

HAWAI'I MEDICAL JOURNAL

A Journal of Asia Pacific Medicine

April 2011, Volume 70, No. 4, ISSN: 0017-8594

**IS THE PREVALENCE OF DOWN SYNDROME BIRTHS IN HAWAI'I
INCREASING?**

Heather McDermott MEd and Jean L. Johnson DrPH

72

**ARTESUNATE: INVESTIGATIONAL DRUG FOR THE TREATMENT
OF SEVERE FALCIPARUM MALARIA IN HAWAI'I**

David M. Callender MD and Gunther Hsue MD

77

**GASTRIC VOLVULUS, BORCHARDT'S TRIAD, AND ENDOSCOPY:
A RARE TWIST**

Anthony P. Cardile DO and David S. Heppner DO

80

MEDICAL SCHOOL HOTLINE

Harnessing Technology for a 21st Century Medical Education

Joseph W. Turban MD

83

UH CANCER CENTER HOTLINE

Life After Cancer Treatment: Caring for Cancer Survivors

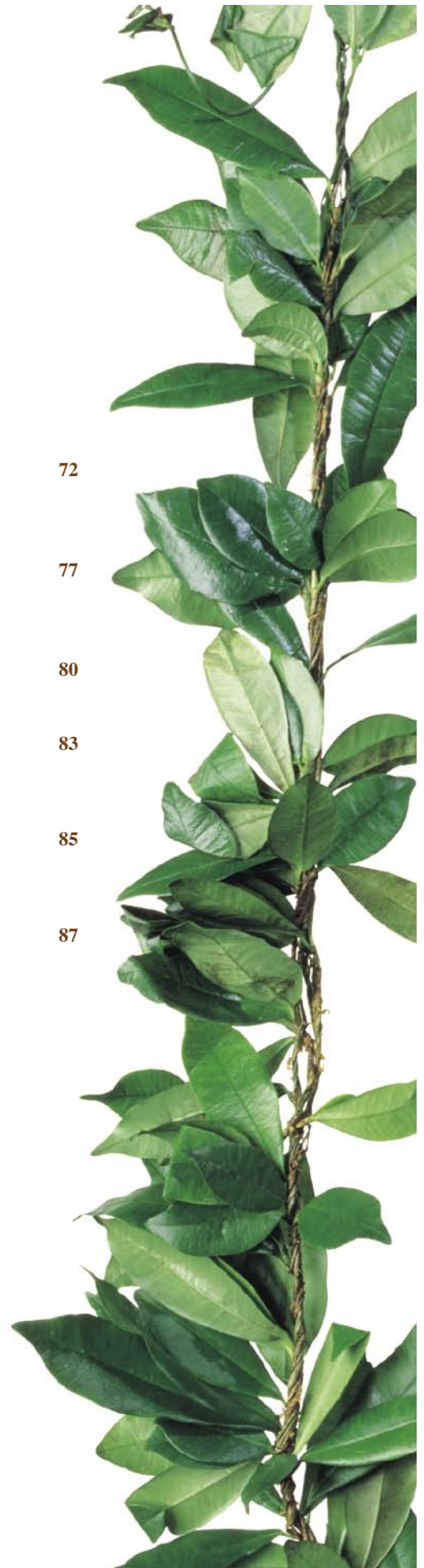
Francisco A. Conde PhD and Andrea Wilburn

85

WEATHERVANE

Russell T. Stodd MD

87



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HAWAI'I MEDICAL JOURNAL

A Journal of Asia Pacific Medicine

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

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

Hawai'i Medical Journal
677 Ala Moana Blvd., Suite 1016B
Honolulu, Hawai'i 96813
Fax: (808) 587-8565
<http://www.hawaiiimediicaljournal.org>
Email: info@hawaiiimediicaljournal.org

The Hawai'i Medical Journal was founded in 1941 by the Hawai'i Medical Association (HMA), HMA was incorporated in 1856 under the Hawaiian monarchy. In 2009 the journal was transferred by HMA to UCERA.

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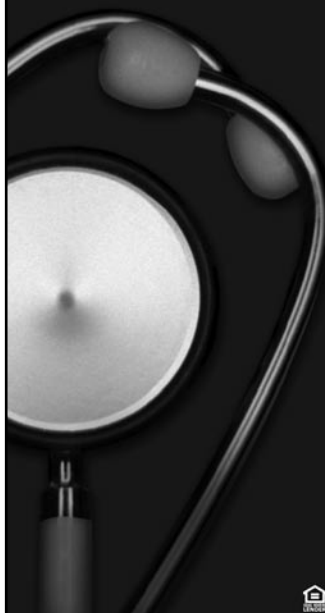
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Is the Prevalence of Down Syndrome Births in Hawai'i Increasing?

Heather McDermott MEd and Jean L. Johnson DrPH

Abstract

Purpose: In response to a study published by the Centers for Disease Control and Prevention (CDC) in 2009, which indicated that the prevalence of Down syndrome births was increasing in the 10 regions studied, this study examined whether a similar trend was occurring in Hawai'i.

Methods: Data were obtained from the Hawai'i State Department of Health Birth Defects Program for the years 1997-2005. The information was analyzed by numbers of live births and outcomes of Down syndrome pregnancies, by ratio of terminations to live births, by age of mother (< 35 years or ≥ 35 years), by maternal ethnicity, and by whether the baby was born with a congenital heart defect (a frequent concomitant condition of babies born with Down Syndrome). These results were compared with previously published studies on the prevalence of Down syndrome births and pregnancies in Hawai'i and were also compared with recently published data of the CDC.

Findings: The study found that the prevalence of Down syndrome births for Hawai'i over the nine-year period did not change significantly. Thus, this finding did not match the findings of the CDC study. Additionally, the data showed that the prevalence of congenital heart defects was higher in Hawai'i than in other areas. However, because of changes in the resources available to the Hawai'i Birth Defects Program, fully comparing in all respects data from the 1997-2005 period with studies conducted earlier in Hawai'i was not possible.

Conclusions: The data identified a number of areas in need of further study. These areas include the following: 1) an examination of the kinds of information and counseling given by primary care providers to women following a prenatal diagnosis of Down syndrome; 2) analysis of the characteristics, values, and choices made by these women to terminate the pregnancy or continue it to term; and 3) determination of why the prevalence of congenital heart defects appears higher among births of babies with Down syndrome in Hawai'i than elsewhere.

Introduction

The prevalence of Down syndrome, the most common chromosomal disorder in newborns, has been tracked and analyzed at state and national levels for many years. Many authorities have presumed that, with the increasing utilization of prenatal diagnostic testing, the prevalence of Down syndrome births would decrease. Other authorities, however, have suggested that with births to older women increasing, the prevalence of Down syndrome births would increase.

Previous research in the state of Hawai'i found that, during the twelve-year period 1986-1997, the prevalence of Down syndrome births remained fairly stable at 8.67 per 10,000 unadjusted live births, but the prevalence of Down syndrome births in Hawai'i was also lower than reported in other geographic areas.¹ A national study published by the Centers for Disease Control and Prevention (CDC) in December 2009 examined the prevalence of Down syndrome in children and adolescents 0 to 19 years old living in 10 regions of the United States for the years 1979-2003. In contrast to the Hawai'i data, the national study found that the pooled prevalence of Down syndrome live births had increased by 31% (from 9.0 in 1979 to 11.8 in 2003 per 10,000 live births) with an average increase of 0.9% per year.²

This current study examines data on the prevalence of Down syndrome births in Hawai'i during the years 1997-2005. These data

are compared with the earlier study in Hawai'i and with the national study to answer the question: Has the prevalence of Down syndrome births in Hawai'i been increasing, as found in the 10 regions of the United States?

Background

As prenatal diagnostic tools for disabilities such as Down syndrome have become more sophisticated, women and their partners are presented with difficult decisions. Several studies have explored the impact of prenatal diagnosis on the prevalence of Down syndrome and other chromosomal disorders.³ Researchers found that prenatal diagnosis can have an effect on elective terminations and, consequently, the prevalence of a variety of genetic disorders. Findings from one study suggested that elective terminations due to certain birth defects may affect the prevalence by 50 percent or more.⁴

Questions have arisen regarding the role of genetic counseling in assisting women and their partners as they struggle with this difficult decision. While no published research in Hawai'i has yet addressed this topic, questions arise regarding the kind of information prospective parents are provided. One US mainland study found that, while genetic counseling was helpful, many women said that they were not given information about future quality-of-life issues for persons with disabilities or provided with the positive as well as the negative aspects of giving birth to a child with a disability.⁵ For many of the women who chose to terminate their pregnancy, the decision was affected less by prenatal diagnosis than by their lack of information concerning the quality of life of children with disabilities.

Mothers who chose to continue their pregnancies have expressed dissatisfaction with the information given by their health care providers following a prenatal diagnosis of Down syndrome. A survey of 141 mothers who received such a prenatal diagnosis found mothers who expressed frustration with the process. While satisfied with the medical care they received, the mothers recommended that the diagnosis be conveyed in person, that up-to-date printed materials on Down syndrome be provided, and that mothers be referred to a local Down syndrome support group.⁶

The Disability Rights Movement has become increasingly vocal about elective termination of pregnancies based on a prenatal diagnosis of disabilities like Down syndrome. The movement has called such practices "medical eugenics."⁷ Such groups make a distinction between reproductive rights and disability rights. While reproductive rights may be viewed as "the right to have an abortion," disability rights may be viewed as "the right not to have to have an abortion."⁸ Medical professionals have been accused of failing to communicate correct and unbiased information before and during genetic screening, diagnostic testing, and abortion decision-making. A result is a lack of informed consent and a high abortion rate for fetuses diagnosed with Down syndrome.⁹

The quality of life and opportunities for children born with Down syndrome have increased significantly over the past several decades. Parent advocates cite the potential that children with Down syndrome can lead rewarding and fulfilling lives.¹⁰ Contributing to

this potential is the fact that children with Down syndrome have, over the past two decades, benefited from implementation in 1987 of Part C of the Individuals with Disabilities Education Act, which extended services to infants and toddlers with disabilities. Many of the children who experienced the benefits of early intervention are now educated in inclusive classrooms and have opportunities for post-secondary education. Many young adults with Down syndrome are now employed and tax-paying members of their communities.¹¹ Other young adults with Down syndrome have achieved success in many areas. For example, Chris Burke, a young adult with Down syndrome, has been an award-winning actor in a major television series.¹² Other young adults with Down syndrome marry, and some have established careers in the musical arts.¹³

Whether prospective parents of a child with Down syndrome in Hawai'i are provided with balanced information is uncertain. Few resources have been available to provide such balanced information. To address this lack of resources, the American Academy of Pediatrics developed a tool entitled, "Welcome to Brighter Tomorrows: Supporting Families Receiving a Diagnosis of Down Syndrome." This tool is intended to give pediatricians, family practitioners, geneticists, and related medical practitioners information to adequately support parents and prospective parents who receive this diagnosis. This is a free resource available online at <http://brighter-tomorrows.org>.

Methods

In view of the changes that have occurred in opportunities for children born with Down syndrome, and in response to the national data on the reported increase in prevalence of Down syndrome births, this study examined Hawai'i data to determine if the prevalence of Down syndrome births in Hawai'i has been increasing. The number of Down syndrome births in Hawai'i for the years 1997-2005 was obtained to provide a comparison with data from the earlier study in Hawai'i for 1987-1996 and with the national data for 1979-2003. Additionally, this study was designed to determine if any changes were apparent in the decision to have an elective abortion based on the prenatal diagnosis of Down syndrome compared with decision-making in earlier years.

Data for this study were obtained from the Hawai'i State Department of Health Birth Defects Program and were provided by birth year from 1997 through 2005. The number of Down syndrome

pregnancies and births was recorded by year and examined to identify the number and prevalence of Down syndrome pregnancies and outcomes and births per year. Prevalence was calculated by the number of Down syndrome pregnancies and births per 10,000 births per year in Hawai'i, divided by the number of births.

To determine if the number of pregnancies of babies with Down syndrome was decreasing during this period, the data were analyzed by pregnancy outcomes (terminations, live births, and fetal deaths). The data were further examined by maternal age (younger than 35 years or 35 years and older), and by maternal ethnicity (using the ethnic categories of the Hawai'i State Department of Health Birth Defects Program). To the extent possible, all of the above data were compared with data from the previous study in Hawai'i and with the national study.

In addition to the intellectual and developmental disability sequelae of Down syndrome, the National Institutes of Health (NIH) reported that half of all babies born with Down syndrome have congenital heart defects.¹⁴ The previous prevalence report from Hawai'i did not report the percentage of newborns with Down syndrome who were also identified with congenital heart defects. Therefore, to establish a baseline of published information, the study obtained a frequency count of babies born with Down syndrome who were diagnosed with congenital heart defects.

Results

Prevalence of Down Syndrome Births

Table 1 shows the number of live births and the number of Down syndrome pregnancies for the years 1997-2005. Of 158,790 live births over the nine-year period, 134 babies were identified with Down syndrome at the time of birth. The unadjusted prevalence for the nine-year period was 8.4. The prevalence varied from a low of 5.6 in 2005 to a high of 10.3 in 2002. The total number of Down syndrome pregnancies in Hawai'i over the nine years was 218 and ranged from 16 to 30 per year; the mean was 22.2. The table also shows the outcomes of these pregnancies. The number of pregnancies that ended in fetal death was 14, with the age of one fetal death unknown. During the period covered by this study, the total number of pregnancies terminated after a diagnosis of Down syndrome was 70, ranging from 3 to 11 per year. The mean number of terminations due to prenatal diagnosis of Down syndrome was 7.7.

Table 1. Live Births and Outcomes of Down Syndrome Pregnancies in Hawai'i, 1997-2005							
Year	Live Births	Total Down Syndrome Pregnancies	Outcomes of Down Syndrome Pregnancies				
			Down Syndrome Live Births	Prevalence of Down Syndrome Births	Fetal Deaths <20 Weeks	Fetal Deaths ≥20 Weeks	Terminations
1997	17,419	30	14	8.0	4	1*	11
1998	17,628	30	18	10.2	0	1	11
1999	17,102	26	15	8.8	0	1	10
2000	17,638	26	16	9.1	0	0	10
2001	17,129	20	10	5.8	2	1	7
2002	17,515	22	18	10.3	1	0	3
2003	18,141	18	15	8.3	0	0	3
2004	18,296	30	18	9.8	2	0	10
2005	17,922	16	10	5.6	0	1	5
Total	158,790	218	134	8.4	9	5	70

* The age of one fetal death was unknown

Ratio of Live Births to Terminations

In addition to examining the number of births and terminations, it was of interest to compare the ratio of terminations to births to determine if there was an increasing or decreasing tendency over the years for elective termination. The data in Table 2 show that in no year did the number of terminations equal or exceed the number of live births. The ratio of live births to terminations ranged from a low in 1997 of 1.2 live births to 1 termination to a high of 6 live births to 1 termination in 2002. Data are not available on how many mothers with a live birth had received a prenatal diagnosis that their child would be born with Down syndrome.

Prevalence of Down Syndrome by Age of Mother

Similar to national data, the percentage of births to mothers age 35 or older in Hawai'i has continued to increase. The percentage of births to mothers age 35 or older was 15% in 1997. That percentage had increased to 17.6% in 2005.

Table 3 shows that 64 Down syndrome live births occurred among women under 35 years of age, resulting in a prevalence of 4.8. For women age 35 years or older, there were 70 Down syndrome live births, resulting in a prevalence of 26.5. The prevalence for the older group was 5.5 times higher than for the younger group. These numbers were determined based on the total number of live births to all mothers in each of the two age groups.

Prevalence of Down Syndrome by Ethnicity of the Mother

The study also examined the prevalence of Down syndrome pregnancies by ethnicity of the mother during the 1997-2005 period with data from the earlier study in Hawai'i. Table 4 shows the data. For the current study, the prevalence ranged from a low of just over 8 per 10,000 for African-Americans and Pacific Islanders to a high of 23.9 for Koreans. In the mid-range were Caucasians and Filipinos. Unfortunately, the current study could not compare by ethnicity all the data of the previous study in Hawai'i. For example, the previous study did not include data on African-Americans, and it grouped Chinese, Japanese, and Korean, under one category, "Far East Asian." The previous study did not include data on Vietnamese. Likewise, the previous study grouped Hawaiian and Samoan mothers under one category, "Pacific Islander." Nevertheless, for Caucasians, and Filipinos, the table does show that prevalence of Down syndrome pregnancies in the current study declined from the previous study.

Although the rate of Down syndrome births for Hawai'i continues to be lower than the national rate, how the state's maternal ethnicity composition contributes to this lower rate is unclear. Unfortunately, the available data did not permit an analysis of the data by the birthplace of the mother or by age and ethnicity of the mother.

Prevalence of Down Syndrome by Congenital Heart Defects

The previous study in Hawai'i did not report the percentage of newborns with Down syndrome who were also identified with congenital heart defects. However, data were obtained to determine the percentage of Down syndrome babies born with congenital heart defect over the nine-year period of this study and how those data compared with the NIH estimate that half of Down syndrome babies have a congenital heart defect. The CDC national study reported prevalence, not only of Down syndrome births but also of youth to age 19. Since that report used surveillance data, the data cannot

Table 2. Down Syndrome Live Births and Terminations in Hawai'i, 1997-2005

Year	Births	Terminations	Ratio of Live Births to Terminations
1997	14	11	1.2:1
1998	18	11	1.6:1
1999	15	10	1.5:1
2000	16	10	1.6:1
2001	10	7	1.4:1
2002	18	3	6:1
2003	15	3	5:1
2004	18	10	1.8:1
2005	10	5	1.9:1
Totals	134	70	1.4:1

Table 3. Down Syndrome Live Births by Age of Mother in Hawai'i, 1997-2005. (N=Number; P=Prevalence)

Year	Age of Mother				Totals	
	<35 years of age		≥35 years of age			
	N	P	N	P	N	P
1997	6	4.1	8	30.5	14	8.1
1998	8	5.4	10	35.8	18	10.3
1999	9	6.3	6	21.5	15	8.8
2000	8	5.5	8	26.7	16	9.1
2001	4	2.8	6	20.7	10	5.8
2002	9	6.2	9	31.2	18	10.3
2003	8	5.3	7	22.0	15	8.3
2004	6	3.9	12	38.7	18	9.8
2005	6	4.1	4	12.7	10	5.6
Totals	64	4.8	70	26.5	134	8.4

Table 4. Comparison of Number (N) and Prevalence (P) of Down Syndrome Pregnancies in Hawai'i by Maternal Ethnicity, 1986-1997* with 1997-2005

Ethnicity*	1986-1997		1997-2005	
	N	P	N	P
Caucasian (White)	107	17.6	40	12.6
Black (African American)	(not included)		4	8.4
Far East Asian	92	22.01		
Chinese			11	19.4
Japanese			32	16.7
Korean			7	23.9
Vietnamese	(not included)		2	13.9
Filipino	66	15.94	42	13.8
Pacific Islander	58	9.21		
Hawaiian			37	8.4
Samoan			4	8.2

* Does not include the ethnicity category "All Others"

Table 5. Babies Born with Down Syndrome and Number of These Babies Born with Congenital Heart Defects (CHD) in Hawai'i, 1997-2005

Year	Babies Born with Down Syndrome	Also Born With CHD	
		Number	Percentage
1997	14	12	86
1998	18	11	61
1999	15	11	73
2000	16	13	81
2001	10	7	70
2002	18	13	72
2003	15	12	80
2004	18	14	78
2005	10	7	70
Totals	134	100	75

be compared with the all results reported in this study. However, the results for Hawai'i for 1997-2005 are shown in Table 5. Across the nine-year period, three-fourths of all infants born with Down syndrome were also diagnosed with congenital heart defects; this result is well above the 50% rate stated by the NIH.

Discussion

No definitive trend of either increasing or decreasing prevalence of Down syndrome pregnancies was evident over the nine years of this study. This result (prevalence of 8.4) is similar to the earlier result for Hawai'i, which showed a prevalence of 8.67 per unadjusted live births over a twelve-year period.¹ This stable prevalence over a twenty-one year period is in contrast to findings of the national study that showed a progressive increase in prevalence, with an unadjusted prevalence of 11.8 in 2003.² The prevalence of Down syndrome birth in Hawai'i continues to be lower than the national rate.

Further investigation is necessary to examine why such differences occur. As Hawai'i represents a unique cultural and ethnic composition, further examination is warranted on whether cultural beliefs about raising a child with Down syndrome affect women's decisions to terminate or to continue their pregnancy.

As Table 2 shows, in all years, the number of live births was larger than the number of terminations. The number of terminations was largest in 1997 and 1998 (11 terminations each year). Over the nine years of the study, the cumulative ratio was 1.9 live births to 1 termination. Thus, although with some visible fluctuation, the data show that the number of terminations due to prenatal diagnosis of Down syndrome generally decreased in Hawai'i during the period 1997-2005. Information is not available on whether the apparent decrease in the number of terminations from 2001 (with the exception of 2004) was a result of decisions to carry pregnancies to term or possibly because fewer women received a prenatal testing resulting in a diagnosis of Down syndrome.

In comparison, the previously reported data for Hawai'i found an average ratio of live births to terminations at 1.4:1. These live births included both mothers who received a prenatal diagnosis of Down syndrome and those who did not. The national study did not report information on terminations.

The higher prevalence of Down syndrome births among women age 35 and older is consistent with other studies that suggest that

as women reach the age of 35 and beyond, the prevalence of Down syndrome births rises dramatically. The prevalence in other studies is lower for both age groups than that reported previously in Hawai'i.⁴ For the period of 1987-1996, the prevalence of Down syndrome births for women under 35 was 7.2 in Hawai'i, compared with 4.8 in the current study. For women age 35 or older, the prevalence was 48.3 for the period of 1987-1996, compared with 26.5 in the current study. Therefore, the prevalence of Down syndrome births for both age groups appears to be decreasing.

An additional examination of whether prevalence of Down syndrome births for women 35 and older varies among racial and ethnic populations would be interesting. Also, examining the rates of elective terminations by age group and ethnicity would be helpful. Unfortunately, data were not available to answer these questions at this time.

Comparing these numbers to those previously reported for Hawai'i is challenging.¹ The prevalence as reported by Forester and Metz covered a twelve-year period, whereas the current study covers only a nine-year period. The data for 1997 were included in both studies. And, as noted above, the earlier study divided ethnicity into the following categories: White, Far East Asian, Pacific Islander, and Filipino. Data were not provided for African-Americans. In addition, the earlier study did not delineate aggregates of the categories Far East Asian and Pacific Islander. Thus, the comparisons of prevalence shown in Table 4 must be interpreted with caution.

The national study did not link ethnicity by birth, but by pooled prevalence from birth through age 19. The race/ethnicity categories used were quite different from Hawai'i's. The categories in the national study included Non-Hispanic White, Other, Hispanic, and Non-Hispanic Black. Only two of the categories can be compared with the Hawai'i data. Their pooled prevalence of 10.2 for Non-Hispanic White was lower than Hawai'i's of 12.6. Similarly, the national data of 7.3 for Non-Hispanic Black was slightly lower than Hawai'i's 8.4, even though the number in Hawai'i was quite small.

One finding of considerable interest was the data suggesting that Hawai'i prevalence of congenital heart defects among infants born with Down syndrome is considerably higher than reported by the NIH. While there were fluctuations in percentages across the years, the percentage for each year exceeded the NIH data. Since these data have not previously been reported for Hawai'i, further research is needed to determine why the prevalence of congenital heart defects among babies with Down syndrome may be higher in this state than reported elsewhere.

A survey of Hawai'i's physicians and midwives who deliver babies would be interesting to gather a medical perspective on the kinds of counseling and support services pregnant patients and their partners are provided following a prenatal diagnosis of a child with a disability. Likewise, a qualitative study of women who knowingly give birth to Down syndrome infants each year would be informative to better understanding the circumstances, values, and choices surrounding their decision to continue their pregnancies.

Limitations

A major limitation of the study concerned the limits of available data. As noted previously, earlier studies from Hawai'i were based on data from the Birth Defects Program. In those years, this program was

given an "A" grade from the Pew Environmental Health Commission at the Johns Hopkins School of Public Health and designated as one of the top eight programs in the country, and one of only four programs nationwide to meet all eight rating criteria. Prior to 2006, the Department of Health contracted the program through the Research Corporation of the University of Hawai'i. In 2006, the decision was made to operate the program directly through the Department of Health.

Following that decision, the Birth Defects Program lost most of its staff and has been without a coordinator. Consequently, data for years after 2005 could not be obtained. Similarly, the data that were available were more limited. For example, data were not available on the outcomes following a positive prenatal diagnostic test for Down syndrome. Thus, a comparison with the earlier study on how many mothers chose to terminate and how many mothers chose to continue their pregnancy to term was not possible.

Conclusions

This study found that the prevalence of Down syndrome births for Hawai'i over the past nine years has not changed significantly. This finding is not consistent with the national data showing an increase in prevalence of Down syndrome births. Further studies are needed in Hawai'i to identify what kinds of information and supports are provided to prospective parents when they receive the prenatal diagnosis and how that information may have influenced their decision to terminate or continue the pregnancy. Also important to study is why the Hawai'i data suggest a higher prevalence of congenital heart defects than the national prevalence.

Acknowledgements

This study was undertaken as a special research project by the lead author, a doctoral student in psychology, as part of her post-graduate training in the Maternal-Child Health Leadership in Neurodevelopmental and Related Disorders (MCH-LEND) Program. Appreciation is expressed to Melinda Kohr PhD, the graduate discipline faculty advisor for Ms. McDermott. Mr. Lloyd M. Miyashiro, Research Statistician with the Children with Special Health Needs Branch of the Hawai'i Department of Health, made this study possible through his invaluable assistance with the data. Appreciation is also extended to Robert C. Johnson PhD, for his editorial assistance in preparation of the manuscript.

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References

1. Forrester MB, Merz, RD. Epidemiology of Down syndrome (Trisomy 21), Hawaii, 1986-1997. *Teratology*. 2002;65(5):207-212.
2. Shin M, Besser LM, Kucik JE, Lu C, Siffel C, Correr A. Prevalence of Down syndrome among children and adolescents in 10 regions of the United States. *Pediatrics*. 2009;124(6):1565-1572.
3. Forrester MB, Merz RD, Yoon PW. Impact of prenatal diagnosis and elective termination on the prevalence of selected birth defects in Hawaii. *American Journal of Epidemiology*. 1998;148(12):1206-1211.
4. Forrester MB, Merz RD. Prenatal diagnosis and elective termination of Down syndrome in a racially mixed population in Hawaii, 1987-1996. *Prenatal Diagnosis*. 1999;19:136-141.
5. Roberts CD, Stough LM, Parrish, LH. The role of genetic counseling in the elective termination of pregnancies involving fetuses with disabilities. *The Journal of Special Education*. 2002;36(1):48-55.
6. Skotko BG. Prenatally diagnosed Down syndrome: Mothers who continued their pregnancies evaluate their health care providers. *American Journal of Obstetrics and Gynecology*. 2005;192, 670-77.
7. Saxton, M. Disability rights and selective abortion. In: Davis, L, ed. *Disability Studies Reader*. New York, New York: Routledge; 2006:105-115.
8. Reist MK. *Defiant birth*. Australia: Spinifex Press Party Ltd; 2006:1.
9. Dixon DP. Informed consent or institutionalized eugenics? How the medical profession encourages abortion of fetuses with Down syndrome. *Issues in Law and Medicine*, 2008,24(1):3-59.
10. Roizen, NJ. Down syndrome. In: Batshaw ML, Pellegrino L, Roizen NJ, eds. *Children with Disabilities*. Baltimore: Mryland: Brookes Publishing; 2007:263-273.
11. Center on Disabilities, University of Hawai'i (Producer) (2007). Abilities at work (DVD). Available from <http://cds.hawaii.edu>
12. Christopher Burke. Available at <http://www.imdb.com/name/nm0121630/awards> Accessed July 7, 2010.
13. Sujeet Desai. Available at <http://www.sujeet.com> Accessed July 7, 2010.
14. National Institutes of Health. At http://www.nhlbi.nih.gov/health/dci/Diseases/holes/holes_causes.html Accessed June 20, 2010.

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Artesunate: Investigational Drug for the Treatment of Severe *Plasmodium falciparum* Malaria in Hawai'i

David M. Callender MD and Gunther Hsue MD

Abstract

Introduction: There are hundreds of millions of cases of malaria each year worldwide resulting in a million deaths. These deaths are mostly due to *Plasmodium falciparum*. The only Federal Drug Administration approved treatment for severe malaria is intravenous quinidine gluconate. Intravenous quinidine is increasingly unavailable in the United States. In 2007, the Center for Disease Control and Prevention implemented an investigational new drug protocol to allow the use of intravenous artesunate for cases of severe malaria in the United States. The authors present such a case treated under this protocol at Tripler Army Medical Center, Hawai'i.

Case Report: A 49-year-old man presented to Tripler Army Medical Center, Hawai'i in February 2009 with a one-month history of fever, chills, and weight loss. He recently travelled to multiple malaria endemic areas. Physical examination was significant for fever and prostration. Laboratory studies revealed anemia, thrombocytopenia, and a high parasite load of *Plasmodium falciparum*. A strategic network was activated to obtain and administer intravenous artesunate. His condition rapidly improved as his parasitemia cleared. He was discharged after six days with no adverse medication effects and full recovery upon six-month follow-up.

Discussion: Our patient met the criteria for severe *Plasmodium falciparum* malaria. He was immediately treated with intravenous artesunate and manifested a quick and durable response to therapy. At present, intravenous artesunate is awaiting Federal Drug Administration approval but available via a strategic network controlled by the Centers for Disease Control and Prevention. This case highlights a common delay in diagnosis, importance of optimal prophylaxis, and attention to travel history as they relate to the development of severe malaria.

Introduction

Malaria is endemic to tropical zones and sub-Saharan Africa where 49% of the world's population reside. Worldwide there are 200-300 million infections and 0.7-1 million deaths each year due to malaria. Deaths are mostly due to infection with *Plasmodium falciparum*. In the United States, cases of malaria are uncommon with approximately 1,300-1,500 per year.¹ The vast majority of these cases are imported by travelers from the malaria endemic regions of sub-Saharan Africa and South-Southeastern Asia. Few physicians in the United States have extensive experience with malaria and diagnosis is often delayed.² Approximately 10% of cases in the United States manifest with life-threatening end-organ damage requiring intravenous (IV) treatment. Currently, the only Federal Drug Administration (FDA) approved treatment for severe life-threatening cases is IV quinidine gluconate. Though this drug is efficacious, its timely use is fraught with side effects and limited by supply. In 2007, the Center for Disease Control (CDC) implemented an investigational new drug (IND) protocol to allow the use of IV artesunate for severe *P. falciparum* malaria.³ We present such a case treated under this protocol at Tripler Army Medical Center (TAMC), Hawai'i.

Case Report

A 49-year-old man presented to TAMC, Hawai'i in February 2009 with a one-month history of fevers, chills, night sweats, jaundice,

and weight loss of 30 pounds. He had previously seen multiple primary care providers. He had a working diagnosis of pneumonia and had failed several courses of oral antibiotics. Two months prior, he was deployed on multiple short-term tactical missions throughout Northeast Africa (Djibouti, Ethiopia, Tanzania, and Uganda). Though fairly compliant with chemoprophylaxis, he admits to missing multiple doses of doxycycline. Despite using N,N-Diethyl-meta-toluamide (DEET) repellent spray and wearing permethrin treated uniforms, he was stung by multiple insects while building a marshland bridge.

Physical exam was significant for a temperature of 39.6 degrees Celsius, prostration, and generalized pallor. Abnormal laboratory tests included a hematocrit of 25.1 percent and a platelet count of 26 per millimeters cubed. A blood smear revealed many *P. falciparum* ring forms and a 5-10% parasitemia level (Figure 1). He was immediately hospitalized under unit level of care. Due to the unavailability of IV quinidine, we applied for use of IV artesunate under the CDC's IND protocol. Through a strategic network, IV artesunate was obtained from 1 of 18 national quarantine stations at Honolulu International Airport and delivered to our hospital within hours of application. IV artesunate was administered at 2.4 mg/kg in four equal doses over a three-day period. Our patient's parasitemia rapidly declined to <0.01% within 48 hours.

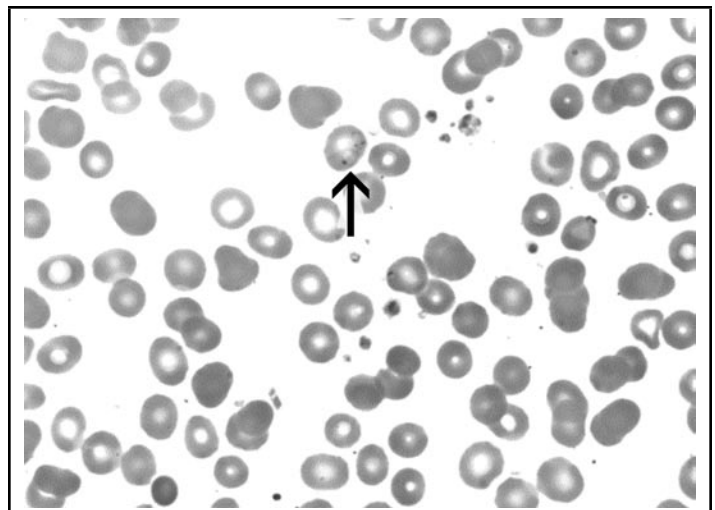


Figure 1. The patient's initial Giemsa stained blood smear. Arrow points towards an erythrocyte with multiple ring forms. This finding coupled with a parasite load of 5-10% is consistent with *P. falciparum*.

Prior to parasitemia clearance, our patient developed worsening thrombocytopenia, anemia, and liver damage. His thrombocytopenia reached a nadir count of 23 per millimeters cubed. He had no associated bleeding and his platelet count recovered to normal levels upon discharge. He demonstrated hemolytic anemia that progressed to a hemoglobin of 5.9 grams per deciliter. He required 2 units of packed red blood cells and hemolysis subsided as his parasitemia

cleared. He developed obstructive and hepatocellular liver damage that improved prior to discharge. He did not develop other severe manifestations such as acute respiratory distress syndrome, acute tubular necrosis, circulatory collapse, or seizures. He tolerated intravenous artesunate without any specific adverse effects. The recommended follow-on oral treatment, atovaquone-proguanil, was given for three days. He was discharged after six days of admission with full clinical recovery upon six-month follow-up.

Discussion

In malaria endemic areas, partial immunity develops after repeated non-clinically significant infections. This immunity wanes rapidly without continuous exposure. The majority of Americans have never or not recently traveled to malaria endemic regions such as sub-Saharan Africa or South-Southeast Asia. In this population of naïve hosts, the body's immune system reacts nonspecifically, rapidly, and very aggressively to *P. falciparum*. Despite a significant travel history, American physicians often overlook malaria for more common diagnoses and 1% of cases ultimately result in death.⁴ Our case demonstrates a delay in diagnosis of malaria despite an obvious history of military endeavors to endemic areas. It further demonstrates that, despite prophylaxis measures, suboptimal compliance places an individual at risk for malaria. In the United States, military personnel represent 1-6% of malaria cases.⁵ The majority of cases are among travelers who have returned to their malarious country of origin to visit friends and relatives (VFR). Similar to our case, surveillance data reveals that VFR travelers are less likely to use optimal prophylaxis. Among the cases of imported malaria by United States citizens, over two-thirds are associated with suboptimal prophylaxis.⁶ These include individuals who took no prophylaxis, non-recommended prophylaxis, or recommended prophylaxis incorrectly as was the case with our patient. Many Hawaiian residents travel to malaria endemic areas and may present similar to our case. Physicians must pay careful attention to travel plans and travel history. They must inform potential VFR travelers that immunity declines rapidly without continuous exposure and prophylaxis is essential when visiting malarious regions.⁷

In both naïve and competent hosts, infection with *P. falciparum* results in non-discriminate release of inflammatory mediators and massive sequestration of erythrocytes in small vessels. The end products of these processes diffusely affect the body's microcirculation resulting in severe end-organ dysfunction.⁸ It is this dysfunction that defines severe malaria (Table 1). This patient developed anemia, thrombocytopenia, and liver damage. We attribute the lack of other manifestation of severe malaria to treatment with IV artesunate. There are no strict criteria for the diagnosis of severe malaria. However, its rapid recognition and treatment are essential.

The FDA approved IV quinidine for treatment of severe malaria in 1991. At that time and through the 1990's it was a widely available and often used class IA antiarrhythmic. Intravenous quinidine was not available in sufficient quantities on the island of O'ahu when our case of severe malaria presented. This is consistent with a national trend as manufacture and distribution of IV quinidine has become progressively limited.⁹ Its use is complicated by prominent cardiotoxicity (profound hypotension, widening QRS interval, and prolongation of QT interval) and the well described syndrome of cinchonism (tinnitus, deafness, and headache). Clinically it has

Table 1. A patient should manifest one of these representative findings to meet the clinical criteria for severe malaria as defined by CDC's IND Protocol 76,725.

Neurological	<ul style="list-style-type: none"> • Impaired consciousness • Seizure
Cardiovascular	<ul style="list-style-type: none"> • Circulatory collapse • Shock
Pulmonary	<ul style="list-style-type: none"> • Pulmonary edema • Acute respiratory distress syndrome
Renal/Electrolytes	<ul style="list-style-type: none"> • Acute renal failure • Acidosis
Hematological	<ul style="list-style-type: none"> • Abnormal bleeding • Disseminated intravascular coagulation • Severe anemia (Hgb < 7 g/dL)
Gastrointestinal	<ul style="list-style-type: none"> • Jaundice • Liver damage

Table 2. The use of IV artesunate via IND Protocol 76,725 requires at least one bullet from all three categories. The asterisks demonstrate the criteria met in our case.

1. Malaria confirmation	<ul style="list-style-type: none"> • <i>P. falciparum</i> confirmed by microscopy* • Undetermined but strong clinical suspicion
2. IV treatment desired	<ul style="list-style-type: none"> • High density parasitemia (>5%)* • Unable to take oral medications • Severe malaria (seizures, shock, ARDS, DIC, Hgb<7 g/dL, etc.)*
3. Artesunate desired	<ul style="list-style-type: none"> • Availability (greater than or equal to IV quinidine)* • Quinidine failure (parasitemia >10% 48h) • Quinidine intolerance (QRS/QTc >50%/25%, persistent hypotension) • Quinidine contraindication (allergy, LBBB, digitalis toxicity, myasthenia gravis)

Table 3. The FDA and non-FDA approved treatment options available in the United States for severe malaria.

IV quinidine (plus 1/3 below)	6.25 mg/kg IV over 1-2 hrs, then 0.0125 mg/kg/min continuous >24 hours followed by doxycycline, tetracycline, or clindamycin
doxycycline	100 mg po bid x 7 days
tetracycline	250 mg po qid x 7 day
clindamycin	20 mg/kg po tid x 7 days
IV artesunate (plus 1/3 below)	2.4 mg/kg bolus T0, 12, 24, 48 IV followed by atovaquone-proguanil, doxycycline, or mefloquine
atovaquone-proguanil	1000-400 mg po x 3 days
doxycycline	100 mg po bid x 7 days
mefloquine	750 mg po x 1 then 500 mg po after 6-12 hours
Exchange transfusion	>10% parasitemia, continue until <1%

largely been replaced by newer antiarrhythmic drugs.¹⁰ Intravenous artesunate has no specific side effects and has been used worldwide over the last decade for treatment of severe malaria. Though not FDA approved, it is readily available for prompt and efficacious administration via a strategic network controlled by the CDC.

If clinical suspicion is high for severe malaria a physician should contact the CDC's Malaria Hotline (770-488-7788 during normal business hours; 770-488-7100 after hours). IND protocol eligibility

is determined by meeting criteria regarding diagnosis, necessity for intravenous administration, and desirability of artesunate compared to quinidine (Table 2). Once deemed eligible, intravenous artesunate is then released free of charge from one of eighteen quarantine stations located throughout the United States.¹¹ There is a quarantine station located on the island of Oahu at the Honolulu International Airport. From initial contact with the CDC, IV artesunate was administered to our patient within five hours. This is comparable to a reported seven-hour average time till administration of artesunate from other CDC quarantine stations.¹²

Artesunate is historically rooted in the sweet wormwood plant, *Artemisia annua*. Sweet wormwood resembles a fern and is native to Asia. Since antiquity it has been known to the Chinese as gingham and used in traditional medicine. In the second century, the Jin Dynasty documents its use against fevers, the most common manifestation of malaria. In the mid twentieth century, Chinese scientists began extracting malaria-active substances from plants under a military antimalaria initiative, Project 523.¹³ From gingham, an active substance was derived and provided the foundation for a novel class of compounds named artemisinins. Through the mid 1980's, this work remained largely unknown to the world until its use was published medically.¹⁴ Since then, multiple artemisinins have been extracted and chemically synthesized worldwide. This process culminated in a parenteral version, artesunate, effective against severe malaria. Intravenous artesunate is superior to IV quinidine and is considered first line treatment for severe malaria worldwide.¹⁵ Since 2007, the CDC's version of IV artesunate has been filling a void in the FDA approved treatments for severe malaria. Intravenous artesunate is administered in four 2.4 mg/kg boluses over three days. IV artesunate has a short half-life and rapid action against all stages of the *P. falciparum* life cycle.¹⁶ Durability of treatment is ensured with a longer acting follow-on oral regimen of atovaquone-proquanil, doxycycline, or mefloquine (Table 3). In addition to IV artesunate, Table 3 presents the other two treatment options available in the United States for severe malaria.¹⁷

This case highlights a common delay in diagnosis, importance of optimal prophylaxis, and necessity for careful attention to travel history as each relate to the development of severe malaria. Most importantly, it introduces intravenous artesunate, a medication uncommon to the armamentarium of many Hawai'i physicians. Worldwide this medication is essential for the treatment of severe malaria. Physicians need to be familiar with the process to obtain and administer this currently non-FDA approved medication. Through this process, we have demonstrated that intravenous artesunate is now an efficacious and well-tolerated treatment for severe cases of *P. falciparum* malaria in Hawai'i.

The views expressed in this article 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 United States Government. The authors are not financially supported by the Centers for Disease Control and Prevention, Walter Reed Army Institute of Research, or Knoll Pharmaceuticals.

The authors report no potential conflicts of interest relevant to this article.

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References

1. Aregawi M, Cibulskis R, Williams R, Dye C. Geneva, Switzerland: World Health Organization; 2009. *World Malaria Report 2009*.
2. Kortepeter M, Brown J. A review of 79 patients with malaria seen at a Military Hospital in Hawaii from 1979 to 1995. *Military Medicine*. 1998;163:84-9.
3. Centers for Disease Control and Prevention. New medication for severe malaria available under an investigational new drug protocol. *Morbidity and Mortality Weekly Report*. 2007;56:769-770.
4. Newman R, Parise M, Barber A, Steketee R. Malaria-related deaths among U.S. travelers, 1963-2001. *Annals of Internal Medicine*. 2004;141:547-555.
5. Armed Forces Health Surveillance Center. Update: malaria, U.S. Armed Forces, 2008. *Medical Surveillance Monthly Report*. 2009;16(1):8-11.
6. Centers for Disease Control and Prevention. Malaria Surveillance --- United States, 2008. *Morbidity and Mortality Weekly Report*. 2010;59(SS07):1-15.
7. Fulford M, Keystone J. Health risks associated with visiting friends and relatives in developing countries. *Current Infectious Disease Reports*. 2005;7:48-53.
8. Mackintosh C, Beeson J, Marsh K. Clinical features and pathogenesis of severe malaria. *Trends in Parasitology*. 2004;20:597-603.
9. Yang F, Hanon S, Lam P, Schweitzer P. Quinidine revisited. *The American Journal of Medicine*. 2009;122(4):317-321.
10. Griffith K, Lewis L, Mali S, Parise M. Treatment of malaria in the United States: a systematic review. *Journal of the American Medical Association*. 2007;297:2264-276.
11. Centers for Disease Control and Prevention. Intravenous artesunate for treatment of severe malaria in the United States. *IND Protocol #76,725*. 2007;1-48.
12. Arquin P. Artesunate for Malaria. *New England Journal of Medicine*. 2008; 359:313-315.
13. Zhang J. *A detailed chronological record of Project 523 and the discovery and development of qinghaosu (artemisinin)* Vol. 193. Yangcheng Evening News Publishing Company; China: 2005.
14. Klayman D. Qinghaosu (artemisinin): an antimalarial drug from China. *Science* 1985;228:1049-1055.
15. Dondorp A, Nosten F, Stepniewska K, Day N, White N. Artesunate versus quinine for treatment of severe falciparum malaria: a randomized trial. *Lancet*. 2005;366:717-725.
16. Rosenthal P. Artesunate for the treatment of severe falciparum malaria. *The New England Journal of Medicine*. 2008;358(17):1829-1836.
17. World Health Organization. Guidelines for the Treatment of Malaria. 2006. WHO Press, Geneva, Switzerland. (Accessed May10 2010, at <http://www.who.int/malaria/docs/TreatmentGuidelines2006.pdf>).

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Gastric Volvulus, Borchardt's Triad, and Endoscopy: A Rare Twist

Anthony P. Cardile DO and David S. Heppner DO

Abstract

The authors describe a case of gastric volvulus, which is a rare cause of gastric outlet obstruction. An 85-year-old man presented with nausea, vomiting, and epigastric pain. Admission abdominal radiograph demonstrated a grossly distended stomach with air-fluid levels. Multiple attempts at nasogastric tube placement failed. Endoscopy revealed a fluid-filled, tortuous stomach with a paraesophageal hernia, and the operator was unable to locate or pass the scope through the pylorus. Traditionally Borchardt's triad is believed to be diagnostic for acute gastric volvulus and consists of unproductive retching, epigastric pain and distention, and the inability to pass a nasogastric tube. The authors propose that the following features on endoscopy are highly suggestive of the most common type of volvulus (organoaxial): tortuous stomach, paraesophageal hernia, and inability to locate or pass the scope through the pylorus.

Introduction

Gastric volvulus is rare and its incidence is not well defined in the literature. It is rotation of the stomach more than 180 degrees creating a closed loop obstruction.¹ This condition can be primary or secondary, with secondary volvulus due to paraesophageal hernia being more common. Secondary volvuli in the adult are most commonly due to paraesophageal hernias and the peak incidence occurs in the fifth decade of life.¹⁻⁴ Approximately 20% of gastric volvulus cases occur in infants under 1 year of age and are often secondary to congenital diaphragmatic defects.²

There are three anatomic types: organoaxial, mesenteroaxial, and a combination of both. Organoaxial volvulus is caused by rotation along the longitudinal cardiopyloric axis.² This is the most common type, accounting for two-thirds of cases, and is usually associated with diaphragmatic defects, most commonly a paraesophageal hernia. Organoaxial volvulus is far more common than mesenteroaxial volvulus and a combination of both. Mesenteroaxial volvulus occurs when torsion occurs around the transverse axis of the stomach.² Distinction between types is not crucial as the classification is more descriptive than prognostic.¹

This condition may present as an acute abdominal emergency or a chronic cause of upper abdominal discomfort. Borchardt's triad is believed to be diagnostic for acute gastric volvulus and consists of unproductive retching, epigastric pain and distention, and the inability to pass a nasogastric tube.⁵ Carter et al suggest three additional findings that may be very suggestive of gastric volvulus: minimal abdominal findings when the stomach is in the thorax; a gas-filled viscus in the lower chest or upper abdomen on chest radiograph, especially when associated with a paraesophageal hernia; and obstruction at the site of the volvulus shown by upper gastrointestinal (GI) series.⁶ Mortality from acute gastric volvulus has been reported to be as high as 30–50%.⁷ As a result, quick recognition and prompt surgical correction remain key in therapy for acute gastric volvulus.²

Thus, although a rare diagnosis, primary care providers and emergency room physicians should be aware of the tell-tale signs of gastric volvulus in a patient with a gastric outlet obstruction. In addition, endoscopists should be cognizant of endoscopic features

that are suggestive of this diagnosis. Based on our experience with the case described below we propose that the following features on endoscopy are highly suggestive of the most common type of volvulus (organoaxial): tortuous stomach, paraesophageal hernia, and inability to locate or pass the scope through the pylorus.

Case Report

An 85-year-old man presented with nausea, vomiting, and abdominal pain ten to fifteen minutes after eating. Past medical history included coronary artery disease, congestive heart failure (ejection fraction of 15%), automated implantable cardioverter-defibrillator placement, and chronic kidney disease. Review of systems revealed a forty pound weight loss and early satiety over the past six months. Physical exam was significant for a firm, distended abdomen, decreased bowel sounds, and epigastric tenderness. Admission abdominal film demonstrated a grossly distended stomach with air-fluid levels (Figure 1). Admission laboratories were unchanged from baseline. CT scan of the abdomen/pelvis confirmed stomach distention with air-fluid levels consistent with gastric outlet obstruction. There was no obstructing mass or stone noted on CT scan.

The patient was made NPO, and two attempts at nasogastric tube placement failed. Gastroenterology was consulted and placed a nasogastric tube endoscopically over a wire. Endoscopy revealed a fluid-filled, tortuous stomach with a paraesophageal hernia (Figure 2). The operator was unable to locate or pass the scope through the pylorus. There were multiple necrotic/superficial ulcerative lesions (Figure 3) and biopsy revealed acutely inflamed gastric mucosa with focal, necrotic luminal material. An upper GI series was consistent



Figure 1. Admission KUB revealing a grossly distended stomach with air fluid levels, typical of gastric volvulus.



Figure 2. Upper GI Endoscopy in retroflexion view revealing a paraesophageal hernia and retained stomach contents.

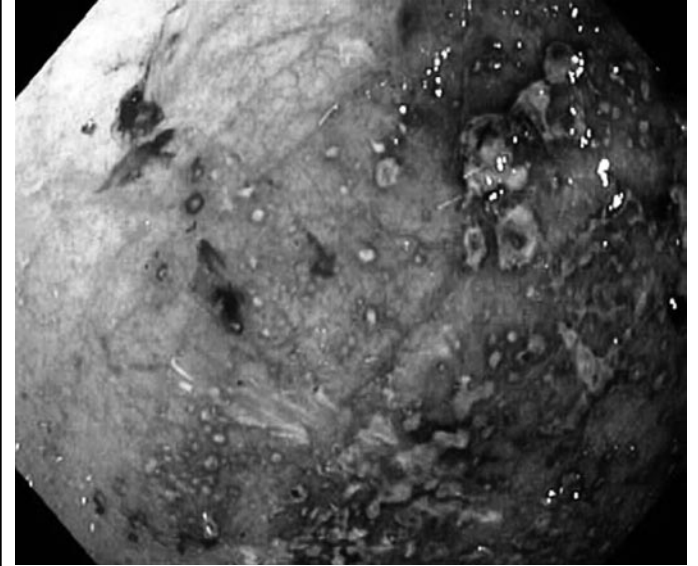


Figure 3. Upper GI Endoscopy revealing diffuse gastritis and necrotic lesions.

with gastric volvulus and a paraesophageal hernia of the duodenum. General surgery scheduled the patient for laparoscopic repair and he was placed on total parenteral nutrition. The evening prior to surgery he developed a non-ST segment elevation myocardial infarction, with echocardiogram revealing marked right wall motion abnormality with posterior wall akinesis. He was transferred to the ICU and was medically managed, but developed a hemodynamically significant upper GI bleed. The patient and his family decided to pursue hospice care given his serious condition.

Discussion

Gastric volvulus may present as an acute abdominal emergency or a chronic cause of upper abdominal discomfort. Borchardt's triad is believed to be diagnostic for acute gastric volvulus and consists of unproductive retching, epigastric pain and distention, and the inability to pass a nasogastric tube.⁵ Acute volvulus can cause gastric infarction leading to GI hemorrhage, acute cardiopulmonary distress, or shock.¹ Chronic volvulus is characterized by upper abdominal discomfort similar to peptic ulcer disease, gastritis, cholecystitis, chronic pancreatitis, or angina pectoris.⁹ Chronic volvulus can spontaneously reduce by the time of evaluation, leading to delay in diagnosis and treatment.⁹

Radiographic findings include herniation of the stomach above the diaphragm, with differential air fluid levels.⁸ Upper GI series is usually diagnostic and can define the anatomical type of volvulus. CT scan can help confirm the rotation of the herniated stomach and the transition point.⁸ Endoscopic diagnosis can reveal a tortuous appearance of the stomach and difficulty or inability to reach the pylorus.⁹

Acute volvulus requires immediate surgery to prevent vascular compromise. The preferred procedure is anterior gastropexy in which the greater curve of the stomach is fixed to the undersurface of the anterior abdominal wall.¹ Endoscopic reduction has been reported but does not address the underlying pathology that predisposes to torsion of the stomach.¹

This case illustrates the importance of primary care and emergency room physicians in being aware of the utility of Borchardt's triad in the diagnosis of gastric volvulus. In addition, this case emphasizes the role of upper endoscopy in the diagnosis of gastric volvulus. This entity was not part of our initial differential diagnosis until we performed endoscopy. Other authors have noted that endoscopic diagnosis can reveal a tortuous appearance of the stomach and difficulty or inability to reach the pylorus.^{1,9} Based on our experience with this case, the following features on endoscopy are highly suggestive of the most common type of gastric volvulus (organoaxial): tortuous stomach, presence of a paraesophageal hernia, and inability to locate or pass the scope through the pylorus. If paraesophageal hernia is absent, we cannot definitively state mesenteroaxial volvulus alone or in combination with organoaxial volvulus cannot be present. Thus, this work should serve as a hypothesis generating paper and such criteria would need further study for validation at a large center that sees gastric volvulus with more frequency.

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 Statement

The authors have no disclosures.

Funding

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

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References

1. Wasselle JA, Norman J. Acute Gastric Volvulus: Pathogenesis, Diagnosis, and Treatment. *Am J Gastroenterol.* 1993;88(10):1780-4.
2. Godshall D, Mossallam U, Rosenbaum R. Gastric volvulus: case report and review of the literature. *J Emerg Med.* 1999 Sep-Oct;17(5):837-40.
3. Tanner CN. Chronic and recurrent volvulus of the stomach. *Am J Surg* 1968;115:505-515
4. Singleton AC. Chronic gastric volvulus. *Radiology* 1940; 34:53-61
5. Johnson JA, Thompson AR. Gastric Volvulus and the Upside-down Stomach. *J Miss State Med Assoc.* 1994;35(1):1-4.
6. Carter R, Brewer LA, Hinshaw DB. Acute gastric volvulus. A study of 25 cases. *Am J Surg* 1980;140:99-104.
7. Smith RJ. Volvulus of the stomach. *JAMA* 1983;75:393-6.
8. Peterson CM, Anderson JS, Hara AK, Carezza JW, Menias CO. Volvulus of the Gastrointestinal Tract: Appearances at Multi-modality Imaging. *Radiographics.* 2009;29(5):1281-93.
9. Schaefer DC, Nikoomehesh P, Moore C. Gastric Volvulus: An Old Disease Process with some new twists. *Gastroenterologist.* 1997;5(1):41-5.

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Harnessing Technology for a 21st Century Medical Education

**Joseph W. Turban MD; Associate Director, SimTiki, Telehealth Research Institute;
John A. Burns School of Medicine (JABSOM), University of Hawai'i**

Introduction

Since the turn of the 21st century remarkable technological advances have touched nearly every facet of everyday life. Multiple aspects of the delivery of medical care have been improved, from digital imagery to electronic medical records. At JABSOM, new technologies are being harnessed in medical education to produce modern, effective physicians for the new millennium.

SimTiki, The Simulation Center at JABSOM

As detailed previously,¹ SimTiki, the simulation center at JABSOM, began in 2007. Students experience simulated patient encounter, beginning in the first month of medical school through Senior Seminars, the final rotation prior to commencement. SimTiki provides the medical students a safe, effective environment to practice advanced medical scenarios, supported by high fidelity, state-of-the-art manikins. They may then receive feedback on their performance via a "video debrief," an audio and video playback that records the scenario in real time.

The most effective learning through simulation utilizing manikins is via small groups. This makes scheduling of an entire class, currently numbering in the high 60s, challenging and labor intensive, since it requires 12-13 instructor man-hours to facilitate a scenario using the typical tutorial group, consisting of 5-6 students. Although this represents a substantial investment in faculty time, this difficulty is offset by the unique experiences provided by simulation. Student feedback has been overwhelmingly positive; surveyed student responses include "Excellent teaching tool," "Great! Great! Great! It brings learning to life," and "I strongly believe this is the best way to understand what we've been learning."

The Audience Response System (ARS)

Audience Response Systems (ARS) incorporate a computer-based program integrated with a hand held device containing a numerical keypad, commonly referred to as a "clicker." Typically, a multiple-choice question is posed through a slide show presentation and the audience responds, anonymously, using the clickers. This system has multiple applications in education. Instructors may utilize ARS to query the group as to their understanding of a particular topic, to test retention of factual information shared during the lecture, as a means to focus the audience on important points, and to increase participation and attendance. The audience can also be polled as to their opinions regarding a particular issue. The ARS has also been used in 3rd year colloquium as part of an ethics course, to survey how the class would respond to a potential ethical dilemma. The responses of the students would guide the discussion to follow.

ARS can be used for course and lecture evaluations. Research has shown a higher response rate for course evaluations utilizing ARS versus a standardized paper format.²

ARS has been shown to encourage active participation, enhance student learning and retention, and increase attendance.³⁻⁶ Students like using ARS as they feel it enhances learning, improves retention, allows active participation, is anonymous, and, as such, feel more comfortable using this modality to express unpopular views.^{3,5,7,8} Instructors receive better evaluation when using ARS as compared to similar lectures given without using ARS.⁹

JABSOM students expressed a preference for utilizing ARS. Eighty-two percent of students agreed or strongly agreed with the statement "We should use ARS more..." When asked which format they preferred to use for evaluation, 299/367 (81%; 95%CI 77-85%) responded "ARS," as compared to "paper format," "weren't sure," or had "no opinion" (unpublished data).

Each clicker costs \$75, and it can be somewhat laborious transporting, distributing, then collecting and counting to ensure all clickers are returned at the completion of the event.

Digital Imaging

An exciting new endeavor in the preclinical years at JABSOM entails incorporating digital imagery into the Problem Based Learning (PBL) process. Much of the medical education of the first two years centers on the PBL tutorial group. Rather than courses in discrete disciplines of medicine, such as anatomy, physiology, pharmacology and biochemistry, PBL is centered on Health Care Problems (HCPs) that incorporates aspects of these disciplines. An HCP is shared with the group via written pages, through which the case unfolds. For example, the first page may contain the chief complaint, at which time the students would generate hypotheses. The next page may be the history of present illness, and the students refine their hypotheses, and so on, through the physical exam, and any laboratory data and radiological studies. Commencing the 2010-11 academic year, digital imagery depicting the radiographic studies will be a part of the cases, instead of being confined to a description on paper. Students will be able to view the actual study, which will enable a much more powerful learning experience.

A similar type of application soon to be implemented is the video tutorial, which incorporates a slide show with a recorded voice file. The instructor has the option of including a window containing a video of the lecturer speaking. A content expert, such as a radiologist, could audio-visually record his interpretation of the radiographic study, or even give a tutorial, such as on how to interpret a chest X-ray. Such technology could help bridge the geographical gap between the classroom at the medical school Kakaako Campus, and the expert faculty at their various clinical locations.

JABSOM Biomedical Organization Web System (JBOWS); A Multimedia Information Management System

This system provides a portal through which students and faculty may access curricular material and other health and administrative information, including PowerPoint lecture slides, documents, schedules, and a vast array of other related educational materials. Administrative committee meeting minutes are also posted on JBOWS.

As part of the tutorial process of working through the HCPs, students generate Learning Issues (LIs), curricular content specific to that particular case, and in conjunction with the overall unit objectives. These LIs are researched and shared within the group at subsequent tutorials. The LIs that comprise the knowledge basis of the HCP are considered Fair Game LIs, and the students are responsible for this content at their end unit evaluations. JBOWS provides both the platform to post, as well as the reference of these Fair Game LIs.

The future role of JBOWS will be expanded, perhaps in conjunctions with other modalities, which are detailed further.

E*Value®, a web-based schedule optimization software, is used to organize third year clerkship and 4th year rotations. It utilizes an optimization algorithm, wherein students enter their preferences for a rotation schedule. The software optimizes and creates a schedule based on predetermined weighting criteria. E*Value has also been utilized at other medical schools as a web and PDA based instrument to track procedures and other requirements of matriculation, productivity assessment, evaluations, and to accumulate this information easily for accreditation agencies.

In addition, plans are being made to use Lecture Capture Technology (LCT) in the future. In anticipation of an increase in the class size at JABSOM, multiple locations will be used simultaneously; indeed, some students are currently based in Hilo*. LCT capabilities permit capture of lectures, complete with slides, to JBOWS within seconds of being completed. Additionally, even though the curricular time may be filled to capacity, LCT allows important information to be made available to students, which can be accessed at their convenience. LCT would also allow students to tap lecture material that otherwise may not be available, in instances where faculty would be unable to make conventional lecture times due to time constraints, room unavailability, or scheduling conflicts.

T-Res® is being utilized in the clinical years as a tracking software that utilizes the Web or hand held devices. Its application records procedures, experiences, and evaluations efficiently and effectively. Also, as accreditation agencies become more rigorous in their requirements, an efficient tracking software affords program directors and faculty evaluators a valuable time-saving tool to document compliance. It helps develop a more uniform learning experience across student populations. Students can directly enter successful procedures, such as LPs, central line placement, and even H and Ps straight from their hand held platforms, be it a BlackBerry, iPhone, or a Palm.

Conclusion

Advances in informational and educational technologies are opening exciting opportunities for medical educators at JABSOM. These advances enable faculty to develop state-of-the-art modalities to further the educational experiences of medical students. As technology continues to advance, JABSOM will continue to explore ways to be on the cutting edge to provide medical students the best possible medical education.

**Hilo is a city on the island of Hawaii, 210 miles southeast of the medical school campus in Honolulu.*

Acknowledgement

The author wishes to acknowledge the assistance of Grant Murata, Development Manager, Office of Information Technology, JABSOM; Sarah Hsiao, Education-Technology Specialist, Office of Medical Education, JABSOM; and Noelani Ching, Education Specialist, Office of Medical Education, JABSOM, in the preparation of this article.

References

1. Turban JW. "The Role of Simulation at JABSOM." *Hawaii Med J.* 2009;68:286-7.
2. Turban JW. "Audience Response System—a modality for course evaluation." *Med Educ.* 2009 May;43(5):488-9.
3. Uhari M, Renko J, Soini H. Experiences using an interactive audience response system in lectures. *BMC Med Educ* 2003;3(12): 1-6.
4. Preszler RW, Dawe A, Shuster CB, Shuster M. Assessment of the effects of student response systems on student learning and attitudes over a broad range of biology courses. *CBE Life Sci Educ.* 2007 Spring;6(1):29-41.
5. Pradhan A, Sparano D, Ananth CV. The influence of an audience response system on knowledge retention: an application to resident education. *Am J Obstet Gynecol.* 2005 Nov;193(5):1827-30.
6. Gauci SA, Dantas AM, Williams DA, Kemm RE. Promoting student-centered active learning in lectures with a personal response system. *Adv Physiol Educ.* 2009 Mar;33(1):60-71.
7. Caldwell JE. Clickers in the large classroom: current research and best-practice tips. *CBE Life Sci Educ.* 2007 Spring;6(1):9-20.
8. Schackow TE, Chavez M, Loya L, Friedman M. Audience response system: effect on learning in family medicine residents. *Fam Med.* 2004 Jul-Aug;36(7):496-504.
9. Cain J, Black EP, Rohr J. An audience response system strategy to improve student motivation, attention, and feedback. *Am J Pharm Educ.* 2009 Apr 7;73(2):21.

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Life After Cancer Treatment: Caring for Cancer Survivors

Francisco A. Conde PhD and Andrea Wilburn; Department of Oncology, Queen's Medical Center

Due to advances in early detection, cancer treatments, and supportive care, the population of cancer survivors has been rising steadily during the past several decades in the United States. Today, it is estimated that there are over 11 million cancer survivors, which represent about 4% of the total population.¹ The National Cancer Institute defines survivors as individuals who have been diagnosed with cancer from the time of diagnosis through the balance of their lives. Family members, friends, and caregivers are included in this definition because they are also affected by the cancer experience.

For many cancer survivors, the diagnosis of cancer is a life-altering event, and the end of treatment is a moment of celebration. However, treatment completion does not mean that their cancer experience is over. Numerous research studies have outlined the unique health, economic, and employment issues faced by cancer survivors as a result of their cancer and its treatment. Many cancer survivors report having persistent symptoms, such as fatigue, pain, cognitive impairment, decreased functional ability, and changes in sexuality and sexual function. Survivors are also at risk for developing late effects of treatment, such as osteoporosis and secondary malignancies. They experience varying degrees of psychological distress, including anxiety, worry, uncertainty, and fear of cancer recurrence. Financially, survivors may have trouble paying or are unable to pay for medical bills, prescription drugs, medical devices, and supplies. Many cancer patients are able to work while on treatment, and the majority who worked prior to their diagnosis return to work upon completion of their treatment. However, about 20% of survivors have work limitations 2 to 3 years after their diagnosis. These physical, psychosocial, emotional, and economic distresses can negatively affect the overall quality of life of cancer survivors.

To meet the special needs of cancer survivors, the 2006 Institute of Medicine (IOM) report, "From Cancer Patient to Cancer Survivor: Lost in Transition," recommends that all patients completing their cancer treatment and their primary care providers be given an individualized cancer survivorship care plan (CSCP).² This care plan would include a summary of their diagnosis and treatment; surveillance for recurrence or second cancer; information on the short-, long-, and potential late effects of cancer and its treatment; community resources; and recommendations for preventive and health maintenance interventions. The CSCP could serve as a blueprint for future care. Recently, the Commission on Cancer and the National Accreditation Program for Breast Centers of the American College of Surgeons have adopted the IOM's recommendation by creating a new quality measure requiring accredited cancer centers to implement and disseminate a CSCP as part of the standard of care for all cancer patients.

The Queen's Medical Center Survivorship Program

The Queen's Medical Center (QMC) is a nonprofit 501(c)(3) hospital, and is Hawai'i's largest private hospital and the leading medical

referral center in the Pacific Basin. QMC provides cancer care to approximately 36% of cancer patients in Hawai'i and is one of 30 sites nationwide participating in the National Cancer Institute Community Cancer Centers Program (NCCCP). With funding from the Hearst Foundation, QMC launched its Cancer Survivorship Program in 2009. It is the first and only adult cancer survivorship program in Hawai'i. The program's goal is to enhance the quality of life of cancer survivors, as well as address the short- and long-term effects of cancer and its treatment. The program was initially piloted with breast cancer survivors, but soon expanded to other cancer types, including prostate, lung, ovarian, and colorectal cancers.

The survivorship program is offered free for QMC and non-QMC cancer survivors. To provide individualized survivorship care, survivors meet one-to-one with an advanced practice survivorship nurse. Family members, friends, and caregivers are welcomed to attend the meeting. In concordance with the IOM's recommendation that a CSCP be given to survivors who have completed their primary cancer treatment, survivors are provided with printed CSCP using a web-based oncology-specific survivorship software. The CSCP includes diagnosis and treatment summaries, schedule of follow-up care and appropriate tests based on the National Comprehensive Cancer Network (NCCN) guidelines, contact information of providers, and educational information on side effects, community resources, and health promotion, such as cancer screening, smoking cessation, and physical activity. Survivors are encouraged to give a copy of their CSCP to their primary care physician.

In addition to developing and printing individualized CSCP, the survivorship software has an automatic patient appointment reminder system. Once the user is logged in, a list of survivors who are due or are overdue for an appointment appears on the computer screen. Survivors on the list are then contacted by phone and mail to remind them of their appointment. The automatic appointment reminder system helps ensure that survivor follow up and monitoring are completed, thus reducing the number of survivors "lost to follow up."

The survivorship staff collaborates with other QMC programs to assist survivors with other issues related to their care. The patient navigators can arrange transportation to and from their follow-up appointments and coordinate travel for patients from neighbor islands if needed. The financial resource advocates at QMC help survivors who are uninsured, underinsured, or those who cannot afford to pay for high-cost prescription drugs. The oncology social worker aids survivors with psychosocial issues, such as feelings of anxiety, worry, uncertainty, and fear. Survivors often have questions about diet after treatment, and they can attend a nutrition class or meet with a dietitian.

In 2010, with funding from the Hawai'i-Affiliate of the Susan G. Komen Foundation, QMC is able to offer the survivorship program to cancer survivors residing in Moloka'i using video teleconferencing (VTC) technology. Survivors in Moloka'i face issues related to

Table 1. Demographic Characteristics of Survivors Seen at the Queen's Cancer Survivorship Program.		
	Number	Percentage
Ethnicity		
Japanese	57	29%
Caucasians	40	20%
Native Hawaiians	36	18%
Filipinos	24	12%
Chinese	5	3%
Other	36	18%
Cancer Site		
Breast	163	82%
Lung	11	6%
Prostate	4	2%
Colorectal	4	2%
Gynecologic malignancies	3	1.5%
Hematologic malignancies	3	1.5%
Island		
O'ahu	178	90%
Moloka'i	14	7%
Maui	2	1%
Kaua'i	2	1%

healthcare access, such as finances, insurance coverage, and geography. The average round-trip air travel cost for one person from Moloka'i to O'ahu may range from \$100 to \$280. If costs for ground transportation, lodging, and if accompanied by another person are added to air travel costs, total travel expenses for follow-up visits could be very costly. Most health insurance covers treatment-related travel, but not for travel after survivors have completed their cancer treatment. While air travel from Moloka'i to O'ahu is only about 20 minutes, survivors can spend an entire day shuffling from home to airport, airport to the hospital or clinic, and back. Long travel time places a burden on survivors who may be experiencing pain, fatigue, urinary and/or bowel incontinence, and physical disabilities. Thus, through the use of VTC, access issues related to time, finances, and geography are reduced, and cancer survivors in Moloka'i now have access to comprehensive survivorship care and support regardless of insurance coverage. Other sources of funding are currently being sought in order to offer the survivorship program to other neighbor islands.

From June 1, 2009 to January 31, 2011, the Queen's Cancer Survivorship Program has seen 198 cancer survivors. As shown in Table 1, the mean age of the survivors seen in the program was 61 years of age, and majority were Japanese, followed by Caucasians, Native Hawaiians, and Filipinos. Most had a breast cancer diagnosis (82%) and were from the island of O'ahu (90%).

Cancer survivorship is a distinct phase of the cancer continuum. Care is focused on surveillance and promoting health. According to Lynn, a breast cancer survivor from Mililani, "It (QMC survivorship program) is a good way to take a deep breath, review and look to the future. It is so easy for people to fall through the cracks and this program helps cancer patients reflect and move forward." For more information about the QMC Cancer Survivorship Program, please call 808-545-8914.

Supported by funds from the Hearst Foundation, Hawai'i-Affiliate Susan G. Komen Foundation, National Cancer Institute Community Cancer Centers Program (NCCCP), and the Native Hawaiian Health Program.

References

1. Altekruse SF, Kosary CL, Krapcho M, Neyman N, Aminou R, Waldron W, Ruhl J, Howlander N, Tatalovich Z, Cho H, Mariotto A, Eisner MP, Lewis DR, Cronin K, Chen HS, Feuer EJ, Stinchcomb DG, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2007, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2007/, based on November 2009 SEER data submission, posted to the SEER web site, 2010.
2. Hewitt, M., & Ganz, P.A. (Eds.) (2006). *From Cancer Patient to Cancer Survivor – Lost in Transition*. Washington, D.C.: The National Academies Press.



❖ FOR EVERY ACTION THERE IS AN EQUAL AND OPPOSITE GOVERNMENT PROGRAM.

In 1998 the US tobacco companies entered into an agreement with 46 states' attorneys general to pay \$206 billion over the next 25 years for recovery of tobacco related health-care costs. Similar to Hawai'i, the state of Ohio established a Tobacco Use Prevention and Cessation Trust Fund. In 2008, the governor of Ohio announced a plan to move \$230 million from the \$264 million trust fund into a stimulus program. Trustees of the trust fund filed a complaint challenging the constitutionality of the action. The trial court agreed with the plaintiffs, stating it was an "irrevocable trust." The appeals court overturned that decision, and the Ohio State Supreme Court upheld the appellate court. Obviously with that decision all state tobacco trust funds become vulnerable. As Mark Twain noted, "No man's life, liberty or property is safe while the legislature is in session," and our social-activist courts are in the same arena.

❖ SHE CAN ONLY PLEASE ONE PERSON A DAY. TODAY IS NOT YOUR DAY. TOMORROW DOESN'T LOOK TOO GOOD EITHER.

In Callaway, Florida, a man went outside his home to have a cigarette. His wife followed, telling him not to smoke when he had the flu. They argued, she struck him with a ceramic bird, jumped on him and then picked up a rock. Shouting "give me those (expletive) cigarettes" she continued to strike him with the rock, bruising his arm and bloodying his head. Their 18-year-old daughter called 911 and police and emergency vehicles arrived promptly. When the woman was cited for aggravated battery domestic violence, she responded, "Yeah, I hit him with a rock." She added, "I have been dealing with a lot of (expletive), and a woman can only take so much." Fortunately, her husband is durable without being fragile.

❖ ELECTRONIC MEDICAL RECORDS: THE GOVERNMENT MANDATE FOR THE FUTURE — PRIVATE UNTIL THEY AREN'T.

The Healthcare Information and Management Systems Society conducted a survey of 272 hospitals and practices that use an electronic health record system. The primary focus was medical identity theft. One-third of units had at least one known case. Interesting to note that hospitals at 38% were more likely to report a case of identity theft compared with medical practices which admitted to 17%. Respondents at medical practices were twice as likely to admit that their organization does not conduct a risk analysis compared with hospitals (33% vs 14%). Let's all be honest about this, or should we?

❖ THE TROUBLE WITH HEART DISEASE IS THERE IS NO BACKGROUND MUSIC.

Dutch researchers studied 4,000 patients, ages 60 to 80, for a period of 40 months. All had a history of heart disease. The purpose was to evaluate the effect of omega-3 oils along with standard drugs for the chance of a repeat heart attack. The use of omega-3 acids in margarine did not significantly reduce rates of serious heart attacks or other cardiovascular events. These findings bring into question the benefits of omega-3, which some other studies appear to indicate are beneficial. While it is a largely negative study, it is unlikely that cardiologists and other physicians on the omega-3 bandwagon are likely to change, physicians being herd animals. Too often doctors and patients embrace the latest drug or technology only to find it may not be good medicine when exposed to rigorous testing.

❖ COME JOIN US. PULL UP A SOFA.

Bulging bellies are a problem for most Americans over age 50. Average midline girth has increased about one inch per decade since the 1960s. Today, more than half the men and 70% of women have waistlines greater than recommended. A recent study appearing in the Archives of Internal Medicine followed more than 100,000 people from 1997 to 2006 for disease related to big bellies. Fifteen thousand people died during that period. The study analyzed waist size and deaths in three BMI (body mass index) categories; normal, overweight and obese. All three groups showed an increased risk with growing waistlines, even at sizes well below what would be considered acceptable. Crunching numbers on waist circumference, height and weight allowed researchers to draw conclusions as to who was

more likely to die. Individuals with four extra inches around the middle had a 15% to 25% increased risk of dying. Previous research has linked waist size to dementia, heart disease, breast cancer and asthma. Americans must get on board and reduce the calories while upping the exercise. There is no super pill and no magic diet.

❖ BE CAREFUL OF OVERSTUFFED FURNITURE AT THE SWAP MEET.

No one in the travel or hotel industry wants to talk about it, but the bed bugs have returned. It doesn't have to be a run-down shabby motel, bed bugs have even invaded five star hotels in New York and London. Moreover, they are hard to eradicate. Entomologists at Ohio State University found that bed bugs have boosted their natural defenses by generating higher levels of enzymes that can wipe out toxins. They have thicker shells that block insecticides. These little bloodsuckers are adaptable to homes, dormitories, motels, wherever they can find a meal. They like to hide in mattresses, bed frames, overstuffed furniture and can survive more than ten days without a meal. One week in February 2011, a travel feedback website had 42,000 references to bed bugs. Still, don't panic! They don't carry disease to infect the victim, they just suck ten times their body weight in human blood. The Environmental Protective Agency doesn't even blink about deaths in the tropical world from malaria caused by banning DDT, but maybe bed bugs in Washington, D.C. will change their minds about the restriction.

❖ OUT OF THE MOUTHS OF BOOBS.

Now from London, England, comes the latest in unusual dessert – ice cream made with mother's milk. A trendy ice cream parlor, The Icecreamists, promptly sold out their initial offering of "Baby Gaga." The owner boasted that the product is organic, free-range, and totally natural. Women donors are screened for health problems, paid for their milk (which we assumed was collected on premises), which is then pasteurized, churned with vanilla pods and lemon zest. Surely, they could do better with the name.

❖ DO NOT DO AN IMMORAL THING FOR MORAL REASONS.

If you thought the puritans in our society were on the defense with the loss of Dubwa, consider the actions of the Easton, Pennsylvania, local school district. The Keep a Breast Foundation is promoting rubber bracelets which carry the message "I (heart symbol) boobs" designed to raise awareness of breast cancer. Two middle school girls who wore the bracelets were suspended for violating the dress-code ban on vulgarity, obscenity and profanity. Their mothers have brought a lawsuit against local school authorities. Not to be outdone, schools in California, Florida, Oregon and Wyoming have also banned the bracelets.

❖ THE BEST WAY TO SERVE LEFTOVERS IS TO SOMEONE ELSE.

The Food and Drug Administration (FDA) is trying to get a closer grip on food poisoning. Congress is considering a food-safety bill that would allow the FDA to step up inspections and order food recalls. Nearly one in six Americans fall victim annually to abdominal cramping, diarrhea and sometimes vomiting. More than three-quarters of these cases are never traced to a particular pathogen, but the ones that are diagnosed are linked to a norovirus which causes an estimated 5.5 million events. The Center for Communicable Disease Control and Prevention (CDC) reports that food poisoning kills 3,000 each year. The primary bacterium for GI disease is the well known Salmonella which surprisingly popped up in peanuts. The current CDC numbers show a decline in food borne infections compared to 1999, but CDC official Chris Braden claims that is misleading and changes are due to data analysis and methodology.

ADDENDA

❖ According to a report released by the American Medical Association (AMA) 61% of physicians age 55 and older have been sued at least once.

❖ The American Association of Medical Colleges (AAMC) estimates that between now and the year 2015 the shortage of doctors across all specialties will quadruple with a baseline need of 63,000 physicians.

❖ Between 1890 and 1910 Bayer's Heroin was sold to treat children suffering with a strong cough.

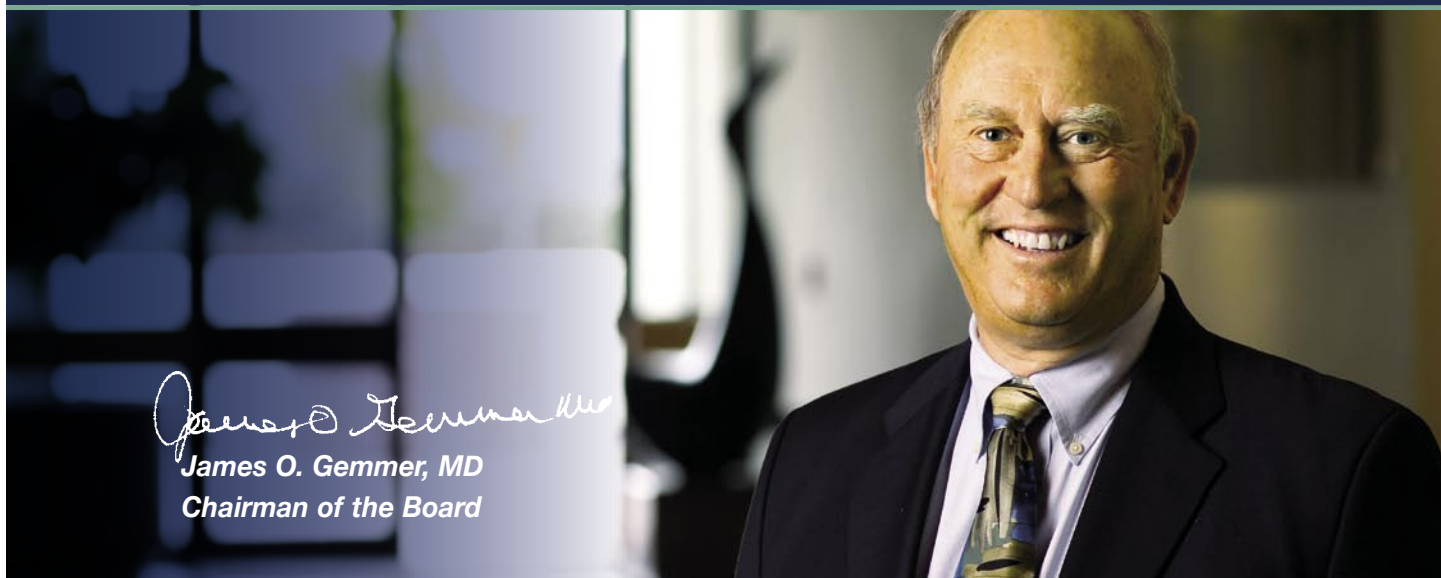
❖ The global cosmetic industry soaks up \$160 billion each year.

❖ He is a criminal lawyer, or is that redundant?

ALOHA AND KEEP THE FAITH — rts■

(Editorial comment is strictly that of the writer.)

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