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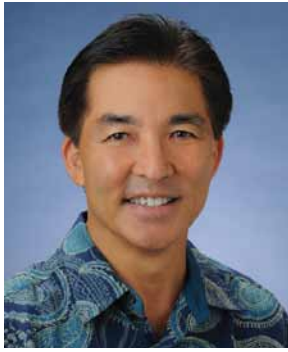
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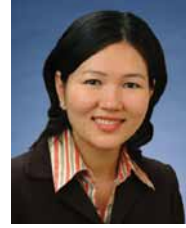
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A Case of Severe Septicemia Following Traditional Samoan Tattooing

Diane U. Elegino-Steffens MD; Clifton Layman DO; Ferdinand Bacomo MD; and Gunther Hsue MD

Abstract

Traditional Samoan tattoos, or tatau, are created by master tattooists, or tufuga ta tatau, and their assistants using multi-pointed handmade tools. These tools are used to tap tattoo pigment into the skin, usually over several days. This traditional process is considered an honor to the one receiving the tatau. Unfortunately, as it is typically practiced according to cultural traditions, the sanitary practices are less than ideal. There have been several reported cases of severe infection, sepsis, shock, and even death as a result of traditional Samoan tattoos. Although Hawai'i is the home of the second largest Samoan population in the United States, short of only American Samoa, literature review found no published case reports in this state. Presented is a case of a 46-year-old man, who, after undergoing a modified version of traditional Samoan tattooing for 5 days, was admitted to the intensive care unit with severe septic shock due to poly-microbial bacteremia with Group A Streptococcus and Methicillin-sensitive Staphylococcus Aureus. In addition, we will discuss the previously reported cases, mainly documented in New Zealand, and review some of the mandatory sanitary standards put into place there.

Keywords

Samoa; Tattoos; Tattooing, complications; Tattooing, adverse reactions; Cellulitis; Bacteremia, Group A streptococcus; Bacteremia, Methicillin-Sensitive Staphylococcus aureus

Introduction

Traditional Samoan tattooing is an ancient process in practice for over two thousand years with strong ties to its culture. The traditional tattoo is referred to as *pe'a* for men and *malu* for women. The tattoo, or *tatau*, is created by tools composed of shell, tooth and wood.¹ A *pe'a* is only done the traditional way by tapping of the tattoo pigment into the skin, usually under cultural ceremony or ritual. The design is typically geometric, covering the body from torso to knees and consisting mainly of straight lines with larger areas of solid dye. Originally, the *tatau* process took several months up to one year to complete. This process allowed the individual time to heal between sessions before continuing. Additionally, prior to each session the tools were boiled in water, which may explain the infrequency of complications arising from traditional *tatau*.¹ This process is extremely painful and even in modern times, when done in stages, can take weeks to complete; in extreme cases, tattoos may be completed over a matter of days if there are no complications and the pain is tolerable.²

There are well known descriptions of medical complications arising from tattoos in general. These complications are divided into five categories: aseptic inflammation and pyogenic infections (such as impetigo, furunculosis, and cellulitis), non-pyogenic infections (to include syphilis, leprosy, and viral hepatitis), cutaneous diseases that localize in tattoos (such as vaccinia, psoriasis, and chronic discoid lupus erythematosus), acquired sensitivity to tattoo pigments, and miscellany (ie, keloids, erythema multiforme, or lymphadenopathy).³

The most serious complications are septicemia and local gangrene from deep seeded bacterial infections that can result in death.⁴ Although rare, life-threatening complications are more prevalent with homemade tattoos. The process of traditional Samoan tattooing has changed very little over time and as a result has led to a series of case reports linking infectious complications to Samoan tattooing in New Zealand and Australia. We present a case of a young Samoan man that developed a deep skin infection leading to bacteremia and severe sepsis after 5 consecutive days of extensive Samoan tattooing.

Case Presentation

A previously healthy 46-year-old Samoan man presented to the emergency department after a pre-syncope episode and 3 days of fevers, chills, and night sweats. Along with several other Samoan men receiving tattoos, a shark's tooth was used to create a *pe'a* extending from his torso to lower extremities during the prior 5 days, each session lasting more than 5 hours. The *tatau* process was performed at the residence of a *tufuga ta tatau*. The patient noted increasing erythema, edema, and purulent exudate along several areas of the tattooed skin on his abdomen and right thigh since the third day of receiving his tattoos.

On admission, he was febrile, hypotensive, and tachycardic with subsequent decompensation requiring mechanical ventilation and vasopressor support for presumed septicemia from cellulitis. Laboratory studies revealed a profound leukocytosis (white cell count, $31.9 \times 10^9/L$), anemia (hemoglobin 9.7 g/dL, hematocrit 29.2%), mild hepatocellular injury (aspartate aminotransferase 101 units/L, alanine aminotransferase 48 units/L), acute renal failure (creatinine 1.75 mg/dL) with hyperkalemia (5.9 mmol/L), myocardial infarction from toxic-metabolic supply demand mismatch with an elevated troponin of 6.170 ng/mL, C-reactive protein 40 mg/dL, pro-calcitonin 29.28 ng/mL, and an anion gap metabolic acidosis with a lactate of 5 mmol/L. The patient's nares were positive for Methicillin Resistant *Staphylococcus Aureus* (MRSA) colonization.

He was empirically treated with intravenous Vancomycin, Piperacillin-Tazobactam, and Levofloxacin to cover for MRSA, other gram positive organisms present in skin flora, as well as gram negative and anaerobic organisms that could be introduced by unsanitary practices. On day 2 of hospitalization, blood cultures grew Methicillin-Sensitive *Staphylococcus Aureus* (MSSA) and Group A Streptococcus, prompting a change in his antibiotic regimen to intravenous Nafcillin and Clindamycin. Magnetic resonance imaging was performed because of concern for necrotizing fasciitis of his lower extremities and the findings were concerning for potential necrotizing extension

of his skin and soft tissue infection. Surgical consultation was obtained and, after examination, it was felt the patient did not have clinical evidence to support a diagnosis of necrotizing fasciitis. He was stabilized over the course of 72 hours in the medical intensive care unit with aggressive fluid resuscitation, intravenous antibiotics, vasopressor, and inotropic support. The hospital course was complicated by the development of multiple subcutaneous abscesses in his left lower extremity requiring surgical drainage and wound debridement. He was transferred to an acute care rehabilitation center on hospital day 18 to complete a 4-week antibiotic course.

Discussion

Tattoos are permanent imprints on the skin created by deposition of ink into the dermis through a series of punctures using a sharp object.⁵ The art of tattooing has been in practice for hundreds of years by many cultures across each continent that can be dated back to 4000 B.C. The English term tattoo has its origins from the Polynesian language and is thought to be most directly derived from the Samoan word *tatau*.²

Samoa is an archipelago in the South Pacific roughly halfway between Hawai'i and New Zealand. The Samoan natives are steeped in custom and have been practicing the art of tattooing since 1500 B.C.⁶ These creations are more than symbols of beautification as they signify respect for a man's courage and transition through manhood — a symbol of high social status and a prerequisite to receiving a Chief title. Despite early missionary attempts to outlaw this practice, the tradition has thrived in Polynesia and continues today as it was in the past.²

When a needle pierces the outer layer of the skin, the dye is carried along the surface through the wound tract in the upper and middle aspects of the dermis.⁷ An inflammatory process is stimulated causing superficial epidermal sloughing and influx of inflammatory cells, exposing the basilar layers. In the dermis, most of the pigments aggregate within the papillary and reticular layer. Eventually, there is gradual assimilation of the pigment into macrophages. The majority of these macrophages migrate to regional lymph nodes, while the remaining population forms the permanent tattoo.⁴

The most common adverse effect from tattooing is a local bacterial infection, occasionally severe enough to cause necrosis, amputation, or even death.⁴ This was reported as early as the 19th century among French sailors receiving tattoos. Such complications were not surprising given the general lack of sterility, use of contaminated needles, and application of substances such as urine or saliva during the tattoo process. Today, these complications are rare in the professional tattoo community with the adoption of sterilization, standardization of equipment, and the availability of antibiotics in the event of a cutaneous infection.³

With the emigration of Samoans throughout the Pacific basin, traditional tattooing has followed. These tattoos are a popular means of connecting to their homeland and its heritage. The sense of pride in receiving a tattoo in the traditional manner may lead to acceptance of poor antiseptic techniques involved

in the *tatau* process.⁸ A strong desire to preserve this traditional process has frequently discouraged young Samoan men from using antibiotics or painkillers during the *tatau* process.⁹ Unlike Western tattooing techniques that only penetrate through the upper layers of the skin, tapping of the instrument in Samoan tradition requires some force. This primitive technique usually drives the teeth of the instrument through several layers of skin causing more injury and exposure to the outside environment.

Surprisingly, there are only a few reported cases of life-threatening complications linked to traditional tattooing. The earliest report was documented by Korman of Australia in 1994.¹⁰ The traditional technique involved use of a sharpened boar's teeth and application of paste consisting of kerosene and turmeric over the tattooed areas of a Samoan male. After developing thigh inflammation, the man presented one week later with acute illness and was found to have polymicrobial septicemia with *Pseudomonas aeruginosa* and *Streptococcus pyogenes*.

In Auckland, New Zealand there has been a resurgence of traditional tattooing performed by resident *tufuga ta tatau*. In 2003, Porter, et al, described two cases of necrotizing fasciitis and cellulitis, one resulting in death, following traditional tattooing.¹¹ An investigation of the two cases had similar causal themes to include improper sanitary conditions and late presentation of infectious complications because of unwillingness to access medical services as an expectation of tradition and a misunderstanding of the presenting symptoms.

Two additional cases in New Zealand were reported by McLean et al in 2010.¹² The first suffered from extensive cellulitis and necrosis with wound cultures identifying *Staphylococcus aureus* and Group C *Streptococcus*. The other involved severe septic shock and multi-organ failure from necrotizing fasciitis with abdominal wound cultures demonstrating Group A *Streptococcus* and *Pseudomonas aeruginosa*. Both men were immune to Hepatitis B. Further investigation through survey of regional general practitioners and emergency departments revealed eight additional cases of cellulitis with varying degrees of severity. Five of these cases were linked to the same tattooist who was known as an experienced traditional Samoan practitioner that worked from his garage. Microbiology testing performed on his tools isolated the same strain of Group A streptococcus identified in the latter case. This tattooist voluntarily ceased practice and eventually resumed practice once he was able to demonstrate adequate infection control procedures to an infectious disease specialist.¹²

There are only two other recent cases identified in the literature relating to complications of Samoan tattoos, both published in New Zealand. These are unique cases linking traditional tattoos to Diphtheria,¹³ an acute bacterial illness caused by toxigenic strains of *Corynebacterium diphtheria*, and Sporotrichosis,¹⁴ a fungal infection caused by the dimorphic organism *Sporothrix schenckii*. Although Hawai'i is the home of the largest Samoan population in the United States, our literature review revealed no published case reports in this state. Similar to the published cases we have just reviewed, the *tatau* process in our case was performed at the private residence of a local *tufuga ta tatau*. It is likely that bacterial pathogens were introduced through



Figure 1. Extensive Samoan tattooing over the right trunk and thigh. The heavy pigmentation can make diagnosis of cellulitis difficult.

use of non-sterile instruments or improper sanitary techniques.

Given the resurgence of traditional tattoos in New Zealand and the series of related pyogenic infections, bylaws have been formulated by the Manukau City Council to specifically address these issues.¹⁵ These bylaws have been amended to include

standards for cultural tattoo artists that aim to prevent transmission of diseases. According to these regulations, a *tufuga tatau* is required to obtain a permit to practice and demonstrate proper sanitation techniques before, during and after tattooing. In the state of Hawai'i, the Department of Health has set forth



Figure 2. Mottled erythema over the tattoo of the left thigh.

minimum requirements for the safety and protection of public health.¹⁶ However, the licensing and sanitation requirements do not apply to culturally significant tattooing practices.

Conclusions

Traditional Samoan tattooing has been in existence for thousands of years, and remains in common practice today. There are inherent dangers with the traditional *tatau* techniques, mostly as a result of poor sanitation practices that have occasionally lead to serious medical complications, particularly in the modified traditional process practiced today where the *pe'as* are completed in as little as 5 days to a week. In the literature review, patients present late in the course of their infectious process due to a strong desire to adhere to traditional practice without medical interference. In our case, the patient thought that his initial manifestations (erythema, induration, fevers, and even purulence) were typical inflammation for someone undergoing the *tatau* process. He did not seek medical care until he had systemic complications including pre-syncope and severe fatigue. This minimization of symptoms, in addition to the polymicrobial bacteremia, led to a complicated and difficult hospital course for the patient, who eventually recovered.

In addressing this public health risk, future priorities should focus on teaching of proper sanitary techniques to local *tufuga ta tatau* in conjunction with regulated adherence to these standards as have been established in New Zealand. However, the medical community should take caution in its approach to address the sanitation standards in order to balance the health concerns with cultural sensitivities and what may be interpreted as interference with a Samoan rite of passage. The incidence of this case, in conjunction with the documented complications in New Zealand, should provide the gateway for primary care manager (PCM) and patient discussion when a patient is going to get a tattoo. It is prudent on the part of the PCM to take thorough social history, to tease out the social roots of a patient and to ask about any cultural practices that a patient may plan to pursue. If a patient endorses desire or intent to have a tattoo, particularly a traditional style tattoo, then a PCM should take liberty to inform the patient of proper sanitation methods that the *tufuga ta tatau* should follow, and the Hawaiian medical community should strive to encourage our patients to seek medical treatment when they experience complications from the *tatau* process despite the cultural stigma that maybe associated with seeking help, as well as educating the patient population about the signs and symptoms of complications.

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.

Conflict of Interest

None of the authors identify any conflict of interest. The authors have no financial interest in this paper. No financial support was provided for this paper.

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Primary Hyperparathyroidism Mimicking Hyperemesis Gravidarum

Brian C. Benson MD; Roy E. Guinto DO; and Jonathan R. Parks MD

Abstract

Nausea and vomiting are common complaints during pregnancy. Their severity and persistence can lead to the diagnosis of hyperemesis gravidarum, which is associated with weight loss, ketonuria, and decreased fetal birth weight. Hypercalcemia in pregnancy can confound these common gastrointestinal symptoms as well as have its own intrinsic maternal-fetal risks. A 23-year-old woman was diagnosed with primary hyperparathyroidism after multiple visits to the emergency department and the obstetrical clinic with symptoms of nausea and vomiting. Her symptoms were initially attributed to hyperemesis gravidarum and only after multiple hospital visits was her hypercalcemia discovered. Her workup led to the diagnosis of primary hyperparathyroidism caused by a solitary parathyroid adenoma. The patient was treated conservatively with intravenous fluids and eventually surgical resection of the parathyroid adenoma which led to complete resolution of her symptoms. This case demonstrates the diagnostic and therapeutic challenges associated with hyperparathyroidism in pregnancy.

Introduction

Hypercalcemia affects several organ systems and patients typically present with multiple complaints including anorexia, nausea, constipation, polydipsia, polyuria, nephrolithiasis, bone pain, weakness, fatigue, and neuropsychiatric disturbances. Untreated hypercalcemia during pregnancy can lead to complications such as spontaneous abortion, still birth, neonatal death, or neonatal tetany.¹ Although the differential diagnosis for hypercalcemia is limited, the most common cause in the outpatient population is hyperparathyroidism.² The treatment is based on the severity of the disease determined by both symptoms and serum calcium levels. In patients with hyperparathyroidism, increased serum calcium levels have been shown to correlate with increased symptoms of hypercalcemia.³ This correlation has also been found to hold true in pregnant patients with hyperparathyroidism and therefore both serum calcium levels and symptom severity are considered in the management of the patient.

Primary hyperparathyroidism is treated similarly in pregnant and non-pregnant patients using medical and surgical therapies. An additional consideration in treatment of the pregnant patient is prevention of harm to the fetus. Medical treatments of hyperparathyroidism include intravenous fluids, correction of electrolytes as well as pharmacologic treatments including bisphosphonates, calcimimetics, and vitamin D analogues.⁴ Due to the rarity of hypercalcemia in pregnancy and ethical considerations in studying drugs in pregnant patients, these medications have been classified as pregnancy category C and have not been well-studied; their safety in pregnancy is based on limited numbers of case reports, precluding them from routine use. Surgery should be considered because parathyroidectomy is the definitive treatment and can be safely performed in the second trimester of pregnancy.⁵

Case Report

A 23-year-old Caucasian woman at 15 weeks gestation presented to the emergency department with nausea, vomiting, and 15 pounds weight loss. She had been treated for similar symptoms for the previous six weeks with a trial of antiemetics and intravenous fluids with minimal relief of her symptoms. On presentation, she also noted worsening lightheadedness, diffuse abdominal pain, and was admitted to the hospital due to her inability to tolerate oral fluids. Admission lab tests were significant only for an elevated calcium level of 12.8mg/dL (reference range 8.8-10.2mg/dL). Her past medical history included nephrolithiasis as a teenager. She had no family history of hypercalcemia. She was not taking any medications except antiemetics and prenatal vitamins. Her vital signs were unremarkable and her abdominal exam showed a gravid uterus and diffuse tenderness to palpation without peritoneal signs.

Additional workup revealed an ionized calcium of 1.6 mmol/L (reference range 1.1-1.3 mmol/L), albumin of 5.1 g/dL (reference range 3.7-5.5 g/dL), phosphorus of 1.4mg/dL (reference range 2.7-4.5 mg/dL), 25-OH vitamin D of 22 ng/mL (reference range 30-100 ng/mL), and 1.25-OH vitamin D of 82pg/mL (reference range 18-72 pg/mL). Parathyroid hormone (PTH) was 78 pg/mL (reference range 18-72 pg/mL). PTH-related peptide was 13 pg/mL (reference range 14-27 pg/mL), TSH and FT4 were within normal limits. She was diagnosed biochemically with primary hyperparathyroidism and treated with aggressive intravenous hydration, which lowered her calcium to 10.7mg/dL. She had a dramatic initial response to treatment with resolution of her symptoms; however, after discharge she had recurrent daily vomiting and struggled to maintain adequate hydration.

A parathyroid ultrasound was performed which revealed a 4x3x2mm hypoechoic focus in her right inferior thyroid pole consistent with a parathyroid adenoma (Figure 1). At 25 weeks gestation, she underwent a right parathyroidectomy with intraoperative PTH level monitoring. A 300 mg parathyroid adenoma was resected with a subsequent drop in PTH levels suggesting cure of her disease. She was discharged with daily calcium supplementation after complete resolution of her nausea and hyperemesis. Her calcium level at 3 week post-operative follow-up was normal and her symptoms had not returned. She had an uncomplicated delivery and surveillance calcium levels have been within normal limits.

Discussion

Nausea and vomiting of pregnancy (NVP) is common, affecting up to 80% of pregnancies. The onset of symptoms typically begins around 4 to 5 weeks of gestation and improves by week



Figure 1. Thyroid ultrasound: 4x3x2mm hypoechoic focus consistent with a parathyroid adenoma.

12, but can persist longer. A minority of these women, 0.3% to 1.5%, will have a severe form of NVP called hyperemesis gravidarum.⁶ This is a spectrum of disease manifested by these commonly accepted criteria: persistent vomiting, weight loss exceeding 5% of pre-pregnancy body weight, and ketonuria unrelated to other causes.⁷ This patient met the criteria for hyperemesis gravidarum due to persistent vomiting associated with weight loss and ketonuria.

The differential diagnosis for the non-specific complaint of nausea and vomiting is broad and makes a complete evaluation lengthy. In the pregnant woman, evaluation and diagnosis is targeted to disease severity and exclusion of other causes. It includes measurement of weight, blood pressure, heart rate, electrolytes, serum ketones, and urinalysis. Routine obstetrical ultrasound can exclude multiple gestation and hydatidiform mole which are both associated with increased incidence of hyperemesis. Although calcium levels are not part of the general evaluation, it is a selective test that can be considered on a patient-specific basis.

An elevated calcium level is particularly notable because total calcium levels are normally lower during pregnancy due to the increased calcium demands of fetal growth.⁸ Primary hyperparathyroidism is a rare complication of pregnancy, occurring in 0.5%-1.4% of all cases.⁹ It is the most common cause

of hypercalcemia and further testing of serum PTH is indicated in cases of hypercalcemia in pregnancy. PTH is unaffected by pregnancy and a normal or elevated PTH level in the setting of hypercalcemia is diagnostic of primary hyperparathyroidism.¹⁰ Ionized calcium levels are unchanged by pregnancy and are also helpful to rule out a pseudohypercalcemia. Vitamin D levels (25-hydroxyvitamin D and 1,25-dihydroxyvitamin D) should also be measured to evaluate for vitamin D intoxication or granulomatous disease such as sarcoidosis. Malignancy as a cause of hypercalcemia should be explored, as well as contributing factors such as acute renal failure, immobilization, or other endocrinopathies as clinically indicated.

Medical treatments of hyperparathyroidism include intravenous fluids and correction of electrolyte abnormalities which are initial treatments and safe in pregnancy. Calcitonin, pregnancy category C, does not cross the placenta and has been used safely in pregnancy to suppress bone resorption and promote urine calcium excretion.¹¹ Oral phosphate, pregnancy category C, is used to bind calcium but has not been well studied. Bisphosphonates, pregnancy category C, cross the placenta and may interfere with endochondral bone development.¹² Cinacalcet, pregnancy category C, has been used safely in two patients.¹³ High-dose magnesium also acts on the calcium receptor to decrease PTH and serum calcium and is commonly used in

preeclampsia. Ethical concerns have limited testing of these drugs in pregnant patients and their risks remain unknown. Watchful waiting is a reasonable treatment for patients with mild, asymptomatic hypercalcemia. However, parathyroidectomy is the only definitive treatment and is recommended for symptomatic patients or those with severe hypercalcemia, generally defined as greater than 11 mg/dL. Surgery is generally only recommended in the second trimester due to the increased risks of incomplete organogenesis during the first trimester and preterm labor during the third trimester.¹⁴ Although third-trimester parathyroidectomy is associated with a reported 58% fetal mortality,¹⁵ there have been several case reports of third-trimester parathyroid surgery without complications and it may be reasonable when the benefits outweigh the risks of surgery.^{16,17} The risk of inducing premature labor increases in the third trimester; the risk of spontaneous abortion from general anesthesia is reported to be minimal, particularly in extraperitoneal surgery.¹⁸ The maternal risks of parathyroidectomy are similar to non-pregnant patients including those risks associated with general anesthesia, injury of the recurrent laryngeal nerve, and post-operative hypocalcemia.¹⁹

Conclusion

Hyperparathyroidism presenting in pregnancy can cause symptoms such as hyperemesis, gastrointestinal upset, and nephrolithiasis which may be misdiagnosed on initial presentation. Medical and surgical options are available for treatment although maternal-fetal risks should be considered prior to treatment. Surgery should be performed in the second trimester and considered in the third trimester when symptoms are refractory to medical management since the benefits of parathyroidectomy may outweigh the risks of surgery.

Disclaimer

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.

Disclosure/Conflict of Interest

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Polypharmacy Reviews Among Elderly Populations Project: Assessing Needs in Patient-Provider Communication

Alain K. Takane MPH, Mia-Danica Balignasay, Claudio R. Nigg PhD

Abstract

Adults sixty-five years of age and older are a growing population, and are the largest consumers of prescription and nonprescription medications in the United States with potentially increased medication interaction risks. Therefore, an investigation to determine if elderly populations at two minority serving, independent housing sites perceived any issues regarding their medication use, including any communication challenges with their providers. The data were collected using a survey in which participants had to recall information about their medication use and past provider interaction.

Participants (N=21; 90.5% female; using 5.1 ± 2.6 medications) completed a needs assessment. Results indicated that patients felt comfortable talking to their doctors. However, the communication that occurs may not have included education on polypharmacy. Many participants did not believe that they could describe details about their medications, such as the purpose (47.6%), instructions (42.9%), side effects (66.7%), and the possible risk of addiction (42.9%). This assessment indicates a need for an intervention that is focused on communication about polypharmacy and medication review education.

Keywords

Elderly Adults, Geriatric, Multiple Medication Use, Patient-Physician Communication, Polypharmacy

Introduction

Defining Polypharmacy

The term polypharmacy, literally meaning “many pharmacies,” has various definitions in different medical literature. Baranzini, et al, defined polypharmacy as the use of four or more medications or up to seven or more medications.¹ Michocki, Lamy, Hooper, and Richardson considered polypharmacy to be the condition in which patients receive too many medications, medications for too long, or medications in exceedingly high doses.² Bushardt, et al, concludes that there is no consensus in the medical literature for the definition of polypharmacy.³ For the purposes of this study and for medical inclusivity, polypharmacy will be defined as the use of more than one medication.

Polypharmacy as a Public Health Problem

Polypharmacy is escalating as a public health problem in the United States' health care system.³ Although, polypharmacy can be deemed appropriate when multiple drug regimens are necessary to treat more than one medical condition, it must be monitored carefully by clinicians to achieve a therapeutic goal.⁴ Polypharmacy has been shown to increase the risks of drug-drug interactions, drug-disease interactions, and inappropriate dosing.³ Due to co-morbidities associated with aging, the geriatric population is the most susceptible group of people to polypharmacy and its associated adverse health outcomes.³ Patients sixty-five years of age and older are the largest consumers of prescription and nonprescription medications in the United States.³ By 2050, the number of people 65 years of

age and older is expected to nearly double from 38.7 million in 2008 to approximately 88.5 million.⁴ With the predicted growth of the geriatric population, the occurrence of multiple chronic diseases that require concomitant management will also increase.³ Furthermore, health care physicians will face the challenge of balancing the risks and benefits that result from multiple medication use.³

Communication Barriers

Interpersonal communication plays a key role in the health behavior change process.⁵ Good communication between a patient and their physician leads to an overall improvement in physical health, chronic disease management, and a better quality of life in regards to patient health.⁵ A key aspect of good communication is a detailed medication history. Medication histories are vital in preventing prescription errors and reducing consequent risks to geriatric patients.⁶ However, patients and physicians often omit asking or informing about over-the-counter (OTC) and herbal medications because they consider them unimportant.⁷⁻¹⁰ These nonprescription drugs may be involved in harmful drug to drug interactions and other adverse drug effects.⁷⁻⁹ Furthermore, a good medication history includes more details than the drug name and the dosage. It should also include adverse drug reactions, hypersensitivity reactions, start and stop date for certain medicines, all OTC medications, and herbal or natural supplements.⁶

In many previous interventions and studies that have reviewed polypharmacy and its effects on the geriatric population, results have shown that polypharmacy increases the risk of negative health effects.^{1,3,4,11} However, there has been little research focused on the issues of polypharmacy within elderly minority populations in Hawai'i. The purpose of the Polypharmacy Reviews among Elderly Populations (PREP) Project: Assessing Needs in Patient-Provider communication was to determine if elderly populations at two housing sites had any issues regarding polypharmacy. The PREP project also assessed any communication challenges regarding polypharmacy in this minority, geriatric population. It was hypothesized that the results would indicate areas in need of intervention within this population.

Methods

The project was approved by the University of Hawai'i (UH) at Manoa Committee on Human Studies (CHS). Permission was granted by the housing site manager to do data collection at the elderly housing sites in 2011.

Participants

Participants were recruited for the needs assessment via flyers

that were posted throughout two independent housing sites. The housing sites are classified as Section 8 housing, and they are located in the 'Ewa District of O'ahu. These sites were selected based upon previous relationships established between the advising author and the complexes. Any interested resident was allowed to attend the event. At any given time there may be a maximum of 170 residents living at the housing complexes.

Procedures

Flyers advertised a game of Medication BINGO that residents could take part in while learning about a new study being conducted at UH Manoa. The flyers also advertised snacks and juice. Residents who attended the meeting were first informed about the project, and then asked to sign a consent form if they were interested in completing a survey. Completion of the survey was not necessary to take part in the Medication BINGO game that followed. Prizes for the Medication BINGO included a bag filled with office supplies, a plastic bowl or cup, and an energy bar. All residents who attended the meeting, regardless of whether or not they filled out the survey, were given a snack bag filled with an instant noodle soup mix, two granola bars, and a bag of cookies at the end of the event.

Measures

Participants completed a self-administered, paper survey which included questions pertaining to multiple medication use involving any prescription or over-the-counter medicines, topical agents, herbal supplements, and vitamins. Other sections of the survey included questions pertaining to knowledge on medication reviews, and communication between residents and their primary care physician. Some of the questions were taken from the Hyperpharmacotherapy Assessment Tool (HAT).³ The HAT is a tool that was designed for physician assistants to use as a guide during a drug therapy evaluation process.³ The questions in the HAT did not fit our study's purposes, and many of the items were not used. However, the HAT was used as a content reference for developing survey questions regarding multiple medication use. Content addressing the total number of medications, the use of multiple pharmacies, and a patient/caregiver's ability to describe the purpose, side effects, and instructions for all medications was taken from the HAT. Survey questions were developed to fit the Theory of Planned Behavior (TPB) model that assesses an individual's behavioral, normative, and control beliefs.

The survey was primarily designed to be answered on a three-point ("no", "not sure", "yes") and a five-point Likert scale ("Strongly Disagree" to "Strongly Agree"). Some questions were also tailored to be answered on a numerical value scale. Likert scales were utilized for questions that did not require a numerical value to allow for variance within participant responses. The data taken from the surveys were compiled and analyzed using Microsoft Excel. The data were analyzed to determine the percent of participants who responded positively to items in the survey by selecting "Strongly Agree" and "Agree". Certain survey items were reverse coded to display the highest value as positive. The survey is provided in the Appendix.

Results

Demographics of participants are presented in Table 1. Participants (N = 21) were mostly older females of various ethnicities.

Table 1. Demographics	
Characteristic	Participants (N = 21)
Age (Mean, Years)	75.4 ± 12.1
Female (%)	90.5
Male (%)	9.5
Ethnicities (%)	
Filipino	38.1
Japanese	23.8
Hawaiian	9.5
Samoan	9.5
Other ^a	19.1
Highest Level of Education (%)	
Less than High School	28.6
High School	33.3
Some College	23.8

^aOther Ethnicities include: Chinese, Caucasian, Portuguese and Puerto Rican.

Medication Use

Participants reported an average medications number of 5.1 ± 2.6, range of 10, and a median of 5.0. Figure 1 shows the percent of participants who responded "Strongly Agree" and "Agree" to questions about their medication use.

Participants strongly believed that it was not okay to take another person's medications (Figure 1). Most participants did not feel that they had difficulty keeping track of their medications or trouble taking them (Figure 1). However, Figure 1 also showcases that participants did not feel confident about their knowledge regarding their medication use. Many participants did not believe that they could describe details about their medications, such as the purpose (47.6%), instructions (42.9%), side effects (66.7%), and the possible risk of addiction (42.9%).

Figure 2 shows that most participants do not have someone helping them keep track of their medications. Most participants also responded that they do not have a printed schedule or any other tool they use to aid them in organizing their medication use. According to the data, 61.9% responded to never having had an adverse reaction from their medications. If the participant did have an adverse reaction, 9.5% said they asked their doctor about it.

Physician-Patient Communication

Participants received their care from a range of one to five physicians. There was an equal distribution (28.6% of participants) between the number of participants who reported receiving care from one or two physicians, 19.1% from three physicians, 14.3% from four physicians, and 4.8% from five physicians. The majority (90.5%) of the participants stated that they use only one pharmacy.

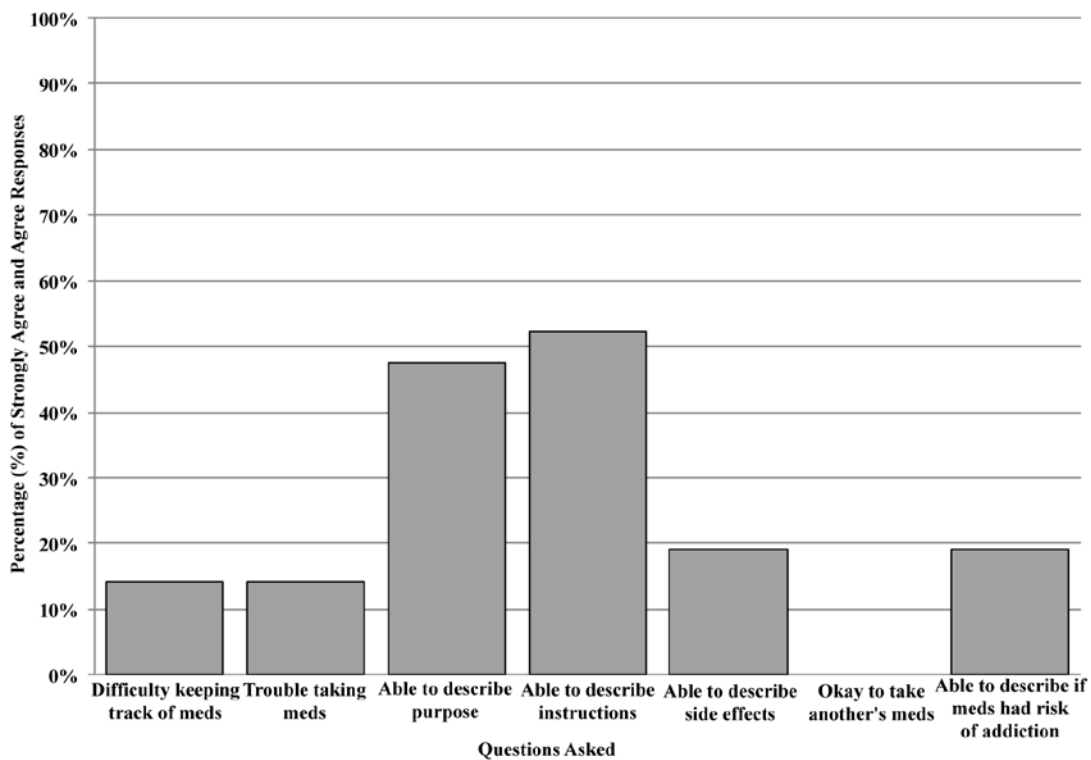


Figure 1. Current Medication Use: This figure shows the percent-positive response for the participants who selected “Strongly Agree” and “Agree” for the labels corresponding to the survey item. All participants selected “Strongly Disagree” or “Disagree” for the survey item asking, “Do you believe it’s okay to take another person’s medication?”

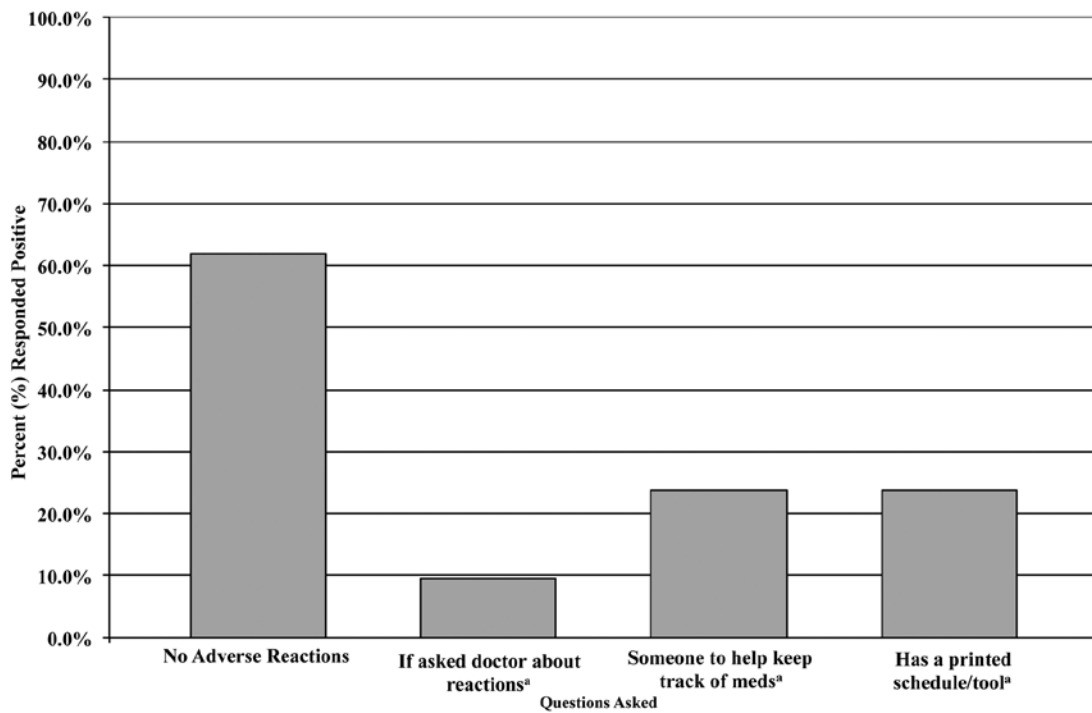


Figure 2. Medication Use Reactions & Assistance: This figure shows the percent of participants who responded positively to the label corresponding to the survey item. ^aQuestions that were reverse coded for the purpose of displaying the highest values as positive. The response “Not Sure” was not included in the analysis.

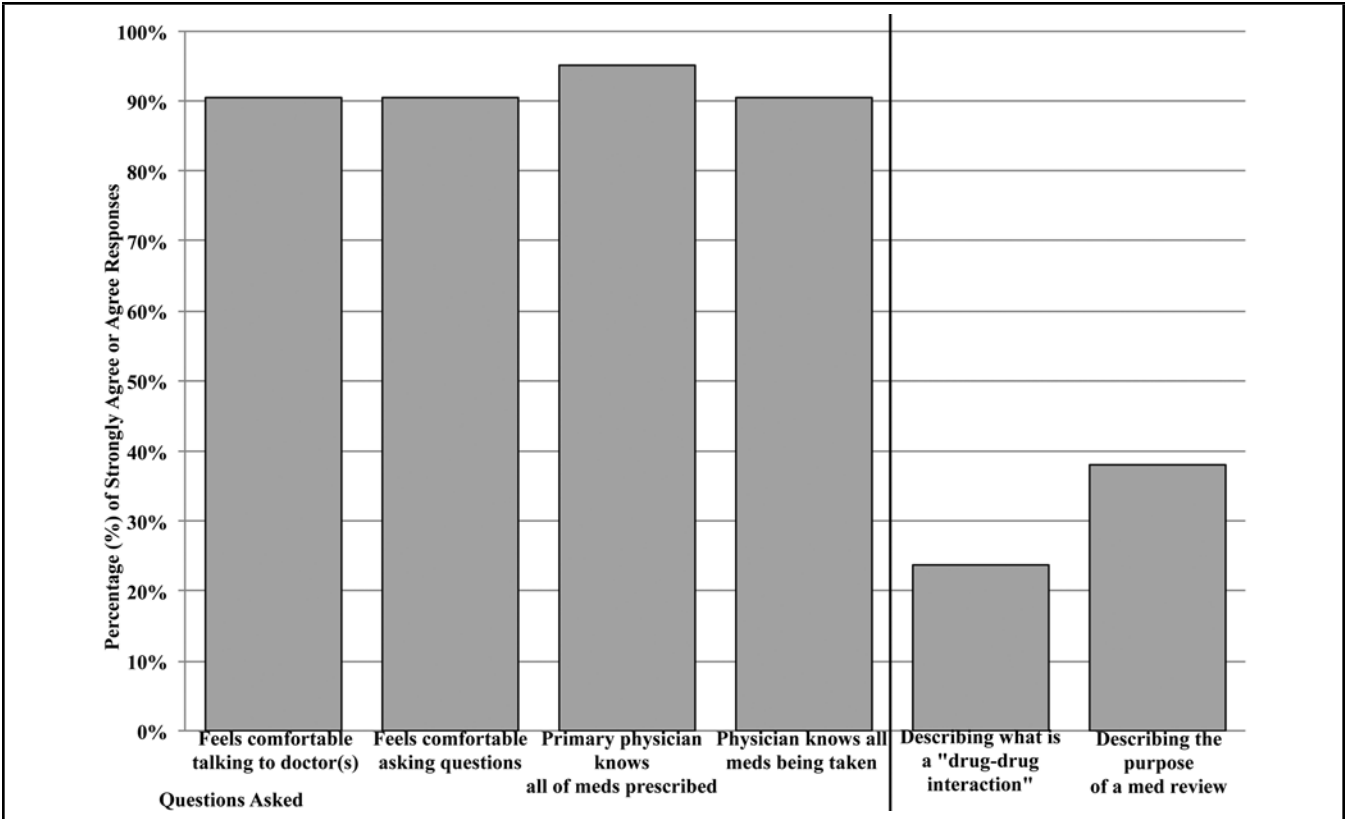


Figure 3. Physician-Patient Communication & Medication Reviews: This figure shows the percent of participants who selected "Strongly Agree" and "Agree" for the labels corresponding to the survey item.

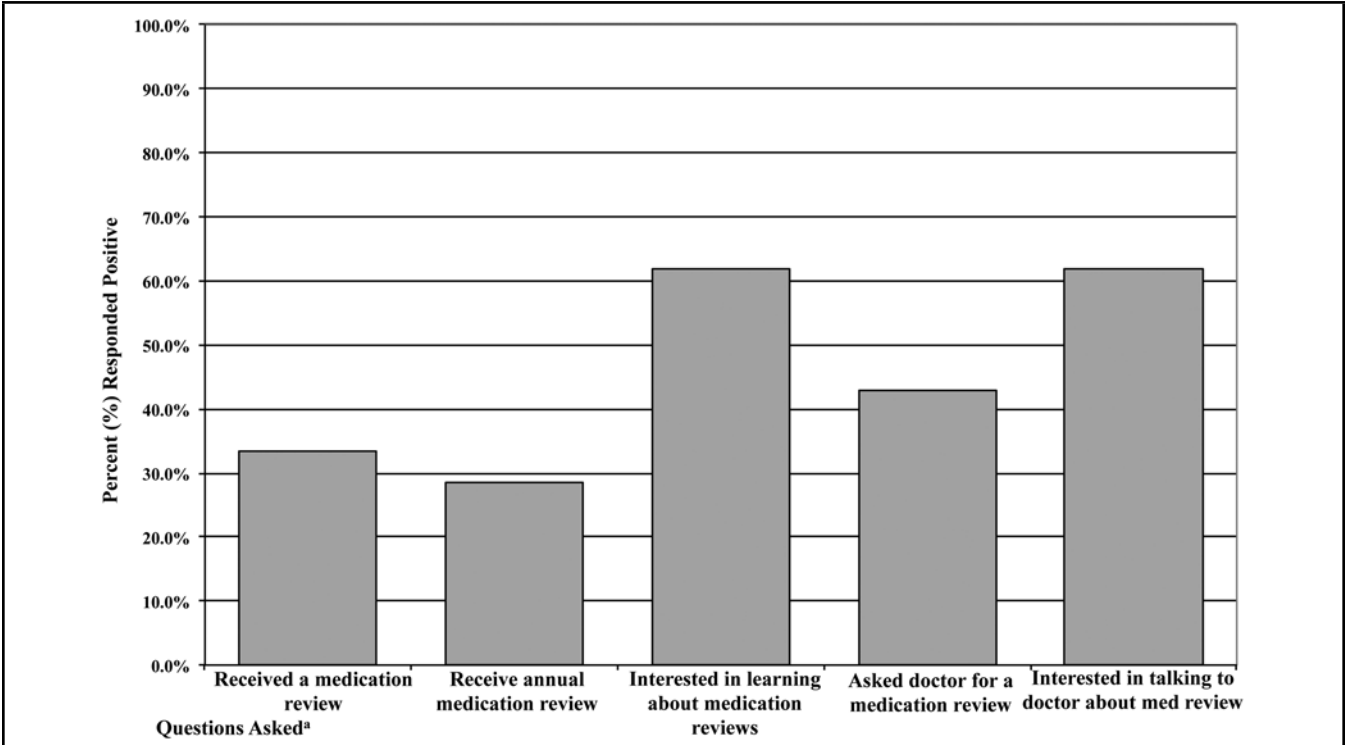


Figure 4. Medication Reviews: The figure shows the percent of participants who responded positively to the label corresponding to the survey item. ^aThe response "Not Sure" was not included in the analysis.

Figure 3 shows the results obtained on physician-patient communication. Over 90% of participants reported positively (“Strongly Agree” or “Agree”) for survey items regarding physician-patient communication. The majority of the participants felt comfortable talking to their doctors, and asking questions when they needed clarification. Results show that the participants believe that their primary care physician knows all of the medications being prescribed to them (including those prescribed by other physicians), and are knowledgeable of all the medications the participants are currently taking. However, Figure 3 also shows that less than half of the participants believe they were knowledgeable about multiple medication use and medication reviews. The majority of participants did not believe that they had the ability to describe what a “drug-drug interaction” was (76.2%) or the purpose of a medication review (61.9%).

Multiple Medication Use & Medication Reviews

Figure 4 displays the percentage of those who responded positively regarding multiple medication use and medication reviews. About one-third of the participants reported receiving a medication review. Six participants (28.6%) reported receiving an annual medication review. Less than half (42.9%) of the participants, had asked their doctor for a medication review. However, more than half of the participants (61.9%) were interested in learning and talking to their doctors about a medication review.

There were four questions from the survey that the participant selection of the response “Not Sure” or “Neutral” was greater than 20-percent (Table 2). Five participants (23.8%) responded “Not Sure” when asked if they ever had an adverse reaction to their medication(s). Five out of 20 participants (25.0%) responded “Neutral” and “Not Sure” to whether they believed they had the ability to describe the purpose of a medication review and if they were currently receiving an annual medication review, respectively. Furthermore, 28.6% (six participants) were not sure if they had ever received a medication review.

Correlations Between Measures

A significant association was found for individuals who have someone (other than their physician) to help them with their medications and those who utilize tools for referencing their medications (Table 3). In this association, a participant who receives help with their medications from another individual was more likely to also use a printed medication schedule or tool to help them remember to take their medications. A significant association was also determined between the number of medications an individual took and the number of doctors or specialists they visit. In this association, the more providers a participant received care from, the more medications they were likely to be taking.

Discussion

The results from this study suggest that while participants feel comfortable communicating with their doctor, the content of these conversations may not include polypharmacy issues and

Table 2. Percentage of Participants that Responded “Not Sure” or “Neutral” to Survey Questions

Survey Question # (see appendix)	% - “Not Sure” or “Neutral”
7	15.8%
8	9.5%
9	4.8%
10	4.8%
11	10.0%
12	0.0%
13	14.3%
14	23.8%
15	6.7%
16	0.0%
17	5.3%
20	0.0%
21	0.0%
22	0.0%
23	0.0%
24	15.0%
25	25.0%
26	28.6%
27	25.0%
28	9.5%
29	0.0%
30	5.0%

medication reviews. Many participants were uncertain about details concerning their medications. In addition, participants did not demonstrate confidence about understanding the adversities associated with multiple medication use and the importance of completing medication reviews. Furthermore, most of the participants responded that they had not received or were unsure about receiving medication reviews. This result serves to emphasize that while participants feel their physician is open to communication, there may be a lack of communication occurring where medication reviews are concerned. When asked if they were able to describe a “drug-drug interaction” or the purpose of a medication review, the responses ranged from disagree to neutral. Participants were either unsure about these questions or about the topics these questions were in reference to. However, it was encouraging that more than 60% of the population was interested in learning about medication reviews and talking to their doctor about a medication review.

The correlation analysis provided insight into associations between measures. The association found between the number of providers for a participant and the number of medications they are taking suggests that seeing multiple doctors may increase the likelihood of taking multiple medications. While causal relationships cannot be inferred, this association may indicate that each doctor is prescribing a medication, thereby increasing the overall number of medications for a patient. This finding

Table 3. Correlations Between Measures						
Measures	Number of Medications	No Adverse Reaction	Someone Who Helps	Printed Schedule/ Tool	Number of Doctors/ Specialists	Number of Pharmacies
Highest Education Level	0.24	0.04	0.36	0.35	0.24	-0.26
Number of Medications		-0.41	0.20	0.08	0.78*	-0.09
No Adverse Reaction			-0.21	-0.30	-0.37	-0.34
Someone Who Helps				0.70*	0.12	0.07
Printed Schedule/ Tool					-0.02	0.28
Number of Doctors/Specialists						0.12

* Pearson's correlation coefficient significant at $P < .05$.

exemplifies the importance of effective patient-physician communication as well as communication among physicians caring for the same patient to reduce adverse drug-drug interactions.

Another interesting finding is the association between individuals who have someone helping them with their medication regimen and those who utilize tools for referencing their medications. Further research is needed to understand why this association is occurring. Possible reasons may be that the individual assisting the participant is using the medication tools (pillboxes, printed charts) to care for the participant or the assisting individual is teaching the participant to use them. Another reason could be that some participants are more likely to seek help from any and all available sources, whether they be a person or tool. Thus, future studies could delve deeper into the associations found in this exploratory study.

In Hawai'i, the effects of a medication review by geriatricians in a nursing home were analyzed.¹¹ The study involved a review of a patient's medication list, consulting Beers' Criteria online, and recommending medication changes to the patient's primary physicians.¹¹ Results showed that 46.2% of the patients were on nine or more medications.¹¹ The ethnicities of the patients were not specified. After a physician intervention, the average total of medications declined, demonstrating that the application of a system of medication guidelines and tools can significantly reduce polypharmacy.¹¹

Interventions that have targeted reducing polypharmacy among the elderly population have placed emphasis on the role and responsibility of the physician. Hanlon, et al, performed a trial in Durham, North Carolina, of a clinical pharmacist intervention in elderly outpatients with polypharmacy to improve inappropriate prescribing.¹² Clinical pharmacists met with the intervention group to evaluate medications, give general drug information, and make recommendations that were sent to the patient's physician.¹² After one year, there was a 23% difference between groups in the reduction of inappropriate prescribing.¹² Thus, pharmacists can also make a significant contribution to improving prescription appropriateness for elderly adults.¹²

There is a movement within healthcare to improve communication and availability of patient information at the point of care through Health Information Exchange (HIE) and other Health Information Technology (HIT). As more providers adopt electronic health records and exchange patient information,

the quality of communication between patients and among their providers in regards to multiple medication use is likely to improve. Communication among a patient's physicians is important, and it can be facilitated by technologies that allow physicians to readily identify all the medications taken by a patient to reduce the occurrence of adverse drug-drug interactions. HIT tools may also help patients access information about their medications and remind them how and when to take them. Interventions testing such applications among high risk populations in Hawai'i are also needed.

The data from this needs assessment indicates a need for an intervention that is focused on multiple medication use and medication review awareness and education. An intervention should address important findings from the study such as the results indicating that most participants did not have another individual, a medication schedule, or another tool to aid them in keeping track of their medications. An intervention should especially target those individuals who feel they have difficulty following their medication regimen, but are not utilizing any tools to help themselves. In addition, further analysis should be done to assess the relationship between the measures, and to test causality of having an adverse reaction to medications. Geriatric individuals are more susceptible to adverse effects due to polypharmacy simply due to physiology and co-morbidities associated with aging. An intervention is needed to address these health issues to ensure that elderly patients are better equipped to manage their multiple medication use.

Limitations & Conclusion

Due to limited resources and time constraints, only two local housing sites were selected for participation in this study. One of the limitations was the participation of the residents in the housing sites for the study. Between the two housing complexes, which serves a maximum of 170 individuals at any given time, only 21 people chose to participate. Only a small concentrated population was studied for multiple medication use and adversities associated with polypharmacy. This small sample size limited our ability to conduct sub-analyses, and may not be a representative sample of the study population. The number of individuals living at the housing sites, and their distribution by gender is unknown. Therefore, it is unknown if a majority of the residents are female since a greater proportion

of females chose to participate in the study. In addition, this was a retrospective study which may have lead to a recall bias in answering the survey questions.

It is difficult to generalize the results of this exploratory study to broader populations in Hawai'i. However, issues regarding polypharmacy and patient-physician communication among elderly individuals has not been studied extensively in Hawai'i, and there is limited data in the literature that approaches polypharmacy from a patient perspective. Physician-patient communication is an important component to for reducing possible adversities due to polypharmacy. This is a serious issue that needs to be further assessed and addressed accordingly. A more representative island-wide or state-wide study should be completed in the future to further assess multiple medication use and adverse polypharmacy among at-risk populations like the elderly. Future studies and interventions should also include a focus on determining causes of adverse reactions due to medications. Polypharmacy has often been approached from the provider's side. It would take considerably more time and resources to engage and educate healthcare providers on issues regarding polypharmacy, especially within the fragmented structure of the system where physicians are not always in direct contact with one-another. This study has attempted to approach polypharmacy from a patient perspective and future studies could aim at improving patient awareness on polypharmacy, and empowering them with the knowledge and tools they need to successfully reduce chances of adversities due to polypharmacy.

Conflict of Interest

None of the authors have any conflict of interest.

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Appendix

Medication Review Assessment Survey

Instructions: Please circle the answer choice or fill in the blank next to the question. Keep in mind that this survey is voluntary, and you do not have to respond to any questions that you do not feel comfortable answering. If you require clarification or have a question, feel free to ask Alain or Dr. Nigg. When you are done you can turn in the survey to Alain or Dr. Nigg.

Demographics

1. What is your birth year? _____
2. What is your gender? Female Male
3. What is your ethnicity? (Please Select One): American Indian/Alaska Native/Eskimo/Inuit Korean
Asian Indian Laotian
Black Malaysian
Cambodian Mexican
Caucasian Micronesian
Chinese Portuguese
Fijian Puerto Rican
Filipino Samoan
Guamanian/Chamorro Tongan
Hawaiian Vietnamese
Japanese Other (Please Specify) _____
4. What is your highest level of education received?
< High School High School/Some College College Degree Post-Bachelor
5. What is your preferred method of contact?
Postal Mail E-Mail In-Person/Face-to-Face Other: _____

Continues

Medication Use

6. What are the total number of prescription medications, over-the-counter medications, vitamins or minerals, dietary supplements, and herbs you are currently taking?
0 1 2 3 4 5 6 7 8 9 10+
7. Do you have difficulty keeping track of your medications?
Strongly Agree Agree Neutral Disagree Strongly Disagree
8. Do you have trouble taking your medications?
Strongly Agree Agree Neutral Disagree Strongly Disagree
9. Would you be able to describe the purpose for all your medications?
Strongly Agree Agree Neutral Disagree Strongly Disagree
10. Would you be able to describe the instructions for all your medications?
Strongly Agree Agree Neutral Disagree Strongly Disagree
11. Would you be able to describe the side effects for all your medications?
Strongly Agree Agree Neutral Disagree Strongly Disagree
12. Do you believe it's okay to take another person's medication?
Strongly Agree Agree Neutral Disagree Strongly Disagree
13. Would you be able to describe if any of your medications had a risk of addiction?
Strongly Agree Agree Neutral Disagree Strongly Disagree
14. Have you ever had an adverse reaction from your medication(s)?
Yes Not Sure No
15. If you answered "Yes" to Question 14 above, did you ask your doctor about it?
Yes Not Sure No
16. Is there someone (other than your physician) who helps you keep track of your medications?
Yes Not Sure No
17. Do you have a printed schedule or other tool you refer to for taking your medications?
Yes Not Sure No

Physician-Patient Communication

18. How many doctors/specialists do you visit?
0 1 2 3 4 5 6 7 8 9 10+
19. How many pharmacies do you use?
0 1 2 3 4 5 6 7 8 9 10+
20. Are you comfortable talking to your doctor(s)?
Strongly Agree Agree Neutral Disagree Strongly Disagree
21. Are you comfortable asking your doctor(s) questions?
Strongly Agree Agree Neutral Disagree Strongly Disagree
22. Does your primary care physician know all of the medications you are being prescribed?
Strongly Agree Agree Neutral Disagree Strongly Disagree
23. Does your primary care physician know all of the medications you are taking including prescription and non-prescription (over-the-counter, herbal supplements/vitamins, etc)?
Strongly Agree Agree Neutral Disagree Strongly Disagree

Multiple Medication Use & Medication Reviews

24. Would you be able to describe what a "drug-drug interaction" means?
Strongly Agree Agree Neutral Disagree Strongly Disagree
25. Would you be able to describe the purpose of a medication review?
Strongly Agree Agree Neutral Disagree Strongly Disagree
26. Have you ever received a medication review?
Yes Not Sure No
27. Do you currently receive an annual medication review?
Yes Not Sure No
28. Would you be interested in learning more about medication reviews?
Yes Not Sure No
29. Have you ever asked your doctor for a medication review?
Yes Not Sure No
30. Would you be interested in talking to your doctor about a medication review?
Yes Not Sure No

** Some of the questions included in this survey were taken from the Hyperpharmacotherapy Assessment Tool (HAT), and modified to fit the needs of this study. The original questions can be found in the following journal article: Bushardt, R. L., Massey, E. B., Simpson, T. W., Ariail, J. C., & Simpson, K. N. (2008). Polypharmacy: Misleading, but manageable. *Clinical Interventions in Aging*, 3(2), 383-389.

MEDICAL SCHOOL HOTLINE

Student Perspectives on International/Rural Experiences in Medical Education

Thomas Jessie Aldan MSIII; Marina Morie MSIII; Jennifer Lee MSIII;
and Kelley Withy MD, PhD

The Medical School Hotline is a monthly column from the John A. Burns School of Medicine and is edited by Satoru Izutsu PhD; HJMPH Contributing Editor. Dr. Izutsu is the vice-dean of the University of Hawai'i John A. Burns School of Medicine and has been the Medical School Hotline editor since 1993.

Three John A. Burns School of Medicine (JABSOM) first-year medical students embarked on a new and unique clinical learning experience in the island of Pohnpei, where they were exposed to the medical, cultural, and historical and public health issues that are pertinent to this specific region. During July 2011, JABSOM sent first-year students to Micronesia through the medical school's Hawai'i/Pacific Basin Area Health Education Center (AHEC) and the partnering Guam/Pacific AHEC. This unique opportunity allowed medical students to learn and train in this rural environment.

The history of Pohnpei State and its citizens bears striking similarity to that of Hawai'i. Centuries of colonization by European and Asian cultures left their marks on the Pohnpeian language and customs, while currently the indigenous population struggles to conform to a Western lifestyle. What has resulted is a significant prevalence of non-communicable diseases such as obesity, diabetes, and hypertension.¹

Pohnpei State is one of the four states of the Federated States of Micronesia (FSM), with an estimated population of 34,000 people.¹ Similar to many developing countries today, the population of the FSM is relatively young, with 37% of people under 15 years of age and only 3% of individuals 65 years or older. Contrary to what may be expected of a population with these demographics, the average population growth rate has declined from 3% between 1980-1990 and 0.3% between 1994-2000. This decline is primarily attributed to the migration of the indigenous people to the United States due to inadequate health and education systems within the FSM.¹

Within this setting, the first-year medical students from JABSOM spent their 2011 summer elective precepting at Pohnpei State Hospital, the Department of Public Health, and the Pohnpei Family Health Clinic. This distinctive opportunity allowed the students to learn valuable medical, public health, social, and cultural lessons as part of their medical training.

Medical Landscape of Pohnpei

Pohnpei's unique medical history, which can be described in 3 general stages, has laid the framework for its current health-care state. The first stage was marked by the introduction of infectious diseases such as influenza, smallpox, and measles,

as foreign ship traffic increased during the nineteenth century. Between 1840 and 1900, the population of Pohnpei decreased by approximately 65%.¹

The second stage began with the onset of German occupation, beginning in 1898, until the end of World War II in 1945. The German administration opened the first hospitals in Pohnpei intended for the local populations, started implementing quarantine measures for foreign ship crews and passengers, and introduced regular vaccination practices for diseases such as smallpox.¹

The third, stage started in the 1960s, as the number of jobs increased and many Micronesians gained disposable cash income. As a result, diet changed from local produce and seafood to affordable and highly processed foods of the Western world. In addition, Micronesians adapted to a relatively sedentary lifestyle offered by modern conveniences, and abandoned more physically intensive traditional practices like fishing and farming. These lifestyle changes resulted in an increase in the prevalence of non-communicable diseases, such as diabetes and heart disease.¹ The increased prevalence of non-communicable disease put a major burden on a healthcare system that lacked preventative education and medical outreach services. Both non-communicable diseases and infectious diseases such as tuberculosis and Hansen's disease cause substantial health concerns for Pohnpei's public health officials.

Today, much of the financial burden of these medical services has been transferred to the State of Hawai'i. Large numbers of people from the FSM immigrate to Hawai'i to seek care at hospitals, community health centers, and cancer treatment facilities. Their reason for leaving the FSM is almost unanimous: to seek medical services unavailable in the FSM, and thus improve their quality and length of life.

Under the Compact of Free Association (CoFA), citizens of the FSM, the Republic of Marshall Islands, and the Republic of Palau are allowed to work and reside in the United States, without an immigration visa. However, some arrive in Hawai'i without the resources and/or education to secure an adequate livelihood. Others are too ill to work, and subsequently end up homeless or in other substandard living conditions.

Current Healthcare Situation in Pohnpei

The JABSOM medical students rotated at Pohnpei State Hospital to learn how the physicians provide health care in this rural environment. Pohnpei State Hospital is an open air, one-story concrete building located at the edge of downtown Kolonia. Each ward consists of a small nurses' station at one end, and two long lines of patient beds at the other. Minimal privacy is attained by drawing curtains around each bed. Most patients prefer to keep them open to allow the humid air to circulate between the fans and open windows. The majority of basic health care is provided by the state with a large percentage of the population receiving care at Pohnpei State Hospital. Private insurance is available but often unaffordable to the general public. Patients with private insurance receive prompt care at private clinics or the competing private hospital. Furthermore, the charge to stay overnight as an inpatient is \$10/day. However, for \$30/day a patient may have a private air-conditioned room, demonstrating the directly juxtaposed disparity between the poor and the wealthy.

In recent years, there has been a shortage of medically-trained professionals throughout the FSM. One contributing challenge is that there are very limited skills-training programs on the island. In addition, those with the financial luxury to seek higher education elsewhere often do not return home because of the opportunity to earn a much higher salary outside of the FSM. To make up for the shortage of physicians and nurses needed to care for the ailing population, the hospital contracts employees from the Philippines. This has created a new set of challenges, such as language barriers and lack of cultural competency. The transient nature of the medical staff does not allow enough time to master the Pohnpeian language, so most patient interviews are conducted in broken phrases of English and Pohnpeian.

The biggest day-to-day obstacle that the hospital faces is the high cost of health services for a population without the means to pay for them. Physicians rely on developed history and physical exam skills to make a diagnosis because it is extremely costly to maintain diagnostic equipment in the facility. There is no computed tomography, magnetic resonance imaging, or blood bank on the island. Even the simple luxury of electricity is not taken for granted as the island's generators frequently fail throughout the day.

The impact of high medical costs is not limited to diagnostic studies, and often causes restrictions in optimal patient management. For example, in the United States, the standard treatment for chronic obstructive pulmonary disease (COPD) is an inhaled long-acting beta-agonist like salmeterol, which is an expensive drug that is not available in the Pohnpei hospital's pharmacy. Instead, patients with COPD routinely visit the emergency department (ED) to be treated for COPD exacerbations with albuterol, a short-acting beta-agonist, administered via nebulizer, and often end up staying at the hospital for an extended period of time. The diagnosis of COPD in the FSM often means an inevitable rapid decline for the patient, secondary to lack of adequate maintenance therapy. An example of this situation was a gentleman with COPD admitted for dyspnea who remained

in the medical ward on oxygen throughout the duration of the medical students' stay (25+ days).

Public Health in Pohnpei

As a part of the Pohnpei medical experience, the medical students spent one week with the Public Health team. During this week, one of the most memorable experiences was spending a day with the Tuberculosis (TB)/Hansen's disease program and accompanying the Direct Observation Treatment Short-course (DOTS) team as they distributed TB medications to patients outside of Kolonia where modern conveniences are rare and most people depend on the land for sustenance. Many of the patients live with large extended families in homes with bare floors and walls, and no electricity. The people were extremely hospitable and generous, offering gifts such as warm mashed taro with coconut milk that they had harvested and cooked from their own crops.

The JABSOM students also worked with Dr. Eliazar Johnson, the director of the TB/Hansen's disease program. Dr. Johnson hopes to eliminate Hansen's disease from FSM by the year 2015. To achieve this goal, he utilizes a geographic information system (GIS) to track and plot TB and Hansen's disease cases on Pohnpei. All TB and Hansen's disease cases are handled on the island, and care is taken to treat the patients promptly and effectively. Dr. Johnson and his team hope to prevent outbreaks of multi-drug resistant TB, as has been reported in Chuuk,¹ by identifying and treating active cases of TB early before they have a chance to gain strength and spread. These methods are essential in a culture where large families live closely under one roof.

In addition, the medical students worked at various outpatient clinics hosted by the public health department throughout the week, serving specific patient populations. Prenatal care clinics, diabetes clinics, family planning clinics, and pediatric vaccination clinics attract locals from Kolonia, the state's capitol, as well as outer towns. However, many people living outside of Kolonia do not own cars, so traveling into Kolonia can easily take a few hours. Another means of transportation are local style taxis that pick up multiple passengers along the way similar to a bus system. However, unlike a bus system, there are no schedules or predetermined routes. Streets outside of Kolonia have only one lane per direction, and most are poorly paved. It is an arduous journey for these outer town people to travel to the clinics simply to receive routine medical care.

These clinics are of utmost importance to the people of Pohnpei, especially pregnant women, people with diabetes, and children. Many of the expectant mothers are young and require prenatal antibiotics for treatment of infections such as chlamydia. The patients with diabetes often have difficulty modifying their lifestyles to control their blood glucose and require routine monitoring to prevent dire consequences such as kidney failure and limb amputations. Furthermore, these clinic visits are the only time that patients with diabetes are able to check their blood glucose levels since personal glucose monitors are a luxury. Children have access to vaccinations at

these clinics that will prevent contracting and spread of easily preventable diseases. The next steps for these public health initiatives require focus on maintaining adequate drug supplies and making routine outpatient care more readily accessible to those living outside of Kolonia.

Dr. Isaac's Clinic

While in Pohnpei, the medical students were mentored by Dr. Bryan Isaac, a JABSOM graduate. Dr. Isaac exemplifies the definition of a family physician. A master of all trades, Dr. Isaac manages a variety of ailments: infectious disease, chronic conditions (eg, hypertension and diabetes), prenatal care, and minor injuries requiring surgical intervention. To practice medicine efficiently in rural Pohnpei, Dr. Isaac must be self-sufficient: he performs his own lab tests, microscopy, electrocardiograms, and ultrasound. This is vastly different from the hospitals in Honolulu where medical students train with nurses or technicians who perform many of the services mentioned. Due to the unpredictable shipping schedules, Dr. Isaac is often forced to sterilize and reuse items that are typically considered disposable in US medical facilities such as ear speculums and nebulizer mouthpieces. This practice is also common at the Pohnpei State Hospital.

Dr. Isaac places a strong emphasis on preventative medicine and lifestyle modifications. He has had several patients with diabetes successfully wean off their medications through diet and exercise. This is quite a feat since the medical students were told many times that one-third of Pohnpei's population is afflicted with diabetes. Preventative medicine is especially valuable in a place such as the FSM where subspecialty services are accessible only off-island in the Philippines or Hawai'i.

The medical students witnessed firsthand how difficult it can be for patients in Pohnpei to receive subspecialty services. During their experience with Dr. Isaac, the students encountered a patient who required an arteriovenous (AV) fistula placement in preparation for dialysis treatment. This process was extremely costly to the patient, as it required travel to the Philippines. Even with a successful AV fistula placement, there were only 2 dialysis units at the state hospital, both of which were being at maximum capacity.

In exchange for inpatient admission privileges to Pohnpei State Hospital, Dr. Isaac works as the state hospital emergency department (ED) overnight call physician twice monthly. Unfortunately, many people utilize the ED as an outpatient clinic, especially at night when patients know the cashier's office is closed, to avoid confrontation regarding unpaid medical bills. However, when the medical students joined Dr. Isaac for the first time on an overnight shift, they were in for a lesson that they would never forget.

Two male family members brought an unresponsive man into the ED after he had collapsed onto the floor at home. It had taken the family over 30 minutes to drive the lifeless patient to the hospital. The "ambulance" in Pohnpei is similar to a transportation service, as the drivers do not have medical

training, and the transportation time is often too long to provide adequate resuscitation care upon arrival at the hospital.

Dr. Isaac wasted no time as he instructed the medical students to perform CPR and apply a bag-valve mask, and the nurse to retrieve the defibrillator and begin administering shocks. Despite these efforts, the patient could not be revived. The first-year medical students were confronted with the shock of a patient death, much earlier than expected in their medical education. It was a situation far removed from the PBL (Public Based Learning) cases and standardized patients they had been exposed to at JABSOM.

Dr. Isaac's training and expertise truly make him well suited to deal with the variety of conditions that come to his office. He is an eager teacher who encouraged students to participate in physical exams and patient education. He is truly an amazing resource as JABSOM sends future groups of medical students to the FSM for an experience that will surely redefine their definition of rural medicine.

Conclusion

The time spent in Pohnpei allowed the medical students to reflect on why so many Pohnpeians come to Hawai'i seeking healthcare. While JABSOM students realize early in their training that they will encounter many patients from Micronesia, students are also aware there is a significant workload in front of them, as Hawai'i's limited resources (financial, personnel, etc.) will not be able to match the demand set forth by the increasing patient load. Many who migrate to Hawai'i seeking healthcare have not been receiving adequate care in Micronesia, making for more complicated medical cases. Many of these patients are further hindered by lack of financial resources, language barriers, lack of healthcare-seeking knowledge, and the burden of adjusting to a new, often more complicated social environment. On a similar note, healthcare providers in Hawai'i may find it difficult to treat patients from the Freely Associated States since many of the patients cannot adequately provide their personal medical history, critical in the creation of a successful treatment plan. Cultural notions of health and healthcare-seeking behavior in the FSM may also hinder local physicians from providing the care needed to manage chronic problems such as diabetes and heart disease. Furthermore, many of these patients do not have the financial resources to fill prescriptions and receive the interventions necessary to manage complicated chronic disease.

The experience in Pohnpei introduced the JABSOM students to the political and medical landscapes of Pohnpei, and how these issues relate back to the Micronesian patients that they encounter in Hawai'i. The students now understand the cultural factors that give rise to stereotypes and are better equipped to provide the care and understanding that will help the Micronesian patient population. Not every individual of Pohnpei can be fit into a specific description of "what it means to be a Pohnpeian." Also the status of people of Pohnpei cannot be generalized from the medical students' experiences, but this trip offered a chance to learn and experience the local culture and history of Pohnpei,

as well as the medical issues that afflict this island state. This experience in Pohnpei has encouraged the medical students to strive to become physicians who are not only competent in the science of medicine, but who are also understanding and considerate of patients' cultures and personal challenges.

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INSIGHTS IN PUBLIC HEALTH

Public Health Laboratory Workforce Outreach in Hawai'i: CLIA-Focused Student Internship Pilot Program at the State Laboratories

A. Christian Whelen PhD and Kent Kitagawa MPH

Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJMPH Associate Editors Jay Maddock PhD from the Office of Public Health Studies at John A Burns School of Medicine and Donald Hayes MD, MPH from the Hawai'i Department of Health in collaboration with HJMPH Manuscript Editors Tonya Lowery St. John MPH and Ranjani Rajan MPH from the Hawai'i Department of Health.

Abstract

Chronically understaffed public health laboratories depend on a decreasing number of employees who must assume broader responsibilities in order to sustain essential functions for the many clients the laboratories support. Prospective scientists considering a career in public health are often not aware of the requirements associated with working in a laboratory regulated by the Clinical Laboratory Improvement Amendments (CLIA). The purpose of this pilot internship was two-fold; introduce students to operations in a regulated laboratory early enough in their academics so that they could make good career decisions, and evaluate internship methodology as one possible solution to workforce shortages. Four interns were recruited from three different local universities, and were paired with an experienced State Laboratories Division (SLD) staff mentor. Students performed tasks that demonstrated the importance of CLIA regulations for 10-15 hours per week over a 14 week period. Students also attended several directed group sessions on regulatory lab practice and quality systems. Both interns and mentors were surveyed periodically during the semester. Surveys of mentors and interns indicated overall positive experiences. One-on-one pairing of experienced public health professionals and students seems to be a mutually beneficial arrangement. Interns reported that they would participate if the internship was lower paid, unpaid, or for credit only. The internship appeared to be an effective tool to expose students to employment in CLIA-regulated laboratories, and potentially help address public health laboratory staffing shortfalls. Longer term follow up with multiple classes of interns may provide a more informed assessment.

Introduction

The Hawai'i Department of Health's State Laboratories Division (SLD) suffered from chronically vacant positions even before the national economic crisis that began in 2008. From 2008 to 2010, the nation lost 19% of its government public health workforce – approximately 44,000 jobs.¹ During the crisis, Hawai'i Department of Health lost vacant positions, conducted a reduction-in-force, and furloughed employees for 2 days a month. The SLD was not spared, losing 15 positions in 6 months while responding to the influenza A pandemic caused by pdm(H1N1),² which was only possible due to integrated laboratory preparedness throughout the state.³ The challenges facing Hawai'i's public health laboratory workforce are not unique, but are compounded by geographic isolation. Both California⁴ and Wisconsin⁵ recently issued reports documenting problems in their states. Health System Change,⁶ the American Public Health Association,⁷ and the Association of Public Health

Laboratories (APHL)⁸ have all reported employee shortfalls at the national level.

A capable and robust public health laboratory workforce is critically important to ensure that high standards of science, safety, and security are maintained to solve state and national problems.⁹ Prospective scientists considering a career in public health are often not aware of the requirements of working in Clinical Laboratory Improvement Amendments (CLIA)-certified laboratories, which conflicts with the needs of chronically understaffed public health laboratories which expect employees to assume broad responsibilities in a heavily regulated environment (Table 1). Likewise computer science majors are unlikely to be oriented to laboratory information management systems, which have had a dramatic impact on ordering and resulting even if their degree program had a health informatics emphasis. These challenges are compounded by the dilemma of an aging workforce and tangential difficulties in recruiting and retaining highly qualified employees; in 2006 the average age of the nation's state public health worker was 46.6 years with 50% eligible to retire within a few years.⁷ Public health laboratories lost 10% of their workforce in the 18 months from 2010 to mid-2011.¹ Moreover, potential candidates, which consist of students and graduates in various laboratory science disciplines, lack awareness about the opportunities, work environment, and prerequisites related to public health laboratory careers – most discover public health by “accident.”

SLD Workforce Problems	Internship Program Goals
Understaffed laboratories	Employ students to help with workload
Aging public health workforce	Expand future potential workforce
Lack of awareness about public health careers	Expose students to work in a public health laboratory
Difficulties recruiting/retaining qualified employees	Pair students with an experienced mentor to stimulate interest in public health careers
New graduates lack the knowledge, skills, & abilities needed to succeed in a CLIA-regulated laboratory	Students perform tasks to gain knowledge, skills, & abilities related to CLIA-regulated work

Methods

The Hawai'i State Laboratories Division (SLD) conducted a pilot, 14-week paid internship program during Spring 2012 which focused on CLIA and quality systems. The SLD would accept up to 4 interns; 3 in public health microbiology and 1 in health systems informatics. Internship candidates were recruited using the student job website of the University of Hawai'i at Manoa, and by word of mouth. Candidates submitted resumes and cover letters, and the 4 candidates that were interviewed were also selected.

One student was placed in each of four sections with a volunteer staff mentor: Laboratory Emergency Response Program (LERP), Virology, Information Technology, and Central Services. A CLIA-based syllabus was used to guide interns and mentors to perform tasks that demonstrate the importance of CLIA regulations and quality systems. The syllabus had a checklist of technical work areas that the mentor and intern agreed to focus on for practical experience. Students also attended several directed, interactive group sessions during which SLD staff lead presentations on federal and state law requirements governing human clinical testing. These sessions were also used to frame Quality Systems, and the applicability to laboratory

practice. Interns worked between 10 and 15 hours each week with mentors who reinforced regulation and service to clients, and were paid a wage of \$10.00/hour.

Program goals included introducing students to the knowledge, skills, and abilities necessary to work in a CLIA-regulated environment, and expanding the talent pool for future workplace vacancies. An initial knowledge assessment questionnaire was given to interns that asked about regulatory topics such as CLIA, Hawai'i Administrative Rules, and Health Insurance Portability and Accountability Act. Both interns and mentors completed two surveys (mid-term and end of program) to evaluate the program's efficacy. Lessons learned and challenges were collected based on surveys and other input from student interns, mentors, and other SLD staff participants.

Results

In the initial assessment, interns reported very little understanding of regulation of public health laboratories. For eleven questions on these subjects, the mean response was only 2 on a scale of 1 to 5 (data not shown). In fact, the only score above 3 was acknowledging the importance of Standard Operating Procedures. Selected responses to intern and mentor questions

Survey Question	Midpoint Score	Post Score
"I have improved my understanding of principles of public health"	4.7	4.7
"I understand how CLIA principles are integral to public health laboratory science"	4.2	4.7
"I am considering public health laboratory science as a career"	3.5	4.0
"I would recommend this internship to other students"	4.7	5.0
"I would take/recommend this internship if it paid less"	4.2	4.5
"I would take/recommend this internship if it was unpaid"	4.2	4.2
"I would take/recommend this internship for college credit"	4.75	4.75

Survey Question	Midpoint Score	Post Score
"Sometimes it's hard for me to find things for interns to do"	2.2	2.2
"Mentoring a student has been a valuable experience for me"	3.2	3.75
"Student interns provide valuable assistance with my workload"	3.7	3.5
"I would recommend mentoring a student to other SLD staff members"	4.0	4.0

Students enjoyed variety in their duties
Students enjoyed the mentor-intern relationship and building career connections
Students realized the importance of careful work to ensure accurate laboratory results
Students improved communications skills
Mentors enjoyed having extra help for tasks
Mentors enjoyed learning about their own teaching style
Mentors enjoyed helping students learn
Students liked learning practical skills (ex: use of PPE, cleaning glassware, using instruments correctly)
Students appreciated career advice from experienced professionals in the field

Table 5. Challenges of Internship Pilot Program
Occasional difficulties finding enough tasks for interns
Some students and mentors would like more varied rotations
Some students and mentors would like more background lectures earlier in the program
Scheduling and travel challenges made it difficult to conduct groups sessions
Some mentors suggested interns with a declared major in the same field
Some students wanted to spend more time in the lab (up to 20 hrs per week)

Table 6. Lessons learned: Suggested Actions for a Long-Term Internship Program
Create more structured activities for "down time"
Consider a rotation-based internship program
Consider more intensive background training before students start laboratory work
Better scheduling; consider summer internship when students don't have class
Consider more specific hiring criteria for certain labs
Consider more intensive internship so Select Agent clearance is practical (allowing students to participate in more lab activities)
Pair with universities to offer internship for credit; consider applying for other grants
Identify long-term funding sources, and university partnerships

at the midterm and conclusion of the semester are presented in Tables 2 and 3 respectively. In this set of questions, respondents were asked to respond on a scale of 1 through 5, with 1 indicating "strongly disagree" and 5 indicating "strongly agree." Responses from both interns and mentors were decidedly positive. In addition to questions that required a scaled response, some questions were narrative and all contributed to the success outlined in Table 4 and challenges in Table 5. Lastly, lessons learned are presented in Table 6.

Discussion

The interns reported much improved understanding of CLIA earlier than anticipated (mid-point survey). Both interns and mentors had positive experiences, although interns tended to be more positive. This is not unexpected since interns are gaining new experiences while staff understandably felt burdened with additional duties at times. The internship could have benefitted from more training activities as both groups reported a desire to keep interns busier.

The intern-mentor pairing worked well, but did limit experience diversity. More rotations and a busier pace will be goals of the next iteration. Many of the lessons learned outlined in Table 6 will be applied during the next semester. Although SLD had success with a summer internship through a summer jobs program, which may work better for students because of class schedules and off-campus travel, it was decided to run the next two cycles during fall and spring semesters. It was encouraging to find that interns would recommend internship to others, and would participate even if it was lower paid, unpaid, or credit only. This allows many more options that could benefit both the students and the laboratory.

The lowest scoring question was also probably the most important. When asked if they were considering public health laboratory science as a career, interns responded tentatively. Although interns found the work rewarding, they appeared hesitant to embark on a public health laboratory career; perhaps due to fear of uncertainty. In addition to sustaining the internship, future plans include follow up with students as they complete their academics and move into the workforce, which should provide a better assessment of the long term value of the internship.

Success of the pilot program motivated the State Laboratories to provide internships during the 2012-2013 academic year, which were modified based on lessons learned. For example, interns rotate among mentors and sections which benefits both students and the staff. Furthermore, a credit-only option will be available during the spring 2013 semester, which will allow students who are accepted for an internship to earn senior-level microbiology credit from the University of Hawai'i. Two interns were accepted during the fall semester and 2-3 are projected for the spring semester.

Disclosure Statement

None of the authors identify any conflict of interest.

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OPINION PIECE

Health Reform and Professional Ethics Hawai'i Medical Association Presidential Inauguration Speech

Stephen B. Kemble MD

I have been thrust into Hawai'i Medical Association leadership based on my advocacy for universal health care. Although single-payer health care financing is not American Medical Association policy, I want to thank all of you who have supported me in advocating for truly cost-effective, universal health care that puts the needs of our patients first, in keeping with the highest tradition of professional medical ethics. I also want to thank my family and friends for putting up with my obsessive preoccupation with health care reform over the past 5 years, and with all the time that has gone into what I refer to as "community service," sometimes at the expense of time for family and for my psychiatric practice.

Much of the national discussion and policy initiatives on health care reform have been based on the assumption that runaway health care costs are due to "too much care," either instigated by doctors due to fee-for-service incentives, or instigated by patients who want to "consume" too much care because it is covered by insurance. The assumption that we are delivering too much care is driving efforts to reform physician payment away from fee-for-service and towards pay-for-performance, pay-for-outcomes, bundled payments, capitation, and related schemes intended to counter the supposed incentive under fee-for-service to provide too much care. "Too much care" is also the rationale for increasing cost sharing for patients in the form of higher deductibles and co-payments. However, the beliefs that our health care cost problems are due to "the fee-for-service treadmill" and to patients demanding too much care are fundamental misdiagnoses of the problem. Inadequate access to necessary and appropriate care is a much bigger problem in the United States than excessive care.¹

If fee-for-service were a root cause of runaway health costs, then how are other countries that use fee-for-service payment of doctors able to cover everyone and spend 50-60% of what we do per capita on health care? These other countries include Canada, Australia, New Zealand, Taiwan, Japan, Germany, France, Switzerland, Israel, and many others. Much of the evidence for a large amount of unnecessary care in the United States is based on studies of regional variation in Medicare spending², but if this is due to fee-for-service, then how do we explain the fact that high and low spending regions use fee-for-service equally?

Although some "worried well" patients may be deterred from seeking unnecessary care by increased cost sharing, these patients account for only a tiny fraction of total health expenditures. For the seriously or chronically ill who account for 80-90% of health care spending, increased cost sharing deters necessary

and beneficial care and has been shown in studies to increase total health care costs, especially for the poor and elderly who are the highest risk populations.^{3,4}

So what is causing US health care to cost so much? There is plenty of evidence that administrative complexity is a large part of the problem.^{5,6} This is due to fragmentation of US health care and use of competing health plans to finance health care, whether private health insurance plans provided through employment, or privatized government-funded programs such as Medicaid managed care, Medicare Advantage, and Medicare Part D.

In my opinion, another major factor is the de-professionalization of doctors. There are two broad ethical paradigms in the world of economics: commercial ethics and "guardian" ethics. The commercial paradigm assumes a seller and buyer of goods or services, whose power and interests are balanced through the marketplace and the laws of supply and demand, with financial incentives as a primary motivator. Guardian ethics are applicable to socially necessary services that require specialized training and expertise not available or achievable by the general public, so that there is an inherent imbalance of power between the provider and recipient of services. Classic examples are the military, medicine, and other specialized professions. In these cases, the interests of the public are protected by a tradition of professionalism and concern for the welfare of the public, or patient, or client, which is held to be a higher ethical value than financial considerations.⁷

There has been a movement in this country for the past 50 years to de-professionalize medicine, with an underlying assumption that commercial ethics are the only valid and trustworthy ethics. This justifies increasing interference in health care decisions by hospitals, insurance plans, and government, and an over-reliance on financial incentives to "fix" problems in health care, and especially its high cost.

Medical students start their training with the Hippocratic oath and with an idealistic desire to help others. However, they are often burdened with exorbitant debt, and they discover that half their time is spent "treating the chart" so that the hospital or clinic where they are working can get paid. These problems are compounded by payment reform initiatives that rely on financial incentives, supposedly intended to "improve" care, such as diagnosis related groups (DRG's), pay-for-performance, pay-for-outcomes, and denial of payment for adverse events. These strategies add administrative burdens and generally fail to account for the difficulties in accurately defining "quality" or "outcomes" due to the complexity of health care.

Unfortunately, if doctors are stripped of their professional autonomy and treated as if financial considerations are paramount, they actually do start to abandon professional ethics for commercial ones. They start responding to financial considerations above patient needs; they select patients according to their insurance status; they try to avoid taking on sicker, more complex patients, and they look for ways to game the system or to make more money from things other than professional services. They begin to try to maximize income by any available means, helping drive the cost of health care higher. Sometimes this leads to outright fraud.

If these de-professionalizing forces are combined with fee-for-service, then we do indeed get unnecessary and inappropriate care. Insurance plans and government agencies then double down on monitoring documentation to look for fraud and abuse and try to develop financial incentives to deter unnecessary care. The result is a vicious cycle of escalating administrative burdens, declining access to care for patients who need it, and a demoralized physician work force.⁸ This is exactly what we are now experiencing!

In the effort to slow the escalation in health care costs, whose ox will get gored? Will it be doctors and hospitals, in the form of rising administrative burdens and declining pay? Will it be patients, in the form of increased cost sharing, most of which is not affordable for those with significant health problems, and in declining access to needed care? Or will it be the insurance industry? Only one of these is not an integral part of health care, and the explosion in health care costs in the US is largely on their side of the ledger. However, the insurance industry does not want to be pushed out of health care and they have accumulated a lot of money to protect their interests, hence the focus on blaming doctors and patients for rising costs.

What are the solutions?

1. Although health care does require some administrative functions, we need to minimize the role of competing insurance plans in managing delivery of care. This can be accomplished by developing a unified delivery system for a State or region in which all doctors and hospitals in a community participate, with standardized benefits and payment for providers, so that they are paid the same regardless of the source of funding for an individual patient. This is called an “all-payer” system, with a unified delivery system even if there are several sources of funding.

2. We need public subsidies for medical education in exchange for practicing in underserved specialties and locations, as is being initiated here in Hawaii in the form of a new Hawaii State Loan Repayment program.

3. We need to ensure the cost-effectiveness of care with physician-led quality improvement instead of insurance-driven managed care. Financial incentives such as pay-for-outcomes, bundled payments, and capitation of doctors ignore the complexities of health care and introduce perverse incentives to avoid treating

sicker, more complex patients. They should have no place in quality improvement. A far better approach is William Deming's Continuous Quality Improvement model, as has been demonstrated in auto manufacturing, airline safety, and in health care in some US communities, such as Intermountain Health Care in Utah, Rocky Mountain Health Plans in Western Colorado, and Community Care of North Carolina.^{9,10,11} With Continuous Quality Improvement all errors and quality problems are viewed as system problems, instead of looking for individuals to blame and punish. Everyone involved in health care is enlisted in sharing information and ideas to solve problems and improve delivery of care. Blaming individual doctors and hospitals, whether through individual sanctions or individualized performance and quality ratings tied to financial rewards and penalties, drives everyone into gaming documentation, and when there is an error, into silence and the arms of the attorneys, preventing effective improvement of care.

4. We need to organize doctors for quality improvement. Physician-directed quality improvement requires organization, sharing of information necessary to improve quality, and a mechanism for shared savings from improving care. The alternative to organization of physicians is more managed care administered by insurance plans and government, and the continued de-professionalization of doctors.

5. Quality improvement and efforts to make care more cost effective should not be based primarily on financial incentives, but must be rooted in professional ethics and in the goal of meeting the health care needs of both individual patients and population health.

6. Instead of the complexities of the Resource Based Relative Value Scale and Evaluation and Management procedure codes, let's simply pay doctors for their time, with a multiplier for training and practice costs.¹² Separate quality incentives may be appropriate, but must be in proportion to those components of health care that can be accurately and meaningfully measured, and these are probably only about a quarter of health care due to its complexity. Specialties requiring more training and overhead would be paid at a higher hourly rate, but for each individual doctor this rate would be the same regardless of the activity or procedure being performed. Time for care coordination should be included in reimbursement. This would greatly reduce the complexities required by “pay-for-documentation” and it would allow documentation to be re-focused on patient care and quality improvement instead of reimbursement. If payment were task-neutral, then there would be no preferential incentive to do procedures instead of things like talking to patients and obtaining a good history and thorough physical exam. The primary incentive for physicians would then be to simply use their time and skills, to the best of their ability as professionals, to serve the health care needs of their patients.

7. Above all, we need to place the best interests of our patients at the center of health care again.

Thank you.

October 6, 2012

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UPCOMING CME EVENTS				
Interested in having your upcoming CME Conference listed? Please contact Brenda Wong at (808) 536-7702 x103 for information.				
Date	Sponsor	Location	Meeting Topic	Contact
February 2013				
2/2-2/8	UC San Francisco School of Medicine	Grand Hyatt Regency, Koloa, Kauai'i	20th UCSF International Symposium in Oral & Maxillofacial Surgery	www.cme.ucsf.edu/cme
2/4-2/8	Mayo Clinic	Grand Hyatt Kauai'i	Hawai'i Heart 2013: Echocardiography & Multi-modality Imaging, Case Based Clinical Decision Making	www.mayo.edu/cme
2/10-2/15	Mayo Clinic	Wailea Beach Marriott, Waikoloa	Interactive Surgery Symposium	www.mayo.edu/cme
2/10-2/15	UC San Francisco School of Medicine	Fairmont Orchid, Kohala, Big Island	Current Concept in Neurological & Musculoskeletal Imaging	www.cme.ucsf.edu/cme
2/13	UC San Francisco School of Medicine	JW Marriott Ihilani Resort, O'ahu	High Risk Emergency Medicine Hawai'i 2013	www.cme.ucsf.edu/cme
2/16-2/19	UC San Francisco School of Medicine	Moana Surfrider Hotel, O'ahu	Pacific Rim Otolaryngology Head & Neck Surgery Update Conference	www.cme.ucsf.edu/cme
2/16-2/19	UC San Francisco School of Medicine	Moana Surfrider Hotel, O'ahu	American College of Surgeons Thyroid & Parathyroid Ultrasonic Skills-Oriented Course	www.cme.ucsf.edu/cme
2/17-2/22	UC San Francisco School of Medicine	Sheraton Maui	Infectious Diseases in Clinical Practice: Update on Inpatient & Outpatient Infectious Diseases	www.cme.ucsf.edu/cme
2/18-2/22	Continuing Education Company	Westin Maui, Kaanapali	Primary Care Winter CME Conference	Web: www.cmemeeting.org
March 2013				
3/18-3/21	Postgraduate Institute for Medicine	Grand Hyatt Kauai Poipu Beach	Imaging in Hawai'i	www.imaginginhawaii.com
April 2013				
4/7-4/12	UC San Francisco School of Medicine	Wailea Beach Marriott, Maui	Primary Care Medicine: Update 2013	www.cme.ucsf.edu/cme



IT'S NO LONGER CHEERLEADING, IT'S GYMNASTICS.

A fourteen year-old girl was trying out for the varsity squad of a Michigan, high school cheerleading team. She attempted a back flip without a trained spotter and landed on her head. She suffered fractured cervical vertebrae with damage to her spinal cord. She is paralyzed and on a ventilator. Cheerleading has become the number one cause of catastrophic injury to athletic young women. Data from the Consumers Product Safety Commission shows that rates of injuries from cheerleading accidents moved from about 5,000 annually in 1980 to 26,000 to 28,000 in the past few years. The American Academy of Pediatrics recommends that cheerleading be designated a sport at the high school and collegiate levels. "It should be subject to rules and regulations set forth by sports governing bodies," such as the National Collegiate Athletic Association. The NCAA does not track the number of college cheerleaders' injuries because it isn't considered a sport. Wake up NCAA! It is past time to protect these children.

CURRENT EVENTS CAN BE SHOCKING.

A man climbed a "metal ornamental" transmission tower near Hartford, Connecticut. He was somewhat disconsolate after a spat with his girl friend. He took along a six-pack and downed five beers as he sat on a tower spar to enjoy the evening air. Utility employees later pieced the story together. After his libation he felt the urge to comply with orders from his distended bladder. Because it was 60 feet down, he decided to void where he was and unzipped his fly standing on a supporting bar. The tower has power lines that carry 115,000 volts and one doesn't need to make contact to get a shock. His urine passed near a conducting wire, power surged up the stream to his genitals and blew him off the tower. Power company employees noted a temporary power interruption and came to inspect for possible damage. They found a dead young man with an open fly and a smoking crotch. Oh, and one unopened beer.

IF YOUR CELL PHONE BECOMES A SMELL PHONE, SPONGE IT WITH ALCOHOL.

Jeffrey Cain, MD, President of the American Academy of Family Physicians wants to clean up cell phones. "Some things we think are personal are actually more public than we imagine." A Chicago lab tested eight randomly selected cell phones from a single office. The phones showed no signs of E. coli, strep or staph, but had abnormally high numbers of coliform bacteria, indicating fecal contamination. Dr. Cain observed that people are just as likely to get sick from a cell phone as from a bathroom door handle. Dr. Donald Fredrickson, president of HML testing labs said, "These results are pretty bad," and suggest a lack of hand washing and hygiene. HML tried four different cleaning methods using water, alcohol, Windex and Nice 'N Clean electronic cleansing wipes. Alcohol cleaned nearly 100% of bacteria off the appliance while tap water was almost useless. Don't borrow your coughing friend's cell phone, especially if he/she just returned from the bathroom.

THE HUMAN IMMUNE VIRUS (HIV) MAY BE LURKING BEHIND A HEALTHY FAÇADE.

The US Preventative Services Task Force has recommended that every American age 15 to 65 be tested for HIV. Reporting in the Annals of Internal Medicine, the task force noted that about 50,000 new cases are found each year. The panel assumption is that many are unknowingly spreading HIV before a diagnosis is made. This new draft recommendation is aimed at preventing those people from infecting others. Insurance carriers are worried because, if finalized, private insurers would have to pay for the test. The Centers for Disease Control and Prevention (CDC) did not comment because the recommendation is

only in draft form and subject to public comment. Since 2006 the CDC has recommended routine HIV testing for everyone age 13 to 64.

MORALITY IN THE PHARMACEUTICAL INDUSTRY? CAN YOU SPELL NON SEQUITUR?

A sick patient can't help being angry when profits stand in the way of good medical care. Intractable cases of hepatitis C are on the verge of a therapeutic breakthrough. In an agreement made last year, a pill from Bristol-Myers Squibb Co. was to be combined with one from Pharmasset. Bristol was ready to move to final testing, but before that could be accomplished, the agenda changed. Pharmasset was bought by Gilead Sciences Inc. a rival of Bristol-Myers. Gilead is working on their own drug regimen and derailed the pending action. They declined to discuss why they would not agree to a final-stage trial with Bristol, but it appears to be a financial decision. Donald Jensen, director of the Center for Liver Disease in Chicago, said, "We should put patients before financial interests." Dr. Paul Thuluvath of Mercy Hospital in Baltimore had six patients test the new treatment. He was very excited with the therapy and stated, "We never dreamed we could treat hepatitis C so quickly and effectively without serious side effects. I think the pharmaceutical companies have a moral responsibility to work together and bring it to market."

POUR ME ANOTHER PRUNO. IT REALLY RELAXES ME.

In a Utah maximum security prison, a group of inmates developed signs and symptoms of cranial nerve palsy, eg, double vision, blurred vision, dysphagia and generalized weakness. All were admitted to the hospital and four were placed on ventilators. The Centers for Disease and Control Prevention (CDC) reported findings of botulism poison. Health authorities found the prisoners had consumed an illicit alcoholic brew called "pruno." The probable source of the botulinus in the cocktail was the baked potato brewed with the fruit, sugar and water. Bottoms up!

A STRUTTING CHICKEN IS POULTRY IN MOTION.

In Austin, Texas, a typical Sunday evening at Ginny's Longhorn Saloon features a game called chicken poop bingo. Players put up \$2 to place a bet on a 54 number grid. Ginny, the 77 year-old proprietor, fetches a chicken from an outside pen and places the chicken on the grid. The fowl play takes place on a plywood-covered pool table. Ticket holders gather round and wait for the action which tends to occur with some regularity. Ginny doesn't take any proceeds from the \$114 pot. The Texas Lottery Commission doesn't bother to supervise it. A spokeswoman said it "doesn't meet our definition of bingo." The initial attendance was sparse until local publications and travel guides found out about the game. National Geographic's travel website called it a "popular crapshoot." The idea has irked some animal-rights groups, including People for the Ethical Treatment of Animals. "A crowded bar or stadium with screaming audience is no more a proper place for a chicken than a factory farm." Minnesota has a cow-chip variation played on football fields or other suitable open spaces.

ADDENDA

- The Library of Congress has 327 miles of bookshelves.
- A French kiss is known as an English kiss in France.
- Parenting can only be learned by people that have no children.
- If you long for the pitter-patter of little feet, get a dog. They are cheaper and you get more feet.
- A Canadian is just like an American, but without the gun.

ALOHA AND KEEP THE FAITH *rts*

(Editorial comment is strictly that of the writer.)

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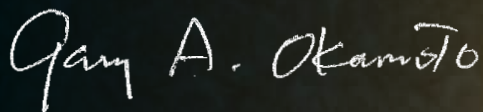
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