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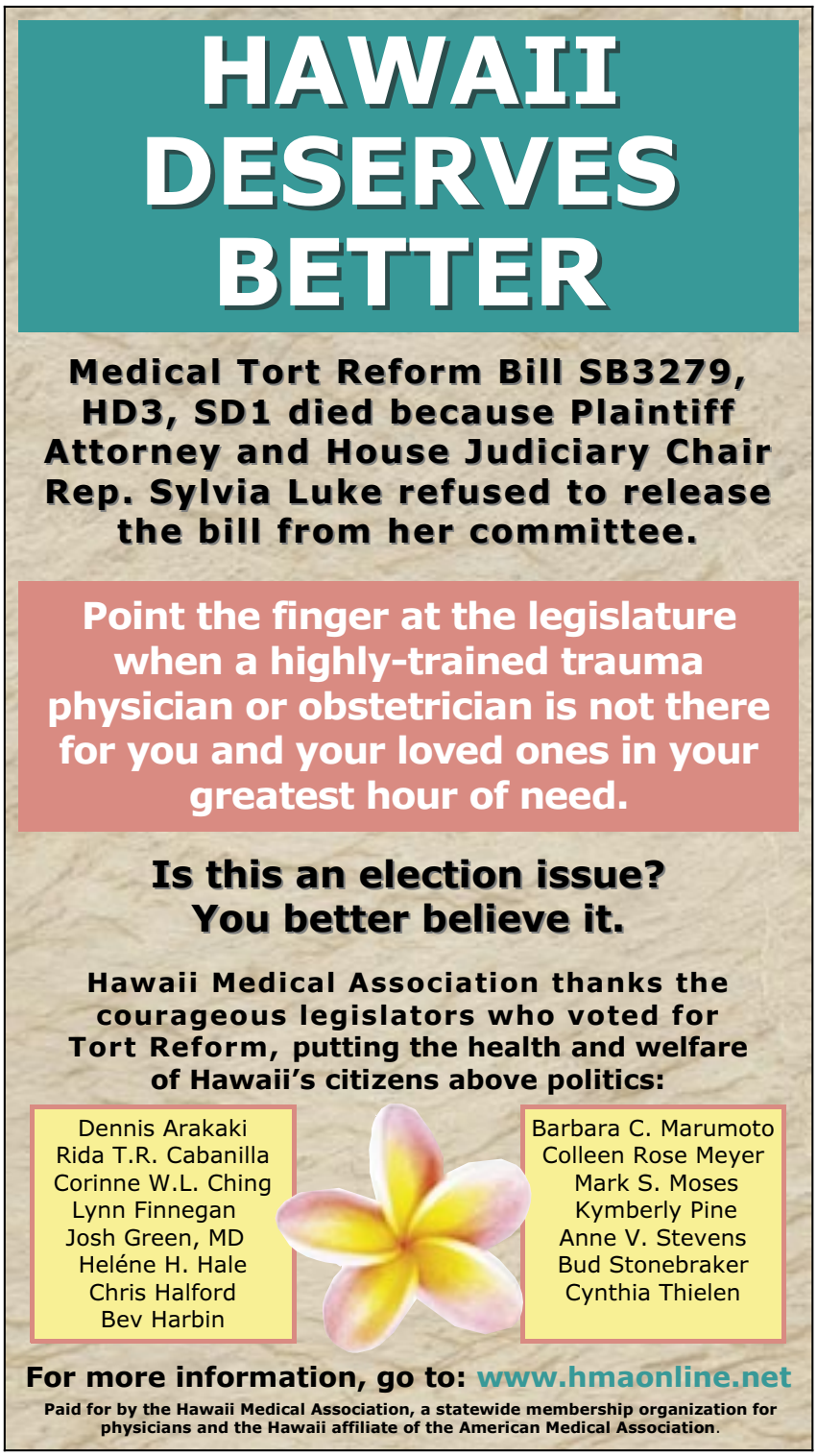

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Contents

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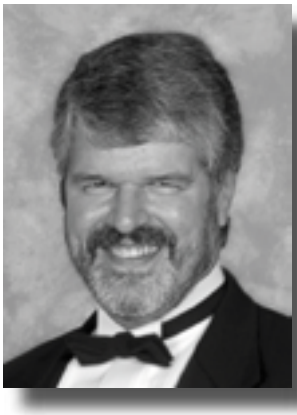
"Lā'ie and Hala'aniani"

The mythological girl Lā'ie had an affair with the surfer Hala'aniani.

HE MANA'O: THOUGHTS FROM THE EDITOR

HAWAI'I MEDICAL JOURNAL



S. Kalani Brady MD, MPH, FACP
Editor, Hawai'i Medical Journal

Medicine/Legal Issues are Top Educational Requests

A survey was performed by the Hawai'i Medical Association earlier this year to gauge the highest educational priorities of our members. The three highest rated requests all fell under the category of medical/legal issues. Specifically, tort reform, surviving a lawsuit, and risk management were felt by respondents to be the most important topics to address. They overshadowed every area of clinical medicine, information technology, and the electronic health record.

Indeed, organized medicine has the responsibility to meet the educational needs of our physicians. In the Annual Session of the Hawai'i Medical Association this fall, at which we celebrate our 150 years of service, HMA will offer presentations that address medical/legal issues. Included are J.P. Schmidt, Esq., Hawai'i State Insurance Commissioner, addressing "Navigating the Storm: Legal Issues that Affect Medical Practice" and representatives of the three major medical malpractice companies in Hawai'i sharing "Your Liability Toolkit: Minimizing the Risk of Being Sued".

Additionally, however, there is a clear mandate to communicate pearls in this field to our membership on a regular basis. Thus, I have approached John A. Burns School of Medicine Professor S.Y. Tan, Chief of Medicine and Director of Medical Education at the St. Francis Medical Center at Liliha, as well as an Adjunct Professor of Law at the University of Hawai'i William S. Richardson School of Law, about the creation of a regular column in the *Hawai'i Medical Journal* addressing medical/legal issues. He is also the author of the newly released book, *Medical Malpractice: Understanding the Law, Managing the Risk*. As physician, educator, and attorney, I believe he is eminently qualified to teach important tenets which apply to daily practice.

Mahalo, Dr. Hardman

You will note that the second article in this month's issue is co-authored by Dr. John Hardman, Chair of the John A. Burns School of Medicine's Department of Pathology. Typical of many articles which he co-authored, Dr. Hardman guided medical students in its creation. He was a tireless advocate of students, inspiration to all around him, and a true life-long learner. He passed last month from a battle with metastatic cancer. He is sorely missed. The *Journal* will be publishing a festschrift later this year in his memory.

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Liver Transplant in Hawai'i: over a hundred cases

Linda L. Wong MD, Whitney M. Limm MD, Alan H.S. Cheung MD, Hiroji Noguchi MD, and Naoky Tsai MD

Abstract

One hundred and two liver transplants have been performed since the program's inception in Hawai'i in 1993. Viral hepatitis continues to be the primary indication for liver transplant, though hepatocellular cancer is involved in 23.5% of cases. One, 3 and 5-year patient survival rates have been 88%, 79%, and 74% respectively, which is comparable to mainland centers and national data.

Introduction

Liver transplant is the currently accepted treatment for end-stage liver disease and acute fulminant hepatic failure. The first human liver transplant was performed in Denver by Dr. Thomas Starzl in 1967. In the first 7 attempts at liver transplant (5 of which were by Dr. Starzl), most patients died early after transplant from bleeding, sepsis or liver failure.[1] Since that time, refinements in surgical technique as well as advancements in critical care and immunosuppression have allowed patients to survive long-term following liver transplant.

The transplant program at St. Francis Medical Center was started in 1969 when Dr. Livingston Wong performed the first kidney transplant. Since that time, over 900 kidney transplants have been performed. In May 1993, after the recent addition of 3 new transplant surgeons with training in liver transplant, the first liver transplant in the state of Hawai'i was performed in a patient with autoimmune hepatitis.[2] At 5 years, an update in this journal described 21 liver transplants completed during this time period.[3] As more referring primary care physicians and gastroenterologists have realized the benefit of this life saving procedure, the program has been able to expand. St. Francis now reports over a hundred cases that have been performed since the program's inception.

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Methods

This is a retrospective study of liver transplant in the state of Hawai'i. All transplants were performed at St. Francis Medical Center, a 220-bed, tertiary medical center. This medical center has the only clinic dedicated to liver diseases, the only transplant center in the State and the only referral center for liver diseases for American territories of the Pacific Basin (including American Samoa, Guam, Saipan, and the Marshall Islands). Patients are referred to the transplant center by gastroenterologists and primary care physicians from throughout Hawai'i and the Pacific Basin.

Patients

One hundred and two patients (69 males, 33 females, age range 19 to 64 years, mean age 51 years) underwent liver transplant during the period from May 1993 to August 2005. Racial distribution was as follows: Caucasian – 47, Asian– 41, Pacific Islander – 8, Other – 6. Patients were evaluated by the members of the Liver Transplant Team and once approved, they were registered with the United Network for Organ Sharing (UNOS) computer. Once listed, each patient was assigned a status before February 2002 and given a Model for End-stage Liver Disease (MELD) score after February 2002. The authors collected data on demographics, etiology of disease, blood type, bilirubin, protime, albumin, creatinine, life support/intensive care management before transplant, and waiting time.

Surgical Technique

Orthotopic liver transplants were carried out in the standard fashion primarily using a modified veno-venous bypass. A 20 French femoral catheter was placed percutaneously in the left femoral vein thru a venous roller pump with return to two 8 French cordis catheters in the internal jugular veins. Standard portal vein, hepatic artery and vena cava anastomoses were performed and arterial or venous grafts were done as needed for portal vein thromboses or arterial insufficiency. Bile duct-to-bile duct anastomoses over t-tubes were done for all patients except those with primary sclerosing cholangitis or significant size discrepancies between donor and recipient bile ducts. Data on donor age, cold ischemia time (time from the removal of the liver from the donor until the time the donor liver is revascularized in the recipient), warm ischemia time (time from removal of the donor liver from cold storage until revascularization in the recipient), transfusions, and operative time were noted.

Immunosuppression

This center had a tacrolimus based immunosuppressive regimen. Induction therapy with rabbit anti-thymocyte globulin was used when patients had significant pre-transplant renal insufficiency that would preclude early use of tacrolimus. Patients were given solumedrol 1000 mg at revascularization and a steroid taper of solumedrol 200 mg to 20 mg over 6 days. Steroids were tapered to prednisone 15 mg at 2 weeks. Patients were tapered off steroids completely depending on primary disease: hepatocellular cancer: 3-6 months, hepatitis B: 6-9 months, hepatitis C: 9-12 months, alcoholic cirrhosis: 6-12 months. A maintenance dose of steroids were used for those patients with autoimmune etiologies. Azathioprine (2 mg/kg) was used from 1993 until 1998 and mycophenolate mofetil (1gm twice a day) from 1998 to 2004. These agents were adjusted for leukopenia. Tacrolimus was started on post-operative day 2 and adjusted to keep a tacrolimus level between 8 and 10 ng/dl. After one year, patients were generally maintained with low dose tacrolimus (level about 4-5 ng/dl) and a reduced dose of mycophenolate mofetil. A number of patients were switched to a cyclosporine based regimen for various reasons including: new-onset diabetes, renal dysfunction, and headaches.

Post-operative care

Following transplant, patients were observed in a 14-bed medical-surgical intensive care unit. Nursing staff in this unit cares for all post-operative transplant patients including liver, heart, pancreas and kidney, in addition to open-heart surgery and neurosurgery cases. Patients were later transferred to a medical-surgical ward with nursing staff that had been specifically educated on liver transplant management. Data on surgical complications, re-operations, and hospital length of stay were collected. Finally, survival statistics were compiled.

Results

Recipient characteristics

One hundred and two underwent liver transplant in the period between 1993 and 2005. Etiology of disease was primarily viral hepatitis as demonstrated in Table 1. In addition to these primary etiologies, 24 patients had hepatocellular cancer (HCC). Twenty-one patients had known HCC at the time of transplant and 3 patients were incidentally found to have HCC on the explanted liver. These 3 lesions were all 2 cm or less.

At the time of transplant, mean bilirubin was 8.8 ± 8.0 mg/dL, albumin 2.9 ± 0.7 g/dL, and prothrombin time 17.8 ± 6.3 sec (INR 1.48 ± 0.3). Thirty-seven (36.3%) patients had albumin less than 2.8.g/dL Nine patients (8.8%) had creatinine greater than 2.0 mg/dL. Mean MELD score of the 47 patients transplanted during the MELD era was 23.7 ± 8.4. Eighteen patients (17.6%) were hospitalized due to multiple complications when a liver became available for transplant. Mean waiting time for liver transplant was 196 ± 279.4 days. Fourteen patients waited more than one year for liver transplant.

Table 1:— Etiology of liver disease

Etiology of ESLD	# of patients
Hepatitis C	54
Hepatitis B	15
Alcoholic liver disease	14
Primary Biliary Cirrhosis	5
Cryptogenic/NASH	5
Autoimmune	4
Fulminant Liver failure	3
Hemochromatosis	1
Primary Sclerosing Cholangitis	1
Hepatocellular Cancer	24

Donor and operative characteristics

Ninety-eight donor livers were obtained within the State of Hawai'i and two donor livers were imported from elsewhere in UNOS Region 5/6. During the time period between 1993 and 2004, there were 244 deceased donors that allowed recovery of 176 livers. Eighty-five livers were procured and exported to mainland centers, though not all livers were eventually used. Distribution by year is shown in Figure 1.

Of the 102 patients who underwent liver transplant in Hawai'i, the donor age ranged from 12 to 64, with mean donor age of 38 years. Fourteen donors were 55 years or older. Mean cold ischemic time was 394 minutes with range from 105 to 1030 minutes. All livers from local donors were placed within 14 hours of removal from the donor. Of these, 53 patients had their liver placed within 6 hours and 40 patients had their liver placed between 6 and 10 hours from explantation from the donor. Cold ischemic times on the imported donors were 840, 856, 882, and 1030 minutes. Mean operative time was 431 minutes and patients received a mean of 13.0 units of packed red blood cells.

Post-operative care/Survival statistics

Nineteen patients underwent 21 re-operations. Twelve patients required re-exploration for bleeding during the early post-operative course. Four patients required biliary reconstruction with hepaticojejunostomy due to leak or stricture within the first 6 months of transplant. Two patients had small wound dehiscences that required surgery. Two patients dislodged their t-tubes in the early post-operative course and required re-operation. One patient had drainage of a mucocele on the cystic duct stump. Mean hospital length of stay for the 102 patients was 11.1 days.

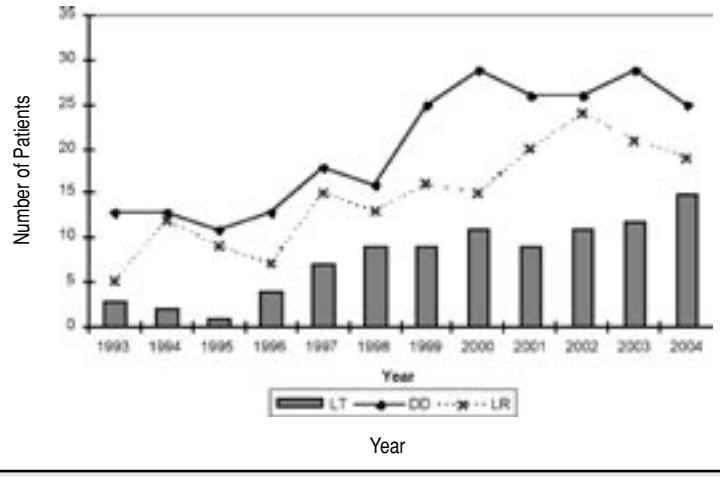

Figure 1:— Number of liver transplants performed in Hawai'i (LT), deceased donors (DD), all livers recovered from deceased donors (LR) by year.

Table 2:— Cause of death in 22 patients

Cause of Death	# pts
Sepsis/Pneumonia	4
Bleeding	4
Recurrent hepatitis C	4
Neurologic/brain death	3
Cardiac/MI	2
Recurrent hepatocellular CA	2
Lung CA	2
Suicide	1

Table 3:— Child's Turcotte Pugh Score and MELD score

Points	1	2	3
Bilirubin	<2.0 mg/dL	2.0-3.0 mg/dL	>3.0 md/dL
Albumin	>3.5 g/dL	2.8-3.5 g/dL	<2.8 g/dL
Protime (INR)	<1.7	1.7-2.3	>2.3
Ascites	None	Mild	Moderate
Encephalopathy	None	grade I-II	grade III-IV

MELD = (0.957 x Loge(creatinine) + 0.378 x loge(bilirubin) + loge(INR) + 0.643) x10

There was no primary graft nonfunction, one retransplant for recurrent hepatitis C and 2 late hepatic artery thromboses, which did not require retransplant. One patient developed partial portal vein thrombosis related to a hypercoagulable state and was rescued with anticoagulation.

One, 3, and 5-year patient survival rates were 88%, 79%, and 74% respectively . Of these 102 patients, 80 are currently alive and the remaining 22 have died of the causes listed in table 2. Of 24 patients with HCC: 20 are alive, 2 died from recurrent disease (253 and 1428 days post-LT), 1 died due to a ruptured hepatic artery aneurysm (151 days), and 1 died from complications of noncompliance related to alcohol use (723 days). Of 50 patients in whom alcohol was thought to be a contributing factor, only 2 patients returned to alcohol use. One patient died, as mentioned previously and the second patient is currently abstinent after intensive counseling by our medical center's psychology/social service staff.

Discussion

Currently in the US, the most common indications for liver transplant include viral hepatitis B and C. These are categorized under "non-cholestatic liver disease" and account for 58.8% of the indications for transplant. Other indications include cholestatic diseases – 9.4%, fulminant liver failure – 7.1%, primary hepatic malignancies – 6.2%, metabolic diseases – 3.4%, biliary atresia – 3.2%, and other -11.9%.[4]

Determining who needs a liver transplant and the proper timing for referral, listing, and the actual liver transplant procedure have been evolving issues. In the early 1990s, allocation of the liver was determined by the Childs-Turcotte-Pugh score (CTP) and location of the patient (in the intensive care unit, regular hospital ward, or at home). The CTP score is based upon bilirubin, protime, albumin, and the presence of ascites and encephalopathy. Because there were only 4 different statuses and subjective variables (ascites and encephalopathy), the allocation scheme was not felt to be optimal. In February 2002, the allocation policy changed completely and all patients were assigned a Model for End-stage Liver Disease (MELD) score. MELD was initially used to determine prognosis for patients undergoing transjugular intrahepatic portasyhstemic shunts and was used in response to a mandate from the federal government to improve liver allocation. The goals of MELD were to eliminate waiting time as a factor, distribute livers to the most ill, and to eliminate subjective variables. MELD score is determined by complicated equation based on bilirubin, protime and creatinine. Patients are each assigned a score from 6 to 40 and patients are transplanted from the highest MELD score to the lowest. (see table 3)

The MELD system was quite successful at achieving the stated goals and has since decreased the waiting list size and the death rate. Most importantly, it has allowed transplant physicians to better predict who will die and who is too sick for liver transplant. The American Association for the Study of Liver Disease (AASLD) has thus developed guidelines as to when a patient should be referred for liver transplant:

"Recommendations:

1. Patients with cirrhosis should be referred for transplantation when they develop evidence of hepatic dysfunction (CTP ≥ 7 and MELD ≥ 10) or when they experience their first major complication (ascites, variceal bleeding or encephalopathy)

2. *Children with liver disease should be referred when they deviate from the normal growth curves or develop evidence of hepatic dysfunction or portal hypertension.*

3. *Patients with type I hepatorenal syndrome should have an expedited referral for liver transplantation."*[5]

The MELD score also considers liver transplantation for hepatocellular cancer and assigns extra points for those with small cancers. Liver transplant is probably the best treatment for survival and decreased recurrence in a small hepatocellular cancer. Because there are limited donor organs and because patients will be on immunosuppression, we need to select only those patients who have no evidence of extrahepatic disease and are not candidates for resection. AASLD guidelines have indicated the following:

"Recommendations:

1. *Liver transplantation should be viewed as the treatment of choice for selected patients with hepatocellular cancer who are not candidates for surgical resection and in whom malignancy is confined to the liver.*

2. *Optimal results following liver transplant are achieved in patients with a single lesion 2 cm or larger and less than 5 cm, or no more than 3 lesions, the largest of which is 3 cm and no radiographic evidence of extrahepatic disease.*

3. *For ideal outcomes, patients who meet these criteria should receive a donor organ within 6 months after listing for transplantation."*[5]

In Hawai'i, indications for liver transplant are also most commonly viral hepatitis B and C, which account for 67.6% of all patients. Hawai'i has fewer patients (5.9%) with cholestatic diseases and fulminant hepatic failure (2.9%). Twenty four patients (23.5%) had hepatocellular cancer at the time of the transplant which is much higher than the US statistics. Hawai'i has the highest incidence and death rate of liver cancer in the US and this may be contributing to the slightly different patient mix. [6]

Because of Hawai'i's unique issues of geographic isolation, high incidence of hepatocellular cancer, and small population size, it has been necessary to develop strategies to maintain surgeon skills, nursing staff experience, and quality. Most importantly, great efforts have been made to minimize cold ischemic times. Many studies have demonstrated that prolonged cold ischemic time increases patient mortality and allograft injury.[7-11] One study indicated that the best graft function occurred in those patients with cold ischemic time under 12 hours and warm ischemic time less than 45 minutes.[11] Over 91% of livers were implanted with cold ischemic times less than 10 hours and the mean cold ischemia was 6 hours and 33 minutes. Mean warm ischemia was 23.7 minutes and only one patient had a warm ischemia more than 45 minutes. Recipient procedures are frequently started at the same time as the donor procedure. The transplant team

See ***LIVER TRANSPLANT*** p.178

Synchronous Liver Cancers: A Rare Tumor Combination in an Elderly Japanese Woman

Dorothy M. Shigaki MS, Ashlee C. Nekoba BS, Jasmine Y.H.E. Ide BS, John M. Hardman MD, and Jinichi Tokeshi MD

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Abstract

Hepatocellular carcinoma (HCC) and cholangiocarcinoma (CC) may occur simultaneously in a person with primary liver cancer. However, HCC and CC arising from separate foci is extremely rare. This is a case presentation of a 66-year-old woman with primary combined HCC-CC, who had no risk factors for either tumor.

Introduction

Synchronous primary malignant tumors of the liver are reported in 1.0-6.3% of cases with primary liver cancer.[1-3] Synchronous hepatocellular carcinoma (HCC) and cholangiocarcinoma (CC) can present as an intermingling of both neoplasms, or as separate discrete tumors. Only 0.1-0.5% of synchronous liver cancers present as discrete tumors.[3-6] We present the case of a 66-year-old Japanese woman who has HCC and CC arising as separate tumors, with no risk factors for hepatic malignancy.[7]

Case Presentation

This 66-year-old Japanese woman with a past medical history of hypertension, asthma, diabetes mellitus type II, and smoking history of 30 pack-years presented with a palpable epigastric mass in February 2002. She denied abdominal pain, jaundice, or fatigue. In addition, she reported an intentional ten-pound weight loss over the past year. She had no history of alcohol abuse, liver cirrhosis, primary sclerosing cholangitis, *Opisthorchis viverrini* or *Clonorchis sinensis* infections, ulcerative colitis, or choledochal cysts. She was HBV antigen negative as well as hepatitis B and C antibody negative. Serum CEA levels were within normal limits. Serum AFP levels were initially normal, but later increased to 7443 ng/ml. Initial computed tomography (CT) scans revealed a 9-cm tumor in the left hepatic lobe (liver segment 3). The biopsy specimen was initially interpreted as a sclerotic hemangioma. In May 2002, a second 2-cm nodule was found in the liver dome (segment 8), and a third 2 cm mass (liver segment 4A) was found in August 2002. By November 2002, the masses had increased in diameter to 4.0 cm and 3.5 cm, respectively. Two months later, a CT-guided liver biopsy of the medial segment of the left lobe revealed a cholangiocarcinoma. In March 2003, CT scan and ultrasound (US) revealed an increase in tumor size. No new masses were noted. The hemangioma appeared unchanged. Bone scans were negative for bony metastases. Given the extensive tumor involvement, ultrasound-guided radiofrequency ablation (US-RFA) was performed in April 2003. During the procedure, multiple biopsies of the liver masses were obtained. The US-RFA ablated approximately 60% of the tumors. However, the tumor continued to grow, leading to hepatic and eventual multi-organ failure. The patient expired in March 2004. Her total clinical course was 2 years.

Findings of Resected Specimen

The CT image from November 2002 (Figure 1) showed the tumors in close proximity, suggesting the possibility of a combined HCC-CC arising from a single tumor, or two separate intermingling tumors. However, two distinct patterns of primary liver cancer were identified in the liver biopsies without any evidence of transition or intermingling (Figures 2A and 2B): a hepatocellular carcinoma in liver segments 6 and 8 (Figure 2A), and a cholangiocarcinoma located in hepatic segments 3-5 (Figure 2B). This probably represents a Type I combined HCC-CC tumor as described by Goodman et al.[5] The well-differentiated hepatocellular carcinoma is composed of disorganized, moderately pleomorphic cells resembling hepatocytes (Figure 2A). The tumor cells are arranged in trabeculae about the capillary sinuses. The vascular network and lining endothelium were well-demarcated by the reticulin stain and immunostain for CD34, a transmembrane glycoprotein that is expressed on endothelial cells. Mitotic activity was absent. Canalicular staining within the tumor and surrounding liver was demonstrated by a polyclonal immunohistochemical stain for carcinoembryonic antigen (CEA). This feature is typical for hepatocellular carcinoma.[8] Immunohistochemical stains for cytokeratin (CK) 7 and 20 were negative, as found in majority of hepatocellular carcinomas.[9] The cholangiocarcinoma is characterized by well-differentiated glands resembling bile ducts that are surrounded by dense fibrous connective tissue (Figure 2B). Immunohistochemical

staining for cytokeratin 7 and for anti-cancer antigen (CA) 19-9 was positive in this sample, which is expected in cholangiocarcinoma.[8-10]

Reported clinicopathological findings for combined HCC-CC tumors varied across studies. Elevated serum AFP (> 20 ng/ml) was noted in 14.3% to 75% of cases.[1-2, 11-13] Serum CEA (<5.2 ng/ml) was found in 14% to 47% of cases.[1,2, 11-,13] CK 7 and 19 were positive in 80% of the cases.[2] Elevated serum AFP, CEA, and CA 19-9 levels are noted in case reports of HCC-CC.[6,13-14] Our patient presented with a normal CEA (>3 ng/ml) and developed an elevated AFP of 7443.0 ng/ml post-operatively. Serum CA 19-9 levels were not reported.

Discussion

Among studies, discrepancies exist on the demographics, risk factors, and the clinical presentation of patients with combined HCC-CC lesions. Lee et. al.,[15] report that 11.8% of patients with HCC-CC present with a palpable mass, compared to 1.9% of patients with CC. Studies report male-to-female ratios ranging from 5:1 to 27:1.[1-2] However, Janargin et. al.,[13] report a male-to-female ratio of nearly 1 (14/13). HbsAg seropositivity ranged from 15% to 57.1%.[1-2, 11- 13] While the incidence of HCV-positive patients ranged from 42.9 to 66.7%,[1,2,12] the incidence of chronic hepatitis ranged from 20-33.3%.[1, 11]

80-85.7% of the HCC-CC population had chronic liver disease.[1,11] HCC is usually associated with chronic liver diseases and cirrhosis, whereas CC usually occurs in a non-cirrhotic liver. Many papers state that HCC-CC resembles HCC more than CC, but also report cirrhosis in the majority of their patients.[1] Janargin et. al., did not include patients with liver cirrhosis in their study and they concluded that HCC-CC was more CC in character.[13]

Conclusion

Our patient presented with an epigastric mass, denying abdominal pain, jaundice, or fatigue. She did not have known risk factors for hepatocellular carcinoma, including viral hepatitis or chronic liver disease.[1-3, 11-13] In addition, there was no history of primary sclerosing cholangitis, *Opisthorchis viverrini* or *Clonorchis sinensis* infections, ulcerative colitis, or choledochal cysts, which are risk factors for cholangiocarcinoma.[7] Imaging studies revealed two masses in close proximity in the left lobe of the liver. However, there was no evidence of histological transition, or similarities between the masses, with cytokeratin staining, suggesting that the adjacent tumors arose from two separate foci. It is unusual for a person with no risk factors for either HCC or CC to develop separate tumors synchronously. Further investigation of this unique malignant process is required to determine the underlying cause of this disease.

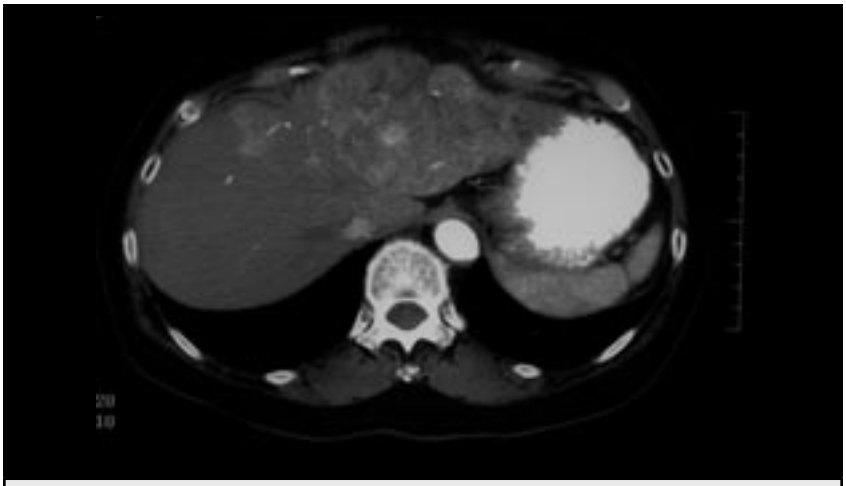

Figure 1.— Large heterogeneous enhancing mass in left lobe. (CT taken on Nov. 29, 2002)

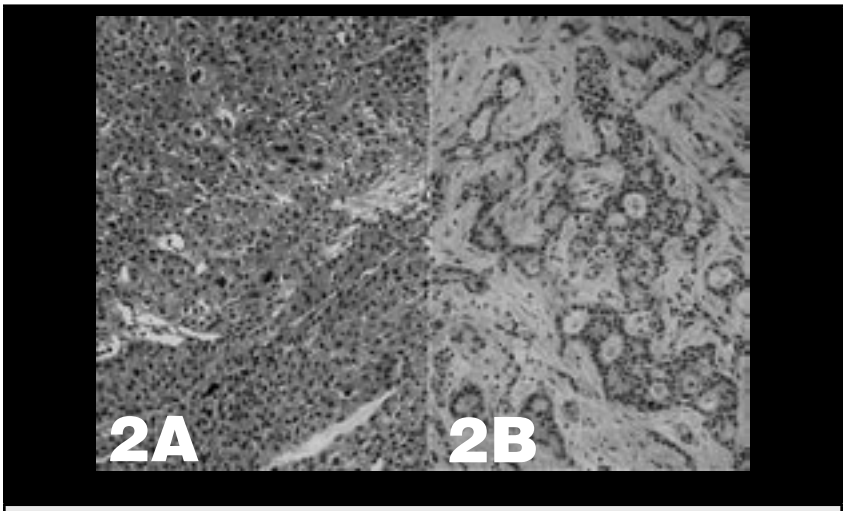

Figure 2.—
A. Hepatocellular carcinoma. Well-differentiated, moderately pleiomorphic cells resembling hepatocytes are randomly organized around the capillary sinus. (H&E 400x)
B. Cholangiocarcinoma. Well-differentiated glands resembling bile ducts are surrounded by dense fibrous connective tissue. (H&E 400x)

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Valve replacement in endocarditis: setting limits in noncompliant intravenous drug abusers

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Abstract

An intravenous (IV) drug abuser underwent repeated valve replacements because of recurrent infective endocarditis. Is it ethically permissible to withhold valve surgery in a recalcitrant, noncompliant IV drug abuser? We believe so, and in our analysis, discuss the principles of futility, rationing, personal responsibility, and justice. Because of her continued drug abuse, the patient is responsible and accountable for the medical consequences. The consequences are that physicians will not be able to provide her with beneficial treatments without disproportionate harm, and that society will no longer be able to provide resources for her treatment without unfairly jeopardizing the availability of resources for other members of society. Although valve surgery does not constitute futile treatment, maximizing and egalitarian principles of societal justice support the withholding of such an expensive intervention. The patient should be jointly evaluated by the physician, social worker, and psychiatrist. The medical team will emphasize patient compliance and willingness to undergo drug rehabilitation, and will offer the first valve replacement. The recidivist abuser with demonstrable non-compliance who sustains a second episode of endocarditis need not be offered another valve. To avoid bedside rationing, we recommend the formulation of such a policy by nations and professional bodies.

Case Report

Y, a 21-year-old woman with a long history of intravenous (IV) drug abuse, was admitted for methicillin-resistant Staphylococcus aureus infective endocarditis of a prosthetic mitral valve. She had previously received two mitral valves as a result of infective endocarditis. Y smoked cigarettes from age 10, and abused methamphetamines, heroin, and oxycontin. She did not work, stating that she was "lazy." She refused substance abuse counselling and treatment, stating: "I can stop on my own." When antibiotic therapy failed and heart failure developed, she underwent her third valve replacement. Despite signing an agreement, the patient was non-compliant with medical orders, continued to smoke in hospital, and abused hospital staff. She finally discharged herself against medical advice from a step-down care hospital. She died a few months later from bacterial endocarditis.

Discussion

This case vignette raises the issue whether it is ethically permissible to withhold repeat valve replacement surgery in recalcitrant, noncompliant IV drug abusers. We believe it is, and we set forth our analysis below. However, we would like to caution that the mechanism for making such decisions remains controversial.

Futility

The concept of medical futility has been debated for decades without clear consensus on its meaning and use. We favor Schneiderman's classification of quantitative and qualitative futility, the first being failure of treatment in a hundred similar cases, and the latter defined as "any treatment that merely preserves permanent unconsciousness or that fails to end total dependence on intensive medical care".[1,2] Futile treatment is incapable of conferring any meaningful benefit upon the patient as a whole. Accordingly, the provision of futile treatment is not ethically required.

Infective endocarditis is a known complication of IV drug abuse, and prosthetic valves are doomed to re-infection if IV drug abuse continues. Although some may argue that this constitutes medical futility, we are unwilling to do so. Initial successful valve replacements do confer a benefit by allowing the patient, even those who are non-compliant, to return for a time to their normal activities.

Autonomy, Rights and Responsibilities

If one denies this patient surgery, is one violating the patient's autonomy by denying the patient's right to abuse drugs and right to receive appropriate treatment?

Autonomy can be defined as the moral right to choose and follow one's own plan of life and action.[3] However, there is no protected right to engage in an illegal activity; and the use of illicit drugs comes with known consequences. These may be medical, e.g., endocarditis, or legal, such as being jailed, or social, such as losing a job or estrangement from family and friends.

Respect for autonomy must be reciprocated by a parallel responsibility for the consequences of one's actions.

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M. Barbera Honnebier, M.D., Ph.D., Plastic Surgeon

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In short, people have autonomy over, as well as responsibility for, their own health. John D. Rockefeller Jr. said it well, in a different context: *"I believe that every right implies a responsibility, every opportunity an obligation, every possession a duty."*

Volitional Control

A recurring argument against setting healthcare limits in this context is that drug addicts do not have true volitional control over, and therefore cannot be held responsible for their actions. This argument invokes notions such as ignorance, genetics, poverty, disadvantaged upbringing, childhood abuse, and so on to explain the anti-social behaviour. While these may be legitimate factors to consider, and all patients deserve compassion and empathy, we take the position that absent a compelling situation, all individuals are capable of free choice and must remain responsible for their decisions. This is supported by the observation that many IV drug users are successfully rehabilitated, and that the criminal justice system holds individuals responsible for crimes committed during drug intoxication.

The U. S. Supreme Court appeared to hold this view in *Traynor & McKelvey v Turnage*.[4] There, the plaintiffs, who were veterans, sought extended benefits from the Veteran's Affairs administration (VA). Veterans are normally entitled to an extension of the benefits period if a handicap for which they are not responsible prevents them from utilizing their benefits within 10 years of discharge. The plaintiffs alleged that their earlier problems with alcoholism constituted a handicap for which they were not responsible. Justice Byron White, writing for the majority, reasoned that alcoholism was not the result of an underlying psychiatric disorder, and was not entirely beyond the agent's control. The Supreme Court therefore held that Traynor's and McKelvey's alcoholism was a willfully incurred disability, and hence barred them from receiving extended VA benefits.

Glannon has identified four components of causal control over one's health.[5] The first is that the patient's actions must not be externally compelled, such as in extreme social deprivation or abuse. The second component is autonomy. Autonomy requires the "capacity for reflective self-control regarding the desires, beliefs, and intentions that issue in choices and intention."[5] Thirdly, a person must have the capacity to look ahead and see where his choices will lead him. Finally, the consequences of the diseased condition must be sensitive to the choices that a person makes over time. For example, the progression of cirrhosis will be affected by continued alcohol abuse. Using these criteria, Glannon concluded that with causal control over aspects of one's health, one bears a certain responsibility to it, failing which one assumes a lower priority claim over scarce resources.

In contrast, Martens has pointed out that alcoholism has many root causes, and is defined as a mental disorder under DSM-IV.[6] Others have listed patients' lack of knowledge, socio-economic and genetic reasons, and the culpability of government and social institutions as factors why intensive care should not be denied to substance abusers.[7-9] We believe that such factors can only partially account for this patient's continued drug abuse and do not obviate volitional control over free choice.

Justice

If we were to deny surgery to this patient, we would be rationing healthcare. Rationing can be defined as: 1) limiting expectations of healthcare, even where healthcare is beneficial; or 2) denying healthcare treatments, even where treatments are life extending, restorative, or ameliorative; or 3) any implicit or explicit mechanism that allows people to go without beneficial services.[8, 9]

The idea of rationing is anathema to many healthcare practitioners. Yet in a world in which demand for healthcare exceeds limited resources, rationing is inevitable, and it can be ethical if it is just. There are various accepted principles of justice in healthcare.[10] The maximizing principle distributes healthcare resources to bring about the best possible consequences, usually with regard to a population's aggregate health. In this patient, the inevitable end point is yet another episode of bacterial endocarditis that drastically reduces the life span of the valves. Limiting wastage maximizes limited resources.

The egalitarian principle of justice refers to the equalization of the "opportunity for lifetime health, rather than achieved levels of health, to account for the individual freedom of choice and autonomy in making choices that influence health."[10] Hence justice is done if people who do not look after themselves achieve lower levels of health. Y, having had 2 valve replacements, had her fair share of opportunity to improve her health.

Schneiderman and Jecker drew the distinction between medical justice and societal justice.[11] In the "field of medical justice, it is ethically unacceptable to withhold treatments on the basis of societal worth, since societal worth has no moral relevance in medical decision making..."[11] However, societal justice is necessarily comparative, and considers the social utility and morality, among other factors, of individuals as viewed by society. Under this analysis, Schneiderman has concluded that it may be morally justifiable to deny a heart transplant to a convicted felon if the utilitarian and social value of an individual is important to society.[11]

Not all irresponsible health behaviour should result in the limitation of government supported healthcare. Degree and type obviously matter. Overeating and smoking may all be undesirable traits, but these behaviours affect mostly the individual, less so the rest of society. On the other hand, IV drug abuse imposes an immediate and drastically elevated risk of infective endocarditis in one with a prosthetic valve, and exerts damaging effects on society such as crime, family rupture, and absenteeism from work. Drug abusers are also unable to contribute to the societal health purse, and often rely on state help. Together, these add up to a serious violation of the social contract.

The "Here and Now"

When would irresponsible behaviour result in withdrawal of publicly supported healthcare? If we take a stand with recalcitrant IV drug abusers, are we beginning the slide down the slippery slope? Where do we draw the line? The slope does exist. Nonetheless, the line must be drawn somewhere. We should make an attempt to resolve those that are less controversial, more easily accessible. Hence, these recommendations should not be extrapolated to other diseases and their associated risk factors, be it smoking and emphysema, overeating and diabetes etc. Each disease and its risk factors must be individually examined and debated.

Comparisons with heart transplant

Although there are no clear United States guidelines on the transplantation of hearts for drug and alcohol abusers, UNOS (United Network for Organ Sharing), in a bioethics white paper, states that past behavior resulting in organ failure should not be the sole basis for excluding transplant candidates. We agree with this position and with UNOS's general caution regarding individuals who have "demonstrated serious, consistent, and documented non-compliance in current or previous treatment."[12] However, the British 2002 national protocol for heart transplant patients lists "continued abuse of alcohol or other drugs" and "psychiatric history likely to result in non-compliance and/or persistent non-compliance with medical therapy" as absolute contraindications.[13]

Bedside Rationing

While there is a need for society to justly ration scarce resources, physicians are taught not to engage in bedside rationing. Ubel defines bedside rationing as having occurred when a physician or other clinician does less than the best for the patient in order to save societal resources. Examples are when a physician withholds, or fails to recommend, a service that is in the patient's best medical interests, or acts primarily to promote the financial interests of someone other than the patient.[14]

Physicians must always remain the patient's advocate, and there are risks in directly rationing health dollars and allocating them between individual patients. Hence, while we discuss the underlying ethics in such a scenario, we do not suggest bedside rationing for such cases. Although institutional ethics committees may be able to assist physicians in some of these cases, we prefer that states and professional organizations together confront allocation issues so as to formulate just policies that conserve society's limited healthcare resources.

Conclusion

We believe there is no ethical duty to provide valve replacement therapy for the recalcitrant, non-compliant IV drug abuser who insists on continued IV drug abuse and who refuses drug rehabilitation. We come to this conclusion because:

1. The patient had autonomy to decide on her choices in life, including IV drug abuse, and hence bears the responsibility for the consequences of her actions;
2. Infective endocarditis is a foreseeable consequence of IV drug abuse;
3. Denying surgical treatment is just as financial resources are limited and are better utilized on other needy patients, maximizing the aggregate health of society;
4. It is just because the patient had had adequate opportunity to improve her health, including previous valve replacements, and others deserve their opportunity to use limited resources as well.

The attending physician, social worker, and psychiatrist should jointly evaluate recalcitrant, noncompliant, IV drug abusers with infective endocarditis. The medical team should generally offer the first valve replacement. The recidivist abuser with demonstrable non-compliance who sustains a second episode of endocarditis need not be offered another valve. We are not insistent that only one valve be allotted, but we believe that there exists a finite limit in the face of continued patient non-compliance. To avoid the pitfalls of bedside rationing, nations and professional bodies should consider implementing just allocation policies, so that physicians may act within a defined professional standard of care.

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Trauma System Development: Crisis at our Doorstep

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Background

Traumatic injuries remain a leading cause of morbidity and mortality in the United States. The care of the injured patient has evolved tremendously since the publication by the National Academy of Sciences entitled, "Accidental Death and Disability: The Neglected Disease of Modern Society," in 1966.[1] Federally mandated legislation provided for the subsequent development of prehospital emergency medical systems, crafted to assure the expeditious transfer of critically injured patients to definitive care facilities. It was well appreciated from lessons learned during the World Wars and the Vietnam War that treating patients during the "golden hour" following injury improved the chance of survival significantly, and limited the sequelae of the traumatic event, such as physical and mental disability. Collectively, this allowed patients quicker recovery into functional, productive citizens, reducing the burden of injury and hence decreasing costs to society. It is noteworthy that these early, definitive care facilities became the precursors of what are now identified as trauma centers.

The Development of Trauma Centers and the Evolution of Trauma Systems

The American College of Surgeons (ACoS) has taken a pivotal leadership role in the promulgation and the propagation of a systematized approach to treating traumatic injuries. The Organization was founded in 1913. Its mission is to improve the care of the surgical patient and to promote the education of surgeons. The ACoS Committee on Trauma (COT) was the first standing committee of the College, established in 1922. However, it was not until 1976 that the COT first published a document that defined the optimal approach to trauma care.[2] The COT provided a framework for the categorization and verification (by this Committee) of trauma care facilities (trauma centers) into four levels, based on specific criteria that delineated infrastructural requirements necessary to qualify for each of the four levels. This has since undergone numerous iterations, reflecting over time the alteration in the strategic direction of the ACoS. In particular, the College acknowledged the paramount importance of a coordinated system of trauma care, with trauma centers constituting the flagships of these systems and not independently functioning units. This was a necessary paradigm shift, because of the distinct lack of organization and coordination of the relevant components of an efficient, fully operational trauma system that was a consequence of the oftentimes haphazard development of trauma centers and emergency medical services across the Country. The structural orderliness and comprehensiveness of an efficient system, by design, would assure full and undeniable public access to the system, timely transport and judicious triage to an appropriate level, definitive care network of trauma centers, and allow for provision of services devoted to convalescence and rehabilitation.

The fundamental focal point of any trauma system is the trauma center. Implicit in this relationship is the inherent requirement that any functional trauma center must provide the highest level of comprehensive care, generally at an ACoSCOT level I or II center. Evidence supports the concept that the best care provided for the injured patient is in a level I center. A recent multi-institutional investigation evaluated level I trauma centers and nontrauma centers for differences in hospital mortality and mortality within 30, 90, and 365 days after injury.[3] The authors after adjusting for differences in case mix, utilized propensity score weighting to adjust for potential biases and demonstrated a statistically significant lower risk of death if care is provided in a trauma center. The authors point out that the study did not include rural areas of the United States and hence the results may not be applicable to those areas. This study also did not address the other levels (II, III, and IV) of trauma centers. Others have published similar findings.[4-10] From an international perspective, Peleg, et al, and the Israel Trauma Group recently published a retrospective cohort study of their outcomes that reveal a significant reduction in the inpatient death rate of severely injured trauma patients at all Level I trauma centers in Israel after the implementation of a national trauma system in Israel.[11]

Trauma Systems Are Effective, but Are They Threatened with Extinction with the Collapse of their Network of Trauma Centers?

The data substantiating the effectiveness of trauma systems nationwide is also quite compelling, particularly in the context of injury related outcomes. For example, Mullins, et, al, in 1994 and in 1999, demonstrated improved outcomes, primarily measured as hospital survival, with the institution of a trauma system in an urban setting.[12,13] Other authors reported similar findings.[14-16] Conversely, the lack of a coordinated trauma system is adversely associated with poorer outcomes, as noted in observational studies by Rogers, et al, and Harrington, et al.[17,18] Not unexpectedly, the adverse outcomes are magnified in the rural setting, contributed to, in part, by limitation of resources otherwise available in larger, urban centers.

It follows from this dialogue that the highest level trauma centers (based on ACoS criteria and verification) that function within operational trauma systems provide superlative care to the public, substantiated by the best outcomes. The National Foundation for

Trauma Care in May 2004 published a document which portrayed foreboding statistics.[19] This is a non-profit organization whose mission is "to secure the economic viability of the nation's trauma centers." The Foundation called attention to the fact that thirty trauma centers had closed since 2001, and further projected that 10 to 20% would close over the next few years. This forecast followed closely on the heels of the National Inventory of Hospital Trauma Centers, which showed that there had been an increase in trauma center availability up until the end of the period of study, 2002.[20] There are innumerable reasons to account for this abrupt transformation: fading trauma medical staff support, a shortage of physician specialists, undesirable lifestyle, malpractice premium escalation, and inadequate trauma center funding (cost shifting to support trauma is no longer a viable option as many Medical Centers operate on thin profit margins at best). Medicare does not adequately cover high stand-by costs, poor reimbursement under many State Medicaid programs; and the complex care that requires high consumption of technology and resources).[21-23] The above facts were further compounded by the adverse financial effects of large undetermined numbers of uninsured patients, and lastly, the nationwide development of trauma centers which were attended by a discordant process with apparent opposition by State Hospital Associations. The closure of these trauma centers led to a shift of care to generally, ill-equipped small, rural, community hospitals. This challenges the system even further, by limiting the ability to transfer patients to a definitive care ACoS level II or I trauma center, in addition to taxing the limited resources many of these smaller hospitals possess.

Some authors have published data comprising single institutional experience that demonstrate that trauma programs may contribute positively to hospital net revenue, acknowledging that this may be biased to a large degree by third party payer mix of an institution, as this is generally not the experience nationwide.[24,25] Economic assessments of trauma centers in the United States reveal that losses are on the order of 14% of operating expenses. Collectively, nationwide trauma centers will experience a loss of about one billion dollars![19]

Hawai'i's State of Affairs

The State of Hawai'i is experiencing similar challenges. Motor vehicle crashes comprised the primary cause of unintentional injury deaths in the State between 1996–2000.[26,27] After suicide, occupants of motor vehicle accidents, falls, homicide, and drownings were the top

four leading causes of fatal injuries among Hawai'i residents in 1996–2000. There is only one ACoS-verified level II trauma center in the State, on the Island of Oahu. The number of annual admissions to this Center has been increasing with an upward trend of Neighbor Island transfers.[28] Although the proportion of blunt and penetrating trauma has remained stable, the number of patients who require operative intervention has increased from 793 in 2001 to 1755 in 2003, and over 1000 during the first half of 2004. Accompanying this trend is the expected increase in the mean Injury Severity Score of patients admitted to the trauma center, which is indicative of complex, higher acuity level patients with more severe injuries. The trauma center projects a financial loss of $6 million over the course of the current year.[29] This number is expected to increase, based on current volume statistics. This is emblematic of an inherent referral bias, where the sickest patients who require high cost care are channeled to a definitive care trauma facility. In the absence of stable funding and support, this threatens the viability of such a facility, exemplified by the recent closure of several trauma centers in the United States. Rural and urban areas have both been impacted.

The lack of a coordinated trauma system abrogates the ability to provide the best care for the injured, and further undermines the ability to respond to mass casualties resulting from natural disasters and bioterrorism. Geographical isolation adds another dimension to the preparation for such calamities with the nearest State more than 2,000 miles away. Assistance would not be immediately available. Local resource coordination and management will be imperative in a disaster. The 1995 Oklahoma City terror attack, the events of September 11, 2001, Katrina and Rita, are prototypes that underscore the crucial role of trauma centers and equipped trauma systems in emergency preparedness. This is a public safety issue and must be dealt with by leaders from the Federal, State, and County governments, Legislators, Healthcare Providers, Health Insurers, Professional Liability Carriers, and Advocacy Groups. The Federal Government will be a key participant with recognition of trauma care as integrally involved with any terrorist threat.

Conclusion

A few States (Texas, Maryland, California, Washington, Mississippi, and Oklahoma) have inaugurated legislative support for trauma care (with collaborative input from a broad array of constituents involved in the delivery of trauma care) by establishing the foundation for the development of stable funding sources, specialty physician recruitment and retention, and tort reform. Appropriate and compulsory public policy must be formulated to address the need to assemble the requisite infrastructure for a well-designed trauma system. Such action will ultimately enhance and solidify Hawai'i's ability to prepare for any catastrophic occurrence that may present itself in the very near future, assuring public safety as an inalienable right.

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Pacific Tracker (PacTrac): An Interactive Dietary Assessment Program at the CRCH Website

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Cancer Research Center of Hawai'i, Department of Human Nutrition, Food and Animal Sciences, University of Hawai'i

A new dietary assessment program is now available at the Cancer Research Center of Hawai'i's website: http://pactrac.crch.Hawai'i.edu. The Pacific Tracker (PacTrac) is a user-friendly, web-based program that can be used to evaluate the diets of Pacific Island populations. It is a modified version of the Interactive Healthy Eating Index (IHEI), developed by the U.S. Department of Agriculture.[1] The food list for the program was extended to contain local foods for Hawai'i, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI), using a food composition table developed by the Nutrition Support Shared Resource of the CRCH.

For the data collection component, users enter the foods consumed in a day, along with the portion sizes for each. PacTrac also has an informative evaluation component which provides nutrition education to users by evaluating the person's dietary intake using national dietary recommendations. A physical activity component provides an evaluation of daily energy expenditure based on the types and duration of activities performed during the day.

Entering dietary data using PacTrac

PacTrac may be used by both health professionals and the public. A user goes to the PacTrac website and logs into the system by creating a user ID. Then a choice is made between entering dietary data or physical activity data. For dietary data, food items are entered one at a time until all foods consumed during the day have been specified. Food names are selected from an extensive list using a word search feature. For each food item, portions consumed may be entered using a choice of food measures (e.g., cup, slice, or ounce), plus a specification of how many of these food measures were consumed (e.g., two cups of milk). This process continues until all food items consumed during a day have been entered.

Dietary evaluations provided by PacTrac

After all food items have been specified, PacTrac provides the user with feedback on the quality of the one-day diet. Four types of evaluation may be performed:

- The nutrient content of the diet: Intakes of 25 nutrients are shown, along with a comparison to recommended intake information for each.
- A comparison of how the diet adheres to the USDA Food Guide Pyramid (FGP).[2] The recommended FGP is shown, plus the user's actual FGP sized according to the number of servings of each food group that was contained in the diet that the user entered. For example, if the individual reported eating less than the recommended servings of grains, then the grain section of his FGP would be proportionally smaller compared to the grain section of the standard FGP.
- A score related to components of the Healthy Eating Index (HEI): The HEI score has ten components, including adherence to each of the five FGP recommendations (grain, vegetable, fruit, milk, and meat), and compliance with recommendations for percent of calories from total fat and saturated fat, amount of dietary cholesterol, sodium intake, and dietary variety. More information about each of the HEI components can be obtained by clicking on the emoticon (face) that is displayed next to the score for each component. (See Figure 1)
- A Healthy Eating History: It is possible for the user to track the HEI score for up to 20 days to assess any changes over time. PacTrac displays graphs of these scores.

Sources of Food Composition Data

The CRCH food composition table provides data for nutrients in over 2500 foods. In addition, the servings of six food groups, corresponding to the Food Guide Pyramid food groups,[2] are available for each food on the database. The data come from the US Department of Agriculture Standard Reference Database, release 16.1,[3] as well as from various international and commercial publications. In addition, selected local foods are analyzed in the laboratory to obtain estimated values for some nutrients. For mixtures, recipes are developed using data from USDA, as well as information from local cookbooks.

When expanding the PacTrac food list for use in other Pacific Islands, two primary resources are being used for the composition data. Recent analytical data for Pacific Island foods are available from Dignan et al.[4] Recipe data for mixtures in Guam have been compiled by the University of Guam Extension Service[5]. Typical recipes for CNMI have also been collected by the College of the Northern Marianas Extension staff in collaboration with the Healthy Living in the Pacific Islands Coalition.[6]

Figure 1.— **An example of the HEI score displayed by the PacTrac program**

PacTrac and MyPyramid

PacTrac is a modified version of the IHEI, which was written before the latest revision of the USDA Food Guide Pyramid, now called MyPyramid.[7] Minor changes have been made to the food groups that constitute both versions of the Pyramid, and to the way the recommended amounts are stated (now in cups and ounces per day, rather than in servings per day). An interactive dietary assessment program, MyPyramid Tracker, is now available at www.mypyramid.gov. The MyPyramid Tracker is similar to both the original IHEI, and to PacTrac, in the dietary evaluations it performs. Like the IHEI, the foods that a user can select are from the US national surveys, which may not be as relevant for diets in Hawai'i and other Pacific Islands as the foods available in the PacTrac program.

Physical activity evaluations

Data on physical activity may also be entered using the PacTrac program. The approach is similar to that used for dietary data: the name of each activity is chosen, and the amount of time spent on the activity is specified. PacTrac then provides an evaluation of the amount of energy (in kilocalories) that was expended during the day. This estimate of energy needs can then be compared to the estimate of energy intake (also in kilocalories) that is provided by the dietary assessment component of PacTrac. A physical activity score is also computed. A physical activity history is available, and can track scores for up to 20 days.

Future Plans for PacTrac

Initial updates to the PacTrac program have been completed, and the food composition database and the supporting databases have been updated to include all foods and recipes from the appropriate CRCH databases. These updates are continuing, and will include foods consumed in other Pacific Island locations in the future. Eventually, the comparisons to the Food Guide Pyramid will be replaced by comparisons to MyPyramid, along with updates to the recommended amounts from each of the food groups. New versions of the PacTrac system will continue to be available through the CRCH website (http://pactrac.crch.Hawai'i.edu).

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LIVER TRANSPLANT

has cautiously accepted donors from other centers on the mainland, but only in dire situations and with careful coordination of procurement times and airline flights in order to minimize ischemic time.

In order to maintain surgical skills, these surgeons perform many other complex hepatobiliary procedures, kidney and pancreas transplants, general surgery, and vascular access for hemodialysis. Hospital/operative nursing staff regularly cares for other complex oncologic, hepatobiliary and cardiac procedures. Transplant coordinators are certified by the National Association of Transplant Coordinators Organization (NATCO) and although they have a primary organ (kidney/pancreas, liver, heart) focus, they have been trained enough to cross-cover during the evenings and weekends.

Another strategy for achieving quality is emphasis on excellent long-term follow-up of transplant patients. Seventy-two of 79 patients who are currently alive are followed by their primary care physician and seen regularly (at least every 3 months, long-term) in the transplant clinic. This continued follow-up gives the ability to reinforce the importance of medication compliance, abstinence from alcohol, and long-term surveillance for unique post-transplant problems. Patients have long-term access to the St. Francis transplant coordinator, social worker and financial counselor for issues regarding medication costs, vocational training and insurance.

With these strategies to maintain skills and quality, St. Francis has been able to sustain a low-volume liver transplant center.[13] Survival is comparable to the national database of 200,000 transplant patients –the Scientific Registry of Transplant Recipients (SRTR), which indicates that the 1, 3, and 5 yr survival following LT is 81%, 72%, and 64% respectively.[12] All potential transplant candidates are informed of the Center's results and are given the option of choosing a mainland center. Because of distance, cost, and social support system, most choose to remain in Hawai'i. Our smaller program has required a longer period of evolution, in order to overcome unique barriers, but it is able to provide a service for a geographically-isolated population that would otherwise have limited opportunity for liver transplantation.

Acknowledgements

We would like to thank all of the transplant staff and nurse transplant coordinators both past and present. Without their efforts, transplant would not be possible.

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RARE TUMOR

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EOSINOPHILIC MENINGITIS? CONSIDER ANGIOSTRONGYLIASIS

REPORT TO THE HAWAII DEPARTMENT OF HEALTH DISEASE INVESTIGATION BRANCH

Oahu 586-4586 Maui 984-8213 Hilo 933-0912 Kona 322-4877 Kauai 241-3563

Background:

In response to recent reported cases of eosinophilic meningitis attributed to angiostrongyliasis, Hawaii Department of Health added eosinophilic meningitis to the reportable diseases list in January 2005.

Etiology:

Angiostrongyliasis is caused by ingestion of the rat lung worm parasite *Angiostrongylus cantonensis*, the most common cause of eosinophilic meningitis/meningoencephalitis in humans. Presence of this parasite has been documented in various Hawaiian snail and slug species since the 1960's.

Mode of transmission:

Consumption of raw or undercooked snails, slugs, prawns, land crabs, and lettuce or other leafy vegetables contaminated with the third-stage larvae of *A. cantonensis*. Not spread person-to-person.

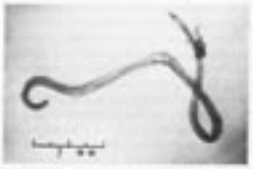

Fig. 10. Magnification of a live young adult female worm (2.3, 13 mm long) obtained from CSF.

Symptoms:

- Meningitis and paresthesias related to larval migration to the brain.
- Asymptomatic or mild symptoms of limited duration.
- Symptom duration may be days to months.

Onset:

Usually 1–3 weeks after exposure to the parasite.

Diagnosis:

Based on epidemiological history, clinical presentation, and laboratory evidence of eosinophilic meningitis. There is no reliable diagnostic laboratory test.

Differential diagnosis: cerebral cysticercosis; paragonimiasis; echinococcosis; gnathostomiasis; tuberculous, coccidioidal, or aseptic meningitis; and neurosyphilis.

Treatment:

Supportive care and pain control are mainstay. Steroid therapy helpful for some. Disease is self-limited as parasite dies over time.

Prevention & advice for patients:

- Do not to consume raw foods potentially contaminated with snails or slugs.
- All herbs and produce should be washed thoroughly. However ingestion of washed herbs and produce known to have been contaminated may still put patients at risk.
- Wear gloves when handling mollusks, and wash hands thoroughly afterwards.
- Boil all snails, prawns, fishes and crabs for least 3–5 minutes, or freeze at 5°F (15°C) for at least 24 hours to kill the infective larval stage of the worm.

For more information, see the CDC's website at http://www.cdc.gov/ncidod/dpd/parasites/angiostrongylus/factsht_angiostrongylus.htm

UPCOMING CME EVENTS

Date	Specialty	Sponsor	Location	Meeting Topic	Contact
June 2006					
6/11-6/15	C	University of California, Davis	Fairmont Orchid, Kohala Coast	Update of the Management of Thromboembolic Disorders	Tel: (916) 734-5390 Web: cme.ucdavis.edu
6/15-6/18	GS	University of California, San Francisco	Kahala Mandarin Oriental, Honolulu	UCSF Innovations in Medical and Surgical Care Conference	Tel: (415) 476-5808 Web: www.cme.ucsf.edu
6/21-6/24	ID	University of California, Davis	Ritz-Carlton Hotel, Kapalua, Maui	Emerging Infectious Diseases	Tel: (916) 734-5390 Web: cme.ucdavis.edu
6/22-6/24	OBG	American College of Obstetricians and Gynecologists	Fairmont Orchid, Kohala Coast	The Art of Clinical Obstetrics	Tel: (800) 638-8444 x2540 Web: www.acog.org
6/25-6/27	Multi	John A Burns School of Medicine, University of Hawai'i	Hawai'i Convention Center, Honolulu	2nd Annual Hawai'i BioScience Conference: The Molecular Basis of Disease	Web: www.hibiosci.org
6/25-7/1	PD	University Childrens Medical Group	Hyatt Regency Maui Resort, Maui	Pediatrics in the Islands… Clinical Pearls 2006	Tel: (800) 354-3263 Web: www.ucmg.org/cme.html
6/26 - 6/29	ON	UT M.D. Anderson Cancer Center	Princeville Resort, Princeville, Kauai	2nd Annual Symposium	Tel: (713) 792-2223
July 2006					
7/2-7/7	OBG	University of California, San Francisco	Hapuna Beach Prince Hotel, Kohala Coast	Essentials of Women's Health: An Integrated Approach to Primary Care and Office Gynecology	Tel: (415) 476-5808 Web: www.cme.ucsf.edu
7/23-7/29	OS	Department of Orthopaedic Surgery, Kaiser Honolulu	Grand Hyatt Resort, Poipu, Kauai	14th Annual Update in Orthopaedic Surgery, Hawai'i 2006	Tel: (808) 432-2243
7/23-7/27	ORS	North American Spine Society	Ritz-Carlton, Kapalua, Maui	Spine Across the Sea	Tel: (877) 774-6337 Web: www.spine.org
August 2006					
8/12-8/13	OBG	Department of Obstetrics & Gynecology, John A. Burns School of Medicine	Kaakako Medical Education Building -- Auditorium 2nd Floor, JABSOM	Obstetrics and Gynecology Coding Conference	Tel: (808) 203-6528
8/17-8/18	Multi	St. Francis Medical Center -- Liliha	St. Francis Medical Center -- Liliha	Medical Malpractice: Understanding the Law, Managing the Risk	Tel: (808) 547-6140
8/24-8/25	Multi	Kaiser Permanente	Hawai'i Prince Hotel, Honolulu	5th Annual Pain Management Symposium	Tel: (808) 432-7932
September 2006					
9/21-9/22	Multi	Kaiser Permanente	Radisson Prince Kuhio	Palliative Care: An Interdisciplinary Approach	Tel: (808) 432-7932
October 2006					
10/12-10/16	R, N	Western Neuroradiological Society	Fairmont Orchid, Kohala Coast	38th Annual Meeting	Tel: (630)574-0220 x226 Web: www.wnrs.org
10/20-10-22	Multi	Hawai'i Medical Association	Hawai'i Convention Center, Honolulu	2006 Annual Meeting; Leading the Way: Building on 150 Years of Service	Tel: (808) 536-7702 Web: www.hmaonline.net
10/22-10/27	U	Western Section of the American Association of Urology	Hyatt Regency Resort, Maui	82nd Annual Meeting	Tel: (714) 550-9155 Web: www.wsau.org
November 2006					
11/5-11/10	Multi	Kaiser Permanente	Wailea Marriott Resort	Evidence-Based Medicine Conference: The Essentials	Tel: (808) 432-7932

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

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When: Thursday, June 15, 2006, 6:00 pm
Wednesday, August 2, 2006, 6:00 pm

Where: HMA, 1360 S. Beretania Street, 2nd Floor, HMA Conference Room

Cost: FREE

Speaker: Jake Mater, PHRMA, State Government Relations Consultant

To register or for more information contact HMA at: (808) 536-7702

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Hawai'i's most established multi-specialty group of 400+ physicians recruiting for BC/BE internists for busy outpatient clinic and call, practice based in new Maui Lani clinic (affiliated with Maui Memorial Medical Center). We are also looking for several hospitalists to be based at the main medical center in Honolulu.

Positions immediately available. Applicant must have a commitment to quality care, patient advocacy, and involvement in patient and professional education. Competitive salary, excellent benefits, relocation assistance and more. Send CV to: Physician Recruitment, HPMG Administration, 501 Alakawa Street, Suite 255, Honolulu, HI 96817-5764. email: **Thao.Hartford@kp.org**, FAX **(808) 432-4620**. EOE.

PHYSICIAN NEEDED

PART-TIME PHYSICIAN NEEDED: The Honolulu Military Entrance Processing Station is recruiting a Physician for an on-call position. Duties will involve conducting medical qualification examinations on applicants for the Armed Forces. Looking for M.D. or D.O., any specialty. Individuals applying will be subject to a credentials review and must possess a valid, current, unrestricted license. If you are looking for a unique opportunity to be part of our team, send your C.V. to: **John Kusterman, M.D., at honcmo@mepcom.army.mil or call at (808 471-8725), ext 220.**

PHYSICIAN WANTED

RADIANT RESEARCH HONOLULU is a stand alone research facility which focuses on Phase I/II studies predominately in health volunteers and ambulatory patients. We are a leading US site for Japanese PK bridging studies.

We are seeking a Physician who will be responsible for the oversight and safety of designated research studies. This includes consenting, medical history, ECG's, physicals, assessments, safety and data review. Must have good written skills and the ability to provide critical input on protocol design/development. Must have the ability to interface with pharmaceutical sponsors and work in a team environment. We require a BC or BCE MD eligible in a primary care specialty, i.e., family practice, internal medicine, with at least 3 years of clinical medical experience, and obtain a Hawai'i medical license. Clinical research experience and bilingual Japanese/American is preferred. M-F schedule, weekends as necessary. **Please send resume to mark-jacobs@radiantresearch.com or call 808-441-6312. EOE.**

❖ NEVER HAVE A DISEASE YOU CAN'T AFFORD.
Every ophthalmologist who has cared for a patient with a fungus eye infection shudders at the thought. Prolonged medication is necessary, desperate cases may require surgery, and scarring can cause blindness. Now it appears that an outbreak of Fusarium corneal infections are related to an eye solution produced by *Bausch and Lomb*. The topical preparation ReNu with MoistureLoc was associated with 28 of 30 cases of Fusarium keratitis in contact lens patients, and these are being studied by the Center for Disease Control and Prevention (CDC). B&L has suspended shipment of the compound, and intensive study is underway. Overall, a total of 109 cases in seventeen states are being evaluated by health authorities, and a cloud of legal vultures is forming over Bausch and Lomb. No doubt a class action suit will ensue.

❖ THE RIGHT HAND NEEDS TO KNOW WHAT THE LEFT IS DOING.
Hand washing between caring for patients ought to be a given, but not so. In response to 90,000 infection-caused hospital deaths each year, the Center for Disease Control and Prevention has launched a program with rigorous guidelines to boost compliance. An outbreak of MRSA (methicillin resistant Staph aureus) in two hospitals in Kentucky was found to be caused by doctors and staff not bothering with basic hand-hygiene. Even with alcohol-based hand dispensers in each room, studies show that hospital personnel typically used the dispenser only 40% to 50% of the time. Now the CDC in cooperation with the Institute for Health Improvement is holding hospital administrators and staff accountable with aggressive surveillance and monitoring. With staff monitors to observe workers and punitive measures for repeat offenders, compliance has improved from 80% to 95%. Obviously, big brother measures do not create a warm atmosphere with the staff, but as Semmelweis proved 160 years ago, dirty hands are killers.

❖ IF YOU MAKE THE MISTAKE OF GROWING OLDER, YOU BEGIN THE DAY WITH COFFEE AND OBITUARIES.
Research reported in the Beaver Dam Study at the University of Wisconsin School of Medicine and Public Health was conducted to evaluate life expectancy related to visual degenerative eye disease. A population of approximately 6000 ranging from 43 to 84 years of age was studied with adjustments for age, gender, life style and systemic factors. Glaucoma and age-related macular degeneration showed no relation to mortality. Contrarily, cataracts and diabetes patients showed poorer longevity, and it may be that they serve as markers for mortality in the general population.

❖ TV EVANGELISTS ARE THE PRO WRESTLERS OF RELIGION.
A careful study of 1802 post heart bypass patients was conducted by a Harvard group, specifically to determine the effects of prayer on distant patients. The data were collected from six hospitals, and the findings published in the April 4 edition of the American Heart Journal. The research team emphasized that the study did not intend to test the existence of God nor to evaluate other forms of prayer, such as praying at the bedside by loved ones or friends. The rate of complications (most commonly arrhythmia) was about 52%, in both those prayed-for or not, and one prayed-for cohort actually had 59% complications. Researchers theorized that knowing they were being prayed for may have produced stress ("Wow! I'm so sick they called in the prayer team."). The John Templeton Foundation provided most of the $2.4 million to fund the study, primarily to sort out conflicting past research which was deeply flawed.

❖ THE SICK ONES KILL THE HEALTHY ONES.
It has long been recognized that caring for a seriously ill loved one is a life threatening job. A new study in the New England Journal of Medicine attempted to quantify the effect of stress on a spouse caring for a seriously ill mate. Researchers collected Medicare data from 518,000 couples who were 65 or older on January 1, 1993, and charted the first hospital admission of each spouse thereafter. They followed by tracking medical data on the pair for the next nine years, during which half the people died. The greatest risk comes from a spouse with dementia, psychiatric disease or congestive heart failure. Caring for an Alzheimer's spouse increased a male care-givers death risk by 22%, and a female by 28%; psychiatric illness, especially depression, increased the risk for men by 19% and women 32%. The most dangerous period is the first month after the spouse was hospitalized, perhaps adjusting to bathing and feeding, managing household chores and finances. The urgency for more geriatric care becomes evident with the expectation that 20% of the population will be 85 years and beyond in 20 years. Unfortunately, Medicare reimbursement being what it is, young doctors look at other fields of practice, so geriatric residency slots are going begging at universities.

❖ SHE PASSED THE PREGNANCY TEST WITHOUT EVEN STUDYING.
In Phoenix, Arizona, a police officer ticketed a woman for driving alone in the high-occupancy-vehicle lane on the Interstate. The driver pointed to her gravid abdomen and claimed the fetus she was carrying represented another occupant in her car. The officer wrote a ticket anyway and she was fined $367. The *Arizona Right to Life* club saw an opportunity to make a case and supported the driver, claiming that just because the officer could not see the other person, nevertheless another person was present. The wise municipal court judge saw a possible thorny issue, ruled against the driver, and issued a "common sense" decision that the "law is meant to fill empty space in a vehicle," and that for fast lane purposes each person would occupy a separate and distinct space in the car.

❖ IF YOU SCORED C+ OR HIGHER IN BIO-MEDICAL ETHICS, DO NOT COMPLETE THE APPLICATION FORM.
No matter how the board of directors of United Health Group Inc. rationalize paying their CEO millions in cash, stock options and multiple perks, doctors laboring in the trenches cannot accept this behavior as either fair or appropriate. William McGuire M.D. quit his medical practice as a pulmonologist in 1986 and switched to HMO management. Today he is the CEO of United Health and is paid $8 million a year in salary and bonuses, and given multiple generous stock option awards. His net worth is over $1.6 billion. "We're so lucky to have Bill," gushed Mary Mundinger, a corporate director. "He's brilliant." Yes, what a guy! Ever since medical practice moved from a cottage industry to a corporate one, doctors have felt the squeeze of increasing demands to save money in their practices while they watched the medical corporations grow like topsy. Corporate offices have grown exponentially, tentacles have spread across hospitals and clinics, investors skim off dividends, and CEOs receive incomes in multiple factors compared to their doctor laborers. What a medical care system! In the vernacular, IT SUCKS!

❖ IT'S THE RECREATIONAL DRUG OF THE NEW MILLENNIUM. -H. Hefner
Two undercover Chicago narcotics officers were approached by an illicit drug salesman in the stairwell of the Division Street CTA Red Line station. He offered the narcs a fix for $5 a pill, according to court records. When the officers agreed, he got a medicine bottle from his jacket pocket and poured several blue pills into the officer's hand. At that point the officers arrested him, and according to the record, he had delivered 11 Viagra pills. The offender was charged with unlawful possession of a controlled substance, and held in lieu of $3,000 bail. He was obviously hard up.

❖ MAY YOUR SWASH NEVER BUCKLE!
Mark Cuban scored big-time with an internet company called Broadcast.com which he sold to Yahoo Inc. in 1999 for $5.7 billion. He bought the Dallas Mavericks basketball team but still has a lot of money to play with, so now he is investing in high tech toilet seats. Called *Swash*, the heated toilet seat has a warm water jet which cleans the user much like a bidet, the popular European bathroom fixture. A remote control switch activates an air dryer to complete the process. It's all yours for $429 a copy, but hey, cost would be partially offset by savings in toilet tissue. In Japan, where it is widely accepted, consumers like the facility, but so far in America the idea has not trickled down.

❖ IT PROBABLY WOULD HAVE BEEN OKAY IF THE CHEESE HAD NOT BEEN VELVEETA.
Catholic experts and theologians say that the grilled-cheese sandwich purported to bear the image of the Virgin Mary which sold for $28,000 on eBay last week, will probably not meet the church's criterion for divine apparition. **(Seattle Times)**

ADDENDA
❖Twenty-four people disappeared from cruise ships from 2003 to 2005.
❖It takes about 45 seconds of micro-waving to make a Twinkie explode.
❖If global warming were outlawed, only outlaws would warm their globes.

ALOHA AND KEEP THE FAITH — **rts**■

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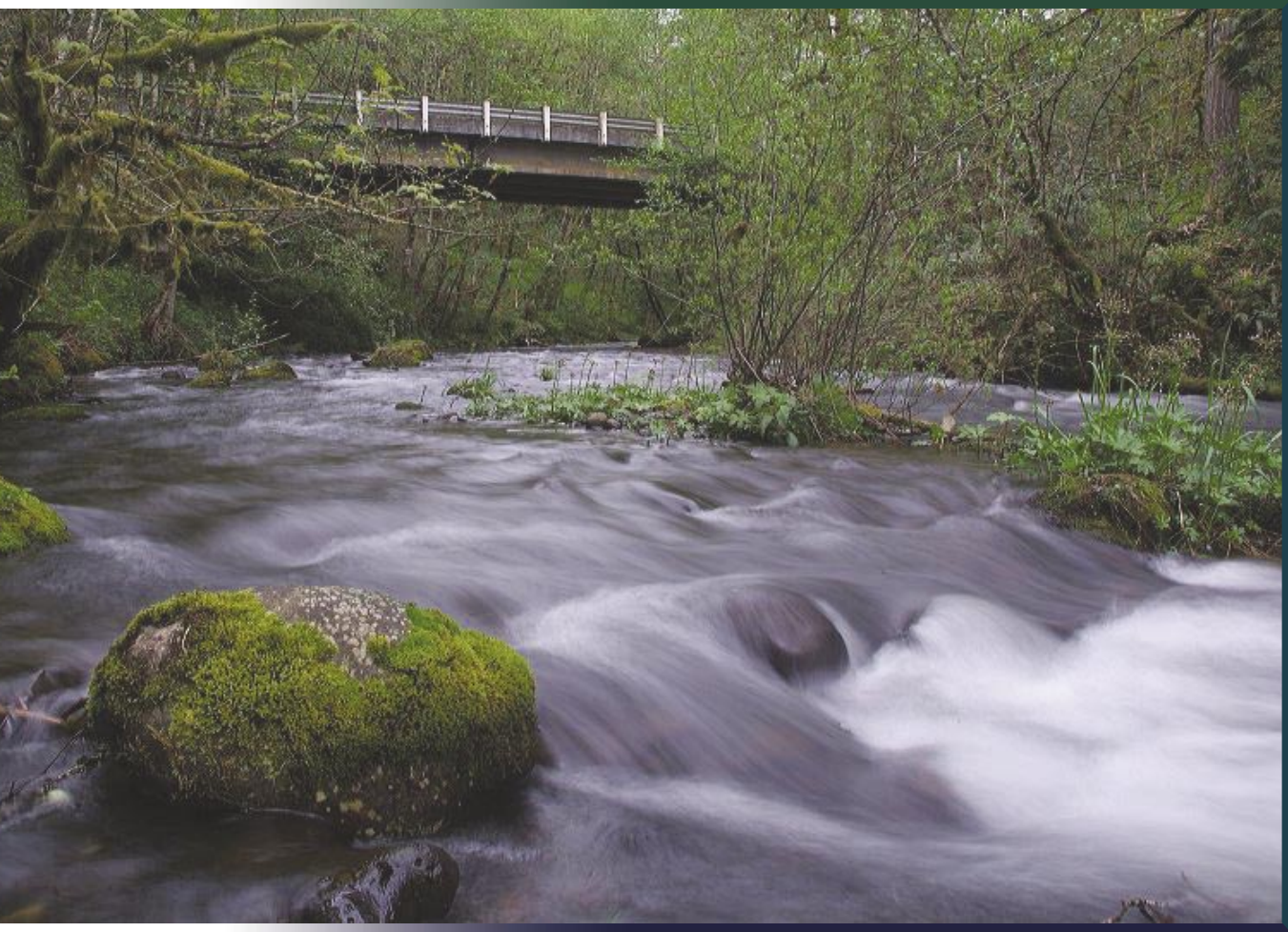

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