR
Benacci 1993 ³	2	+	-	-	NR
Hudspeth 1993 ¹²	1	NR	NR	NR	NR
Nehra 2002 ⁶	1	+	+	NR	NR
Fraiji 2003 ¹⁴	1	+	-	-	20 yr
Del Genio 2004 ¹⁵	1	+	-	-	NR
Valentini 2005 ¹⁶	1	+	+	+	2 mo

NR = not reported

the perception that this type of wrap may increase pressure in the lower esophagus and creates a new obstacle to esophageal outflow. Recently, Stroh and colleagues reported on the formation of a symptomatic epiphrenic diverticulum in a morbidly obese patient five years after placement of a constricting lap band, further suggesting that an extrinsic outflow obstruction can precipitate a diverticulum.¹⁹ It is reasonable to suggest that our patient's prior Nissen fundoplication may have also contributed to his recurrence.

Given the successful application of laparoscopic techniques to the management of achalasia, many authors have published their experience with laparoscopic approaches to surgical therapy.^{20,21} Over the last several years transabdominal and, in particular, laparoscopic approaches to the management of these patients have become more popular. The operative benefits of laparoscopic versus an open thoracotomy include better visualization of the distal extent of the myotomy and greater ease of fundoplication. However, the use of a laparoscope can limit the extent to which an esophageal myotomy can reach into the mediastinum. As a result, shorter myotomies are becoming more common. A trans-thoracic approach, while traditionally associated with greater perioperative morbidity and longer post-operative hospitalization,^{3,21} offers better exposure of the esophagus and permits a longer myotomy which may reduce the risk of recurrence.

While a thoracoscopic approach may ultimately offer the benefits of minimally invasive surgery with ready access for performing a complete myotomy, current reports have been hampered by small case series, high morbidity,²² or short term followup.²⁰

For our patient, we believe that the initial limited myotomy did not adequately treat a likely underlying esophageal motility disorder; in addition, a total fundoplication created a functional obstruction to outflow. The combination of these two factors led to the recurrence of this patient's diverticulum after four years. We believe that a thoracic approach for the primary repair of epiphrenic diverticula may decrease the chance of recurrence by allowing for a longer esophagomyotomy. We argue that a total fundoplication should be avoided in all cases.

Authors' Note:

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Student Profile, Class of 2012, John A. Burns School of Medicine (JABSOM), University of Hawai'i

Satoru Izutsu PhD, Senior Associate Dean; Chair, Admissions Committee

On July 25, 2008, in the presence of 600 family members, friends, and faculty, thirty-four women and twenty-eight men received their first white coats as student-doctors and were welcomed into the community of physicians. Representing the medical community was the JABSOM Class of 1987, whose 25th anniversary reunion will coincide with the incoming class in four years.

The keynote address was delivered by Dr. Jill Omori, Class of 1995 who spoke on the "The Heart of Medicine". She reminded the class, "...You must start to look beyond the diseases and the stereotypes and start to see and hear your patients as individuals; their stories, their adventures, their hopes, and their dreams. You must remember your own dreams and passions, and always reflect on your reasons for entering this noble profession."

1895 candidates applied for 62 positions.¹ Of this number, 231 qualified and followed through to be interviewed. Finally, 62 were selected, 56 are residents and 6 are from out-of-state. Forty-eight were new applicants and 5 re-applicants. Eight were from the Imi Ho'ola post-baccalaureate program. There was one "Delayed Matriculation". The ages ranged from 21-33, with an average of 23.

JABSOM is a very diverse school. This fact was illustrated again this year by: 15 Japanese; 10 Chinese, Chinese/Other; 10 White; 6 Mixed Asians; 4 Declined to Respond; 4 Japanese/White; 3 Chinese/Native Hawaiian, Other; 3 Korean; 2 Filipino; 1 Native Hawaiian; 1 Okinawan White; 1 Other Pacific Islander (Micronesian); 1 Samoan; 1 Vietnamese.

Twenty-nine percent graduated from public high schools; 10% from Mainland high schools; 1.5% from Pacific Basin high schools; 53% from private high schools; 5% from foreign schools; and, 1.5% from other. Forty-five graduated from colleges on the Mainland; 15 from Hawai'i colleges; 2 from foreign colleges. Of the total, 9 attended graduate colleges. All students have Baccalaureate Degrees; in addition, eight have Master Degrees; and one has a law degree.

The academic credentials for the entire, entering class were: Median Cumulative Grade Point Average (GPA), 3.67; and, median Science GPA, 3.64. Medical College Admissions Test (MCAT) median scores were: Verbal Reasoning- 10; Physical Sciences-10; Writing Sample-P; and, Biological Sciences-10. Median MCAT total score was: 30.

The process of entering the John A. Burns School of Medicine is similar to that used by 129 U.S. medical schools accredited by the American Association of Medical Colleges. All applicants must sit for the Medical College Admissions Test (MCAT) and apply through the American Medical College Admissions Service (AMCAS). This service compiles transcripts, academic data and personal histories to send to the schools designated by the applicant.

At the John A. Burns School of Medicine, applicants who pass the academic screen are assigned two interviewers. At the end all applicants meet the Senior Associate Dean who is also Chair of the Admissions Committee. The interviewers (49 faculty, regular and clinical, and fourth year medical students) are interested in learning about the applicant as a person. MCAT and GPA scores are not transmitted to the interviewers. Interviewers receive all es-

says, the personal history from AMCAS and two from JABSOM that request: 1) "Describe succinctly the important experience(s) in your life which began the process that motivated you to enter the career of medicine" and 2) "Please explain why you are applying to the University of Hawai'i John A. Burns School of Medicine". The interviewers are interested in assessing an applicant's leadership skills, interpersonal skills, quality of compassion to help people, and stamina and motivation to pursue at least seven-eight years of training and education. The meeting with the Committee Chair verifies that all questions and issues related to admissions are answered in a timely and factual manner.

The Admissions Committee for the Class of 2012 was composed of 10 members: 6 clinicians, 3 basic scientists, and 1 social scientist. There were 3 women and 7 men who represented the major ethnic groups in Hawai'i and age levels. They met 20 times beginning in September and ending in April. The activities of the Committee were as follows: a few days prior to a meeting, the dossier of the applicant to be discussed was assigned randomly to a member of the Committee. The member examined the AMCAS folder that consisted of: MCAT scores, academic transcripts, the personal history statements, interview reports, and essays requested by JABSOM. In addition, the members reviewed the applicant's hard copy letters of recommendations in their folders. The respective committee member, at the meeting, followed a pre-determined sequence in reporting the highlights of each section of the dossier. Questions were from members of the Admission Committee. When the Chair of the Admissions Committee determined that there was an understanding of the "whom" and "what" of the candidate, he called for a secret ballot. Each member cast a confidential ballot by rating the candidate from 1-10, not discussed, and submitted to the Registrar (Marilyn Nishiki) who averaged the ratings. The Chair did not vote.

In April 2008, these ratings were ranked after all applicants had been evaluated. Fifty-two were notified of acceptances. The "wait list" was determined by the first natural "cut-off" of the rank order. Each year, up to ten from the Imi Ho'ola Program are added, if they complete successfully the one-year Post Baccalaureate Program. Up to 10% of the class (6) may be Out-of-State (non-resident) candidates who are considered from a separate rank order. In an entering first-year class, there are generally 56 who are "residents" and 6 who are from out-of-state.

The Class of 2012 is well on its way. It is now the challenge for the student, teachers, and family to ensure that these talented and gifted young women and men are given every support and opportunity to succeed. The basic ingredients of becoming outstanding physicians to serve humankind are imbedded in each student. Dr. Omori ended her welcoming speech with, "...So as you put on your white coats this evening and recite the Hippocratic oath, listen to the words carefully and do not disregard their meaning, and let it help to guide you over the next four years and beyond."

Reference

1. Data compiled by Marilyn Nishiki, Registrar and Nicole Sodehani, Instructional and Student Support.



Issues in Medical Malpractice XXXI

S.Y. Tan MD, JD, Professor of Medicine, John A. Burns School of Medicine, University of Hawai'i

Question: When signing out to a colleague prior to going on vacation, which of the following is best?

- A. A busy and successful specialist who works in the same hospital.
- B. An emergency room physician who is willing to respond to your patients who may be in need of urgent medical assistance.
- C. A trustworthy colleague with the best attitude regarding covering on a reciprocal basis.
- D. A new doctor in town who has lots of time to answer patient calls.
- E. It is best to instruct your assistant to refer all calls to the nearest hospital so as to escape potential liability.

Answer: C. It is better to have a trustworthy colleague who has a good attitude towards covering for your patients than a skilled but overworked practitioner who considers it another burden to shoulder. Thoughts of suing the doctor begin with poor service, frustration, and anger, even before any substandard care is provided. Through impatience and oversight, the covering colleague can easily put the original doctor at risk. Good communication skills and proper attitudes are every bit as important as clinical knowledge.

It may be insufficient to simply refer all calls to the emergency department. Doctors generally have a duty to secure coverage for their patients when they are unavailable or not on call. Of course patients should always be reminded that they should proceed immediately to the nearest emergency department if they have a serious symptom or are unable to contact the doctor. Such advice should be part of any pre-recorded phone message from the doctor's office.

Communication

What prompts a malpractice claim are poor communication and perception that the physician is at fault, rather than bad outcome *per se*. In one report, the authors found that quality of treatment as judged by peer review was not different in frequently-sued versus never-sued obstetricians and gynecologists.¹ In another on the relationship between malpractice and patient satisfaction, patients of doctors with prior malpractice claims reported feeling rushed, feeling ignored, receiving inadequate explanations or advice, and spending less time during routine visits when compared to patients of doctors without prior claims.² Beckman et al have documented that communication problems exist in over 70% of malpractice cases, with these problems centering around four themes: 1) Deserting the patient; 2) Devaluing patient/family views; 3) Delivering information poorly; and 4) Failing to understand the patient/family perspective.³

In a telling study by Lester and Smith, the authors asked 160 adults to view a videotape of a clinical encounter that resulted in complications. In one scenario, the doctor used positive communication behaviors (e.g., eye contact, friendly tone of voice), and in another, negative communication behaviors (e.g., no smiling expressions, harsh and clipped tone of voice).⁴ The videotape viewers, as a group, expressed the belief that negative communication behaviors by the

physician increased litigious intentions, prompting the authors to conclude:

"...positive communications would result in less litigiousness because the physician is viewed as having cared about the patient and thus having acted in good faith. In the world of relating, good faith counts for a lot: one's reading of good and bad faith tends to define who is a malicious villain and who is a fallible human being. On the other hand, negative behaviors tend to communicate lack of concern and even antagonism and may be seen by patient as a violation of the unwritten but inherent "caring" nature of the physician-patient relationship. Long before there is any medical outcome to be concerned about, the patient may believe that the physician has already done something "wrong" simply by relating in what is perceived to be an uncaring manner. This may set the stage for later retaliation if something does go wrong."

Talking with Patients: Listening actively to patients is a basic function of a good doctor. This means more than attentive listening. The doctor should show his or her understanding of what had just been said by the patient. This reassures the patient that the doctor has heard and understood the questions or concerns. Body language is important too. Experts tell us that 55% of information conveyed in a normal conversation occurs via non-verbal means. The percentage may be even higher in a medical encounter. And being able to explain the condition, procedure, or medication in simple lay terms is a worthwhile goal. During the course of a good doctor-patient relationship, the physician can effectively reduce the odds of being sued by educating the patient regarding the scope and limitations of medical care, and the patient's own responsibilities in complying with medical advice, medication, and follow-up.

The physician should give patients ample opportunity to tell their story and to ask questions. In a well-publicized study, only 23% of patients were able to complete their opening statement before the doctor interrupted, which occurred, on the average, 18 seconds after the patient began to speak!⁵

Telephone Communication: The four basic rules are 1) Listen and instruct carefully, 2) Insist on seeing the patient or have the patient go to the emergency department if there is any doubt, 3) Ask the patient (or pharmacist) to repeat your instructions or orders to minimize miscommunication, and 4) Document everything in writing. Risk managers warn in particular of calls concerning abdominal or chest pain, high fever, seizures, bleeding, head injury, dyspnea, tight orthopedic casts, visual complaints, and onset of labor.⁶ And practice consultants recommend getting rid of "confusing menus, canned ads, irksome music, assurances that 'your call is important', and waits that border on eternity."⁷

This article is meant to be educational and does not constitute medical, ethical, or legal advice. It is excerpted from the author's book, *"Medical Malpractice: Understanding the Law, Managing the Risk"* published in 2006 by World Scientific Publishing Co., and available at Amazon.com. You may contact the author, S.Y. Tan MD, JD, at email: siang@hawaii.edu or call (808) 728-9784 for more information.

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The Legacy of “Miracle Mineral”: Asbestos and Cancer

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Asbestos, a known carcinogen, was once considered as “miracle mineral” and had been extensively used in building materials and military equipment because of its durability, heat-resistance and low cost. Thousands of people have died because of the pathogenic effects of asbestos, and millions of people that have been exposed to asbestos are now at risk for developing asbestos related disease. To understand the mechanisms of how asbestos induces cancers and to find the cure become more and more crucial.

Introduction

Asbestos refers to a group of fibrous silicate minerals with a crystal-line structure. Asbestos is naturally widely distributed around the world. In the United States, asbestos has been found in 20 states and mined in 17 states.¹ The word asbestos comes from the Greek language, meaning “inextinguishable”. Because of its unique properties, asbestos was once called “miracle mineral”. It is strong, flexible, low electrical conductive and incredibly resistant to heat and chemicals, hence, there have been thousands of applications for asbestos. For example, asbestos has been extensively used as insulation material in shipyards and many other industries. It has also been widely used as a heat/fire-proof material in making fire doors, heat-resistant gloves and protective clothing. The most common usage of asbestos is in construction materials like asbestos cement, roof sheeting, roof tiles, and plumbing pipes.

There are two major subfamilies of asbestos minerals: serpentine and amphibole. Serpentine is represented by chrysotile, also known as “white asbestos”; amphibole includes five types of asbestos, two of which are more commonly commercially used. These two types are crocidolite, which is also known as “blue asbestos”, and amosite, which is also known as “brown asbestos”. The other three types are anthophyllite, actinolite and tremolite. Amphibole asbestos fibers have similar crystalline structures. They are straight and rigid, and they can only be distinguished based on their different chemical compositions. In contrast, chrysotile displays a characteristic physical structure. Its curly shape easily distinguishes it from amphibole’s needle-like structure (Figure 1).

The first commercial asbestos mine was a chrysotile mine, which was opened in Quebec, Canada, in the 1870s. Mining of crocidolite started in South Africa in the end of the 19th century. Shortly thereafter, asbestos was widely used industrially in the United States and Europe, especially between the 1940s and 1979. During World War II, huge amounts of asbestos were imported into the United States and allied countries to be used in building shipyards, naval and merchant vessels as well as war vehicles.

In the state of Hawai‘i, asbestos is a major environmental concern because of the Pearl Harbor shipyards, where asbestos was heavily used. Moreover, a factory called Vermiculite of Hawai‘i, received over 6,000 tons of asbestos contaminated vermiculite during the years 1967-1983 from the Libby mine.² This vermiculite was processed in the factory formerly located at 842A Mapunapuna Street, Honolulu, potentially exposing 13,051 people who lived within a half-mile radius. This is by far the largest number of people potentially exposed to Libby-Montana contaminated vermiculite, according to the US Environmental Protection Agency.

Asbestos related malignancies:

The pathogenic effect of asbestos was first noticed when many asbestosis cases were reported among textile workers who had been exposed to large amounts of chrysotile asbestos. Subsequently, Doll et al discovered the link between asbestos exposure and lung cancer in 1955.³ The association between asbestos and mesothelioma was discovered by Wagner et al in 1960.

Mesothelioma

In 1960, Wagner et al first reported a malignant mesothelioma (MM) epidemic in individuals working and living in the vicinity of crocidolite mines in the North Cape Province, South Africa.⁴ This finding first established MM as a definite disease and crocidolite asbestos as the cause. It also suggested that domestic and general environmental exposure to crocidolite could increase the risk of developing mesothelioma. Since then, MM has been reported in many crocidolite miners and millers, in manufacturers of crocidolite filter paper, gas masks and many other crocidolite-exposed workers, as well as people who worked in shipyards and naval/merchant marine service. Although MM was extremely rare before the 1950s, in fact, the first case of MM was reported in 1947, with the widespread use of asbestos in the past century, the incidence of MM has increased significantly.

MM is a very aggressive cancer of the mesothelial cells that form the membranes of the chest and abdominal cavity. The prognosis of MM is poor, and the median survival time is about one year. MM causes approximately 2,500 deaths per year in the United States and about 5,000 deaths per year in Western Europe. Two-thirds of MM patients are diagnosed between the ages of 50 and 70 because the latency period between initial asbestos exposure and the development of MM is about 30 years.⁵ Men are at a much higher risk for MM than women, probably because of occupational exposure. The incidence of MM is increasing worldwide and it is expected to reach its peak in the period of 2015-2020, with a predicted incidence

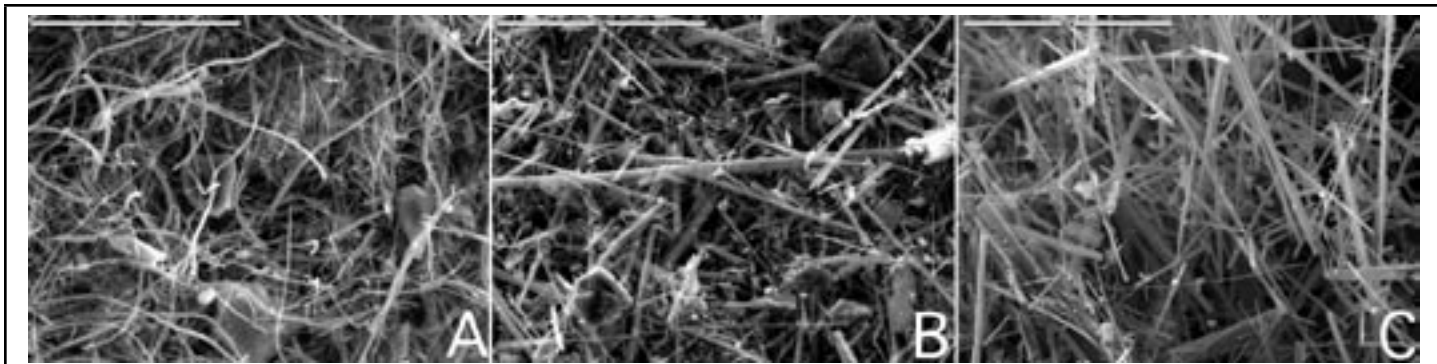


Figure 1.— Scanning electron micrograph of chrysotile (A), crocidolite (B) and amosite (C).

of 250,000 cases over the next 40 years. About 70,000 new MM cases are expected in the United States over the course of the next 20 years.⁶

Lung Cancer

Lung cancer is one of the major causes of death worldwide and it accounts for approximately 12% of all cancer deaths. In 1955, Doll et al published the mortality study of a cohort of asbestos-exposed workers in a textile factory located in Rochdale, United Kingdom, which first linked the asbestos exposure to lung cancer.³ This link was further suggested by the publication of Selikoff and Churg in the Proceedings of the New York Conference in 1965.⁷ Since then, more and more clinical data showed that patients with asbestosis have a high risk of dying of lung cancer. In 1979, based on the analysis of almost 1.78×10^5 insulation workers, Selikoff and Hammond found that asbestos and smoking act synergistically in causing lung cancer.⁸ Although this theory is well accepted, there is still controversy over whether any asbestos exposure increases the risk of lung cancer or the risk is increased only when exposure is sufficient to cause asbestosis and/or only when asbestosis is present.

Other malignancies related to asbestos exposure

Although mesothelioma and lung cancer are the two major malignancies that have been linked to asbestos, many studies of asbestos workers in both Europe and North America during the past two decades suggested that some non-thoracic cancers might also result from asbestos exposure. These cancers are oral and nasopharyngeal cancers,⁹ laryngeal carcinoma,¹⁰ esophageal cancer,¹¹ gastric carcinoma,¹² colorectal carcinoma,¹³ and lymphoid malignancies.¹⁴⁻¹⁷ However, a critical skepticism of claims of a disease association is warranted at this time because concrete support, such as experimental observations and well-controlled clinical studies are lacking, and no clear distinction can be made between association and causation.

The Mechanisms of Asbestos Carcinogenesis

The mechanisms of asbestos carcinogenicity are not fully understood. Since there is a long latency between asbestos exposure and the diagnosis of cancer, many pathogenetic events may occur during this period that can contribute to tumor development.

Among the different types of asbestos fibers, crocidolite is considered the most oncogenic type. Whether chrysotile causes MM and lung cancer is still controversial. Some scientists suggested that

chrysotile does not cause cancer and it is the amphibole that often contaminates chrysotile that causes MM.¹⁸ It was found that chrysotile is considerably less biopersistent than amphibole asbestos once inhaled in the lungs.¹⁹ Some scientists proposed that chrysotile may cause MM but at a lower rate compared to amphibole asbestos.²⁰ However, there are also some scientists that think that chrysotile plays an important role in the pathogenesis of MM.²¹

The long and thin fibers (especially $\geq 8 \mu\text{m}$ in length $\leq 0.25 \mu\text{m}$ in width) are thought to be more dangerous, because they have longer biopersistence in the pleura. These fibers are able to penetrate the lung and cause repeated damage, tissue repair and local inflammation. In fact, many studies suggested that chronic stimulation of the immune system by asbestos fibers caused malignancy.

The authors found that some cytokines, especially tumor necrosis factor-alpha (TNF- α) play a critical role in asbestos carcinogenesis.²² In tissue culture, crocidolite is very cytotoxic to human mesothelial cells (HM), causing extensive cell death. *In vivo* studies have revealed that, following asbestos exposure there is an inflammatory reaction with a large component of mononuclear phagocytes.²³ Upon differentiation into macrophages, these cells phagocytize asbestos and, in response, release TNF- α . At the same time, asbestos also induces HM to secrete TNF- α , with paracrine and autocrine effects. TNF- α binds to its receptor and activates the NF- κB pathway, which increases the percentage of HM that survive asbestos exposure. HM exposed to asbestos can accumulate DNA damages. This allows HM with asbestos-induced DNA damage to divide rather than die and, if key genetic alterations accumulate, to eventually develop into a MM.²²

Besides the NF- κB pathway, some other cell signaling pathways such as the extracellular signal regulated kinase (ERK1/2) pathway was also found to be important in the oncogenicity of asbestos. Crocidolite fibers can induce autophosphorylation of the epidermal growth factor receptor, activating ERK1/2, which in turn increases activator protein (AP)-1 activity and mitosis of mesothelial cells.²⁴

Recently, it was found that asbestos and simian virus 40 (SV40) are co-carcinogens in inducing mesothelioma.²⁵ SV40 is a DNA monkey virus that contaminated polio vaccines produced between 1955 and 1978 and it has been associated with MM.^{26,27} The molecular studies showed that asbestos and SV40 in combination had a co-stimulatory effect in inducing ERK1/2 phosphorylation and AP-1 activity, which stimulated the expression and activation of matrix metalloproteinases MMP-1 and MMP-9 that led to cell

invasion.²⁵ This new discovery opened a completely novel research field – virus and mineral fiber can interact synergistically in causing cancer. Moreover, these data suggest that lower amounts of asbestos may be sufficient to cause malignancy in individuals infected with SV40. These results are important for determining levels of asbestos exposure that are supposedly “safe”. Such levels may not be truly safe for the millions of individuals who were exposed to SV40 contaminated polio vaccines. In fact, during these years, the so-called “safe” level of asbestos exposure used by the “Occupational Exposure Standards in the United States” has changed dramatically – from the initially accepted 5 mpcf (million particles per cubic foot) which is equivalent to approximately 30 f/mL in 1938 to today’s 0.1 f/mL OSHA (Occupational Safety and Health Administration) standards.

Conclusion

In 1987, the International Agency for Research on Cancer (IARC) designated asbestos as a group I (definite) carcinogen for humans. Because it had been extensively used before the 1970s and it is expensive and difficult to remove, exposure continues to this day. Moreover, although the use of crocidolite and amosite asbestos was banned in many European and North American countries since the 1990s, chrysotile asbestos is still mined and produced in certain countries, such as Russia, China and Canada. Consequently, the asbestos related environmental problem is a big concern. The prognosis of asbestos induced malignancies, especially MM, is poor, unless the disease is detected early. Therefore, finding biomarkers for the potential screening of high-risk asbestos exposed cohorts is one of the major directions of our research. In the meantime, it is hoped that by studying the mechanisms of asbestos carcinogenesis, scientists will have a greater understanding of the biological pathways involved in tumor development, which will eventually lead to novel preventive and therapeutic strategies.

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For more information on the Cancer Research Center of Hawai‘i, visit www.crch.org.

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THE WEATHERVANE

RUSSELL T. STODD MD, CONTRIBUTING EDITOR

❖ MEMO TO BIG DAN INOUE: SAVE OUR SINKING SHIP!

Faced with the same problems that we have in Hawai'i with loss of physicians due to high cost of living, and poor reimbursement, Alaska's Senators Ted Stevens and Lisa Murkowski pushed through a permanent increase to the work component of the Medicare Geographic Cost Index beginning January 1, 2009. The vote was 69 in favor to 30 opposed. Stevens said, "Medicare has only been paying about 40% of the cost for Alaska seniors. For years they have struggled to get access to health care because these Medicare payments were insufficient. Those days should be over now with the provision I secured in this bill which will raise physicians reimbursement by 35%." Perhaps someone will rouse our octogenarian senators to provide a similar dispensation for Hawai'i's seniors and we can turn around Hawai'i's physician drain.

❖ EVERY SUICIDE IS A SOLUTION TO A PROBLEM.

By a margin of 59% in favor with 41% opposed, voters in the state of Washington passed Initiative 1000 which will allow physician-assisted-suicide (PAS). Oregon voters passed the first such law in 1994 and until this election, remained the only state to permit doctors to provide patients with a lethal dose. Similar detailed guiding provisions exist in both laws which would only effect patients expected to die within six months. So-called "death with dignity" laws have previously failed in California, Michigan and Maine. The Washington measure was pushed by former Democratic Governor Booth Gardner (he has Parkinson's Disease) and supporters raised \$4.9 million for the campaign while the opposition spent \$1.9 million. Since the law was passed in Oregon 341 patients have chosen to exercise their right to commit suicide.

❖ A WILLINGNESS TO CHEAT WHEN IT LOOKS LIKE YOU'RE NOT CHEATING IS A QUIRK OF HUMAN NATURE. (KAREEM A. JABBAR)

Last year in Texas a judge bravely exposed the great silicosis scam where doctors were being paid large fees to make fraudulent reports of lung damage. Now a similar episode is unfolding in Michigan where Dr. Michael Kelly provided a diagnosis of asbestos lung disease in 7,323 patients over a 15 year period. Never mind that the doctor is neither a pulmonologist nor a radiologist, and in 1989 he failed the federal test that certifies doctors to read x-rays for lung disease. He received \$500 per patient from lawyers filing a claim, but made the mistake of sending his patients to a hospital for x-rays. When defendants checked the medical records, 88% of the 1,875 films reviewed by hospital radiologists, showed no evidence of disease when viewed by the hospital doctors. The Michigan judge preparing to hear 91 asbestos cases in which up to 90% could be fraudulent, agreed to a hearing on Dr. Kelly. Within one day of the judge's decision, plaintiff's lawyers voluntarily withdrew from all but one case. Obviously, they did not want their gravy train "doctor" exposed to judicial scrutiny. Hereafter it will be difficult for Dr. Kelly to stay under the radar.

❖ AGRI-BUSINESS OPPORTUNITIES ARE GROWING ON MAUI.

Maui medical marijuana entrepreneur Brian Murphy was arrested along with six associates in Makawao, Haiku, and Wailuku. All were charged with criminal conspiracy and various felony drug charges. The arrests were a culmination of a two year police investigation in which prosecutors claim Murphy ran an organized crime ring including hiring people to provide protection. Police seized 335 marijuana plants, 2300 grams of processed and 4,830 grams of unprocessed marijuana, 32grams of hashish, 100 marijuana candies and \$14,085 in cash. Murphy used his own medical marijuana registration to open a business, Patients Without Time. Police allege that Murphy's diagnosis was merely a front to disguise sale and distribution of marijuana for profit. The law provides that patients diagnosed with a debilitating medical condition can use marijuana for medical purposes with physician certification. The statute permits a patient to maintain three mature plants, four immature ones, and one ounce of marijuana for each mature plant.

❖ A PICTURE USED TO BE WORTH A THOUSAND WORDS WITH MRI AND CT THE VALUE JUMPED.

If you wonder where the big money goes in medical expenses, check on imaging. A ten year study of a large managed-care plan researched at the University of California San Francisco, showed that CT scans have doubled in the last 10 years while MRI scans have tripled. According to the Government Accountability Office, Medicare spending on medical imaging doubled to \$14 billion a year between 2000 and 2006. The result is that big insurers, Cigna Corp., Aetna Inc., and WellPoint Inc., have hired what

they term radiology-benefit managers (RBMs) to ensure that patients will benefit from the use of high-tech scans. The insurers often require doctors to obtain permission before approval for the scan, and even then a denial may occur, making the patient financially responsible or do without the test. Then who becomes responsible for a missed diagnosis?

❖ IF A THING IS WORTH DOING, IT IS WORTH DOING BADLY.

It appeared to be a humorous contrived story on the television program Boston Legal when a woman rancher was taken to court by the US Department of Agriculture (USDA) because she was testing all her cattle for mad-cow disease. The USDA, which tests only a small percentage, overruled the rancher and won (on TV), stating her action would force larger meat companies to follow suit. The script could have been written out of the courtroom because Creekstone Farms Premium Beef of Arkansas City, Kansas, wants to test all of its cows, but the government won't allow it. A lower court ruling would have cleared the way for Creekstone Farms, but U.S. Court of Appeals for District of Columbia overturned that ruling, stating the test is within the scope of USDA authority. Evidently, the USDA wants to protect us from mad-cow disease, but only a little bit.

❖ IN SCANDINAVIA, SMOKING GENTLEMEN PREFER BLENDS.

Women get heart disease much later than men. A Norwegian study reported at the European Society of Cardiology found that on average a non-smoking man gets the first heart attack at age 72 while a non-smoking woman suffers the first attack at age 81. Smoking females were found to have their first heart attack fourteen years ahead of non-smokers at age 67. Smoking males cut the age of longevity for the first attack to age 64, a loss of eight years. In either case it's hard to comprehend smokers refusal to stop considering the add-ons of foul breath, holes in clothing, stinking automobiles, and often being treated as a family and societal pariah.

❖ NOW THERE IS MORE TIME TO RESET THE CLOT.

Tissue plasminogen activator (tPA), is a powerful drug that can dissolve clots that lodge in the brain which can produce a major stroke. Previous medical dogma held that it must be administered within three hours of the onset of a stroke. After that, theoretically, the bulk of the brain damage is done and adding tPA could risk internal bleeding, making matters worse. A new European study published in the New England Journal of Medicine (NEJM) extends the window of tPA effectiveness by ninety minutes to 4 1/2 hours. This is a truly valuable study which could benefit tens of thousands of patients in the United States each year.

❖ MODERN DANCE HAS DEVELOPED BY LEAPS AND BOUNDS.

A man was sitting in a Pompano Beach, Florida strip club when one of the dancers kicked off her shoe. The shoe struck a mirror overhead and glass fragments rained down on the customer. His lawyer claims that he suffered a cut on his brow and a nosebleed, and that he now has headaches. He brought a law suit against the club asking for \$15,000 damages stating that the club "failed in its duty when its employee failed to perform her routine in a safe manner." The club has offered a settlement of \$1,000 but only if the plaintiff agrees to allow a large smelly man to stuff the money into his shorts one dollar at a time.

❖ USE CAUTION MOVING FROM AMTRAK TO FOOT TREK.

In Connecticut, a commuter downed five margaritas, then boarded the wrong train. When he realized his mistake he jumped off, injuring his ankle. He sued Amtrak for not taking sufficient steps to prevent an intoxicated person from getting on the wrong train and then jumping off.

❖ IT CAN BE DANGEROUS TO WRITE LEGIBLY.

Four teenagers enjoyed a restaurant dinner in Bismark, North Dakota, then dashed off leaving a \$77 bill. It wasn't too hard for police to track them down because one of the girls had filled out a comment card including her signature.

ADDENDA

- ❖ Due to high demand for blue-eyed offspring, Danish sperm bank Cyros International exports to more than sixty countries resulting in about 1,000 pregnancies per year.
- ❖ Fashion designer Miguel Caballero has produced a bulletproof polo shirt which will withstand a bullet from a nine millimeter revolver. Cost is listed at \$7500.
- ❖ Don't meddle in the affairs of cats. They are subtle and will piss on your computer.

ALOHA AND KEEP THE FAITH — rts■

Editorial comment is strictly that of the writer.

UPCOMING CME EVENTS

Interested in having your upcoming CME Conference listed? Please contact Nathalie George at (808) 536-7702 x103 for information.

Date	Specialty	Sponsor	Location	Meeting Topic	Contact
March 2009					
3/11-3/14	ID, IM PCP, ER	Staph Institute	Hilton Hawaiian Village, Honolulu	Staphylococcal Symposium	Alan Tice MD Infections Limited Hawai'i Tel: (808) 373-3488 or (808) 544-2852 Email: alantice@idlinks.com Web: www.staph2009.com
3/15-3/20	GE, R, U	Society of Gastrointestinal Radiologists, Society of Uroradiologists	Grand Wailea Resort, Wailea, Maui	2009 Abdominal Radiology Course	Web: www.sqr.org
3/23-3/27	R	Stanford University School of Medicine	Fairmont Kea Lani, Maui	17th Annual Diagnostic Imaging Update	Tel: (888) 556-2230 Email: radiologycme@med.stanford.edu Web: radiologycme.stanford.edu/2009maui/
April 2009					
4/5-4/10	IM, FM	University of California San Francisco School of Medicine	Wailea Beach Marriott, Wailea, Maui	Primary Care Medicine: Update 2009	Tel: (415) 476-4251 Web: www.cme.ucsf.edu/cme
4/6-4/10	IM, FM	Scripps Clinic	Hapuna Beach Prince Hotel	14th Annual Primary Care in Paradise	Tel: (858) 587-4404 Web: www.scripps.org/conferenceservices
4/13-4/17	Multi	The Permanente Federation	Hyatt Regency Kaanapali, Maui	Kaiser Permanente National Primary Care	Email: cmxtravel@cmxtravel.com Web: www.kpprimarycareconference.org
4/14-4/16	Multi	State of Hawai'i Department of Health, Adult Mental Health Division	Hawai'i Convention Center, Honolulu	6th Annual Best Practices Conference: Responsibility and Recovery in the Legal System	Tel: (808) 586-4686
4/18-4/24	R	International Society for Magnetic Resonance in Medicine	Hawai'i Convention Center, Honolulu	17th Annual Meeting	Web: www.ismrm.org
May 2009					
5/16-5/17	OBG	Department of Obstetrics, Gynecology and Women's Health, John A. Burns School of Medicine and Ian Donald Interuniversity School of Medical Ultrasound Hawai'i	Ala Moana Hotel, Honolulu	Contemporary OB/GYN Ultrasound: Recent Advances and Clinical Practice	Tel: (808) 203-6563 Email: treevesman@ucera.org
July 2009					
7/27-7/30	R	Stanford Radiology	Hyatt Regency Maui, Ka'anapali Beach, Maui	3rd Annual LAVA: Latest Advances in interVentionAl Techniques	Tel: (888) 556-2230 Email: radiologycme@med.stanford.edu Web: radiologycme.stanford.edu/dest/
October 2009					
10/20-10/24	Multi	American Society of Human Genetics	TBA	2009 Annual Meeting	Web: www.faseb.org/genetics/ashg
10/27-11/1	CHP	American Academy of Child and Adolescent Psychiatry	Hilton Hawaiian Village, Honolulu	56th Annual Meeting	Tel: (202) 966-2891

Classified Notices For more information call Drake Chinen (808) 383-6627.

LOCUM TENENS

SIX-MONTH LOCUM TENENS BEGINNING MID-FEBRUARY. Manakai O Malama Integrative Healthcare Group and Rehabilitation Center is seeking a part-time locum tenens for six months while its Family Medicine physician is on maternity leave. There is an opportunity for the locum tenens physician to continue and expand to full-time after our permanent staff member returns from maternity. Applications will also be accepted from providers with training in Internal Medicine, Psychiatry and General Practice. **Contact: Ira D. Zunin MD, MPH; Medical Director. Phone: (808) 535-5555; Fax: (808) 535-5556; www.manakaomalama.com.**

EXAMINATION TABLE, GYNECOLOGICAL

TILTING BACKREST, STIRRUPS, PULL-OUT TRAY, ELECTRIC OUTLET. Reasonable shape with some upholstery blemishes. (Pictures can be emailed on request.) Free to an HMA member. **230-3525 (Oahu). Dr.dakine@hawaiiantel.net.**

HMJ (Instructions to Authors)

Manuscripts

Submit scientific articles, essays, letters and other manuscripts to *Hawai'i Medical Journal*, c/o Drake Chinen, 95-1027 Ainamakua Dr. #114, Mililani, HI 96789.

Ph: (808) 383-6627. email: drakechinen@gmail.com

Manuscripts are reviewed by the editors, the peer review panel, and other experts in the particular specialties. Please be aware that your article will be edited to comply with the AMA style, corrected for grammar, and recommendations could be made by the peer reviewers.

- Please submit 3 copies on 8-1/2 x 11 paper.
It is recommended the article be submitted on a CD.
Submit only articles that have not been submitted elsewhere.
- 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.
- Number pages consecutively beginning with the title page.
- Graphs, tables and figures can be up to 7-1/2 inches in width. Do not embed tables, figures, and graphs within the text.

A cover should contain the name of the author with whom HMJ will correspond, include an address, phone number, fax number and email, along with a statement that the manuscript has been seen and approved by all authors.

Note: Keep manuscript to 3,000 words maximum.

Title and Authors' Names

Please keep the title short, specific and *catchy* if possible. If the title submitted is too long, it will be edited. List first name, middle initial and last name of each author with highest academic degrees; name of department and institution to which the work should be attributed; name and address of author to whom requests for reprints will be addressed, or statement that reprints are not available; the source of support in the form of grants, equipment, drugs, or all of these.

Abstract (see Synopsis-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.

- 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. This will enable the article to be retrieved when relevant.

Style

Use *JAMA* style or consult the *AMA Manual of Style*. 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 find-

ings. Do not use abbreviations in the title and limit their use in the text. Use human terms, i.e. "men" and "women" instead of "males" and "females." Also place a comma before "and" in a series.

Text

HMJ recommends 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 (<http://www.wma.net/elpolicy/pdf/17c.pdf>). 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 figures. 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.

Illustrations, Tables, Graphs and Figures

Tables and graphs must be prepared in Microsoft Word or Excel. Numerical data should accompany graphs. Please limit the number of illustrations, tables, graphs, and figures.

References

All references must be cited in the text and should be arranged in the order in which they are cited—not alphabetically. Please use the *JAMA* style for the references:

1. Jones J. Necrotizing *Candida* esophagitis. *JAMA*. 1982;244:2190-2191.
2. Style L. *Biochemistry*. 2nd ed. San Francisco, Calif: WH Freeman Co; 1981:559-596. [Not CA]

Footnotes

Place footnotes outside of punctuation marks. (e.g. These include diabetes,⁵ hypertension, orthopedic complications,⁶ asthma, sleep apnea,⁷ eating disorders⁸ and psychosocial problems.⁹)

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.

(See <http://hawaiimedicaljournal.org> for complete information on submissions.)

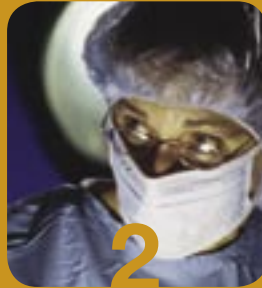


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—Mitchell B. Miller, MD, physician member of the AMA and his local and state societies