2-28-2013

Medical Tourism and International Healthcare Options

David Conley
Marshall University

Andrew Sikula Sr.
Marshall University, sikula@marshall.edu

William Willis
Marshall University, willis23@marshall.edu

Alberto Coustasse
Marshall University, coustassehen@marshall.edu

Recommended Citation
Conley, D., Sikula Sr., A., Willis, W., & Coustasse, A. (2013, February). Medical tourism and international healthcare options. Paper presented at the Business and Health Administration Association Annual Conference 2013, at the 49th Annual Midwest Business Administration Association International Conference, Chicago, IL.

MEDICAL TOURISM AND INTERNATIONAL HEALTHCARE OPTIONS

David Conley, MS
College of Business, Graduate School of Management
Marshall University
Tel: 304-746-1968
Fax: 304-746-2063
Conley85@live.marshall.edu

Andrew Sikula, Sr., Ph.D.
College of Business, Graduate School of Management
Marshall University
Tel: 304-746-1956
Fax: 304-746-2063
sikula@marshall.edu

William Willis, Dr.PH.
College of Business, Graduate School of Management
Marshall University
Tel: 304-746-8967
Fax: 304-746-2063
willis23@marshall.edu

Alberto Coustasse, Dr.PH. MD, MBA, MPH
College of Business, Graduate School of Management
Marshall University
Tel: 304-746-1968
Fax: 304-746-2063
coustassehen@marshall.edu

MEDICAL TOURISM AND INTERNATIONAL HEALTHCARE OPTIONS

David Conley, Marshall University
Andrew Sikula, Sr., Marshall University
William Willis, Marshall University
Alberto Coustasse, Marshall University

ABSTRACT

Medical tourism has evolved from traveling to the United States (U.S.) and a select few other countries, such as India and Thailand, to a global trend in affordable alternative healthcare. Medical tourism in the U.S. and in other countries has evolved because of cost and lengthy waiting periods. Some insurance companies are marketing kidney transplants and joint replacements through medical choice programs in order to save overall expense. As an economical approach to controlling rising health care costs in the U.S., medical tourism is becoming a valid alternative.

INTRODUCTION

During the recent past several decades, local healthcare costs have continued to rise placing an economic strain on many individuals throughout the world. It has been estimated that in 2000, the average person paid upwards of $315,000 throughout their lifetime to receive adequate insurance coverage in the United States (Alemayehu & Warner, 2004). Throughout history, those who have sought medical attention have traveled, sometimes to other countries, to receive what is considered as the best medical attention available. Some of these medical breakthroughs during the 19th and early 20th centuries ranged from vaccines for diphtheria, rabies and tetanus to the successful use of alternative surgeries (Pearson Education, 2007). Medical alternatives have not necessarily changed, but now instead of a person traveling to just the U.S., this practice is seen throughout the world, reaching many countries such as India, Brazil, Australia, Germany, Korea, Thailand Turkey and many more (Woodman, 2009).

In recent decades, many have sought medical treatment in countries other than their own for two main factors: time and cost. In these cases, citizens may travel to other developed and developing countries in an effort to receive treatment for a fraction of domestic expenses even when travel and host expenses are included (Eggerston, 2006). Also, the time that they can save may determine the outcome of a procedure and its overall expense. Physicians in countries that practice medical choice are generally U.S. Board Certified doctors, or the equivalent in other countries (Joint Commission, 2011).

Over 2.2 million persons traveled to India and Thailand in 2004 for healthcare and it has been estimated that approximately six million people did the same in 2010 to generate nearly $4.4 billion in revenue for countries that accept foreign medical transplants (Horowitz, Rosensweig & Jones, 2007). According to Sachdeva & Sachdeva (2010), the average heart bypass in the U.S. cost approximately $133,000 while in India it costs an average of $7,000.

Some insurance companies are encouraging foreign medical alternatives as part of standard medical healthcare insurance programs. Blue Cross Blue Shield has enabled those covered by their programs in Florida and Wisconsin eligibility to consider off-shore medical facilities as a low-cost alternative (Keckley, 2009). In this practice, some of the personal costs have been waived such as airfares and deductibles (Horowitz, et. al., 2007).

Similarly, in California, Blue Shield has several programs in place to assist patients of global medical operations and practices. They have been allowed access to physicians in Mexico as part of their health plans (Hansen, 2008). Such plans are geared largely towards Mexican Americans, and account for nearly 20,000 patients (Black, 2008). South Carolina's Blue Cross Blue Shield policy holders are able to seek treatment at Bumrungrad International Hospital in Thailand, which is accredited by the Joint Commission International (J.C.I). In 2007, this hospital treated approximately 400,000 foreigners including about 80,000 Americans (Hansen, 2008).

Bumrungrad International Hospital (BIH), which is in Bangkok, Thailand, includes about 200 U.S. Board-Certified physicians and more than 900 nurses, clinicians and therapists, many of whom hold licensures in Europe, Australia, or Japan (Bumrungrad International Hospital, 2011). BIH staff help patients with travel arrangements, housing, and assistance such as interpreters and other arrangements. Unlike typical health insurance policies and payout procedures in the U.S., approximately 75% of patients pay directly for services rather than receiving financing through insurance (Herrick, 2007).

Introduced in 2007, Colorado General Assembly 07-1143 proposed to establish incentives for employees covered by state health insurance programs to seek medical care from foreign health centers for a lower cost (*CO 07-1143 2007*). This bill established some of the same motivations as a West Virginia House Bill (HB) 2841, although it was never formally approved and was indefinitely tabled by the House Committee on Business Affairs and Labor. For some years, medical tourism has been proposed on a state-by-state basis, and while neither of these legislative bills passed committee scrutiny, group state insurance plans are beginning to consider foreign medical off-shore alternatives as a cost/benefit choice of their patrons (Keckley, 2009).

As stated previously, West Virginia, as recent as 2007, considered legislation, West Virginia H.B. 2841, which provided financial incentives to state employees who volunteered to travel to off-shore medical destinations outside the U.S. that were accredited by the J.C.I. The bill specifically would have waived co-pays and deductibles, reimbursed for round-trip airfare and lodging for the employee and one companion, allowed seven days sick leave, and a 20% cost savings rebate. However, this bill died in committee and was not approved (*WV HB 2841* 2007: Keckley, 2009).

In Canada, the practice of foreign medical choice has been part of the Canadian nationalized healthcare system for many years. More than 15 government approved travel agencies promote medical tourism as a mainstay in Canadian healthcare, some of which includes patients to the U.S. (Johnston, et. al., 2011). Some entrepreneurial companies have specialized in medical tourism and have sent clients all over the world for procedures ranging from cosmetic surgeries and fertilization treatment to cancer therapies and kidney transplants (Turner, 2007). Partnerships throughout the world have expanded to certain medical facilities including a Vancouver agency directing patients to Thailand while a competitor in Quebec prefers accommodations in India (Turner, 2007).

The purpose of this study was to determine the economic benefits of foreign medical choice alternative venues and how U.S. citizens can use this practice to successfully lower the total cost of healthcare.

METHODOLOGY

The methodology for this literature review was conducted using a systematic search of key words that are related to the content of medical tourism, or medical practices that accept international patients for non-elective surgeries. The terms used for the research were "medical tourism," or "international medical practices," or "off-shore medical destinations," or "heart care cost," or "renal transplant," and "joint replacement." Publications that were either written or translated in English were used and the search was limited to the last 25 years. For this literature review, three procedures, namely, renal replacement, Coronary Artery Bypass Graft (CABG), and joint replacement (specifically hip and knee replacements) were examined for their economic value and how such off-shore medical choices have evolved into common practice today.

To identify articles that were relevant, several databases were used to search for writings pertaining to this literature review and included PubMed, Marshall University and Alderson Broadus College library's online journals. Other databases included Google Scholar, the World Health Organization, Indian Journal of Community Medicine, the Joint Commission International, the New England Journal of Medicine, Medscape General Medicine, Canadian Family Physician, Health Affairs, Institute of Public Affairs, National Center for Policy Analysis, along with other medical search engines and websites.

The literature review yielded 37 articles which were assessed for information pertaining to this research project. Fifteen articles were used in the results section. Reviews, commentaries and editorials were used as well as primary and secondary data. The literature search was conducted by co-authors DC and DL and validated by AC and AS.

RESULTS

Comparing Kidney Transplant Surgery in the U.S. vs. India

Patients in the past that have used off-shore medical tourism for cosmetic surgery, joint replacement, and other medical procedures in order to have them performed at less expense. Whether the person had insurance with limited coverage or was not insured, all patients who performed healthcare procedures abroad did so because of reduced cost (Milstein & Smith, 2006). There are many healthcare procedures that can be considered as non-elective surgeries such as a kidney transplant for individuals who have End Stage Renal Disease (ESRD), and are in desperate need of a kidney transplantation (Cardoen, Demeulemeester, & Beli¨en, 2008).

Individuals diagnosed with ESRD in the U.S. have three choices of treatment: (1) hemodialysis (2) peritoneal dialysis, and (3) kidney transplantation (Moeller, Gioberge, & Brown, 2002). Patients with ESRD that seek treatment by dialysis will have to remain on dialysis until a donor kidney is located for them. Seeking foreign treatment can be very expensive, for both the individual as well as for the insurance companies (Moeller, et al., 2002). In 2007, 527,283 U.S. residents were under treatment as of the end of the calendar year (National Kidney and Urologic Diseases Information Clearinghouse, 2010). On the other hand, seeking domestic treatment for ESRD via a kidney transplant is also a very expensive treatment option in the US. The U.S. Renal Data System (USRDS) has stated that the U. S. performs 45-50 kidney transplants per million people every year. This is one of the highest rates in the world (Friedlaender, 2002). The U.S. has performed more kidney transplants than any other nation and shows a high quality of care among recipients (Friedlaender, 2002).

Since a kidney transplant can be considered as non-elective surgery, patients can use medical tourism to receive treatment for ESRD. ESRD is a problem in the U.S. with 83,950 people awaiting a suitable kidney transplant in May 2010 (NKUDIC, 2010). With only 13,743 kidney transplants actually performed in 2008, there is much more demand than supply (National Organ Procurement and Transplantation Network, 2009). The large gap between the supply and the demand of kidney transplants in the U.S. means that it may be faster and more cost efficient for a potential kidney transplant patient to travel abroad (Sheehy, Conrad, Brigham, Luskin, & Weber, 2003).

Dheeraj Bojwani Consultants is an example of a medical tourism company in India. This company arranges medical trips for people who are seeking low cost surgery in India. Dheeraj Bojwani Consultants has recently launched their latest marketing technique, a kidney transplant surgery (Dheeraj Bojwani Consultants, 2011). Dheeraj Bojwani offers a full package deal for the patient and a spouse to make the entire trip easier on the patient. When a patient receives treatment, including both before and after the operational procedures, the spouse or caregiver is also given accommodations that are similar to a vacation. Although the expenses for these all inclusive medical tourism trips vary, the cost of a kidney transplant in India is anywhere from $13,000 to $30,000 (Aarex India, 2006).

Table 1. Appendix A.

In an article published in *The New York Times* in 2009 (Sack, 2009), the Center for Medicare and Medicaid Services (CMS) reported paying $100,000 or more for kidney transplants and services for patients that are effected by ESRD. CMS does in fact pay for these services with an annual price tag of approximately $23 billion. This cost includes the cost of the surgery and anti-rejection medication for up to 36 months per transplant. Anti-rejection drugs cost anywhere from $1,000 to $3,000 U.S. dollars per month (Sack, 2009). Typical charges for a dialysis patient, which are also covered by the CMS, can range up to $9,300 a month. The average expenses for yearly dialysis treatments are $71,000 compared to $106,000 for a transplant, which includes monitoring for 12 months after the procedure (Sack, 2009). These costs do not include additional fees structured by individual hospitals and medical facilities which can exceed an additional $150,000 for a total expense of over $250,000 (Table 1).

In India, however, typical costs for the entire procedure of a kidney transplant average $10,000 U.S. dollars which include all hospital charges and medication expenses for the first 12 to 18 months when done at a public hospital. At a privatized hospital, costs for the initial services could average up to 60% more, although the cost of medication is relatively the same (Sakhuja & Sud, 2003).With companies such as Dheeraj Bojwani Consultants offering medical tourism trips to India for a variety or healthcare procedures, it is no wonder that it is now offering kidney transplantation surgery as an option for ERSD patients in the U.S. and Europe (Dheeraj Bojwani Consultants, 2011). Given that the data have shown it can be economically beneficial to the patient and their families if they seek kidney transplant abroad, a potential patient then has to question the quality and safety of the foreign care rendered (Kher, 2006).

Medical Tourism and Cardiac Procedures

The American Heart Association asserts that Cardio Vascular Disease (CVD) in the U.S. has claimed 831,272 lives in 2006 (American Heart Association [AHA], 2011). CVD did account for 34.3 % of all deaths or 1 of every 2.9 deaths in 2006. Furthermore, the AHA estimates that, in 2006, there were 81.1 million people in the U.S. who have had one or more forms of CVD. Expenses have been recorded with a high of $210,842 for the cost of heart bypass surgery, in the U.S. in 2006, whereas in India the total expenditure is $10,000 (Table 2).

Table 2. Appendix A.

With the U.S. having a large number of people having CVD, plus high expenditures associated with this large number of surgeries having been performed in previous years, it could be assumed that the cost of such procedures would be comparable to or lower than other countries around the world offering the same procedures. In fact, based upon figures obtained through the National Center for Policy Analysis, a person could have received cardiac surgery in countries such as India, Thailand, and Singapore for a fraction of the cost in the U.S. The average cost of cardiac surgery in India was $10,000; in Thailand it was $12,000; and in Singapore the total expense is $20,000 (Table 2).

Another company, similar to Dheeraj Bojwani Consultants, Tours 2 India 4 Health, Inc. focuses on matching potential patients from other nations with Indian physicians for certain services. The physicians working in this company have been trained or have worked in some of the best medical institutions in the U. S., United Kingdom, Europe, and other countries across the globe (tours2india4health.com 2011). There are a large number of J.C.I. accredited hospitals in India where foreigners are receiving cardiac procedures (Milstein & Smith, 2006).

Medical Tourism and Joint Replacement

In 2009, more than 193,000 total hip replacements were performed in the U.S. (American Academy of Orthopedic Surgeons, [AAOS], 2009). Approximately 581,000 knee replacements were performed in the same year in the U.S. (AAOS, 2009). In 2003, more than 638,000 hip or knee replacement surgeries were done (AAOS, 2007). These hip and knee replacement surgical procedures cost insurance companies on average $75,399 and $69,991, respectively (Table 2). Joint replacement is not as prevalent and life limiting as some of the other medical operations previously discussed, but for a patient with osteoarthritis, for example, a hip or knee surgery might be the only way that a person can retain a certain high level of mobility and quality of life (March, et al., 2011).

Joint replacement surgery, specifically hip and knee, is costing the U.S. population a great deal, for both health insurance companies and for individuals. With the U.S. performing such a large number of hip and knee replacement surgeries, the costs for these procedures should be lower than that of other countries. However, actually joint replacement in the U.S. is much more costly as shown in Table 2. Expenses for these procedures average 1/3 the cost of foreign providers.

Knee replacement surgeries, in 2006, were performed in India for $8,500 and hip replacement surgeries are approximately $9,000, while the U.S. domestic retail price of the same procedures was $69,991 (Table 2). In Thailand and Singapore, knee replacements were $10,000 and $13,000, respectively. These international prices include hospitalization and airfare as well as a financial money allotment for a family stay in a hotel. The insurer coverage price of $30,358 for a knee replacement is about half the cost or less to obtain similar services outside the U.S.

This large gap in price is making the use of foreign medical choice viable for joint replacement surgeries. Indicure is a third example of a company that offers complete trips to other countries for the purpose of receiving a medical procedure (Indicure, 2011). Indicure and other similar companies offer such procedures as well as travel and follow-up costs as part of their surgery packages.

DISCUSSION

There is a movement in American medicine going from inpatient to outpatient treatment over the past several decades for certain surgeries. In 2006, nearly 35 million U.S. citizens had out-patient surgeries; triple the number of patients in 1996 (Keckley, 2009). Though this is not just an American trend, out-patient surgeries comprise a large bulk of medical tourism procedures caused by the long wait times associated with many non-invasive and/or elective operations. While not as predominate as in the U.S., many counties such as Canada, the U.K, Germany and Australia have created a normalcy of foreign medical operations (Hansen, 2008).

While this review mainly discusses in-patient procedures, it is vital to determine the importance of the movement from in-patient to out-patient treatment. Technology is one of the driving forces behind medical mobility and medical tourism. The averages for uninsured hospitalizations have increased by 34% from 1997 to 2006 (Merrill, et. al., 2009). For both insured and uninsured patients, hospitals stays are becoming shorter as technology helps to trend major surgeries to becoming less invasive, consequently reducing patient recovery times, lengths of stay, and

decreasing expenses for the patient, physician and facility. In California in 2009, the most expensive median charge per stay for a cardiac operation was over $417,000 at Centennial Hospital Medical Center in Inglewood with an average stay of seven days. The cheapest median charge for the same procedure was at Antelope Valley Hospital in Lancaster at under $80,000 with an average stay of 5.5 days (Office of California Statewide Health Planning and Development, 2011).

As another example, consider Mr. Jones, who is in need of a double Coronary Artery Bypass Graft, or CABG x 2 (double bypass open heart surgery). Mr. Jones is underinsured having minimal health insurance coverage that will pay only $10,000 towards this procedure. This will leave the patient with a large medical bill that could be as high as $20,000 or more based on the same fee schedule that Medicare paid in 2002 (Barry, & Hallam, 2005). This could put massive financial strain on Mr. Jones, or it could be financially impossible for him to pay for this procedure even with his insurance. However, if the patient were to use this $10,000, which his insurance is going to pay, towards the operation in a foreign country, then this surgical procedure could leave him with minimal, if any, out-of-pocket expenses. Mr. Jones, by taking advantage of medical choice abroad, can receive a CABG x 2 outside the U.S., and can return to the workforce in the U.S. as a productive member of society quickly. Using an alternative medical venue choice for Mr. Jones would not only help him, but it would also help his insurance company by offering extended coverage to more people at lower rates for heart surgeries by patients seeking medical treatment abroad. If more insurance companies in the U.S. can promote provisions including medical tourism, it could result in millions of Americans receiving foreign quality treatment for CVD and other ailments.

The example of Mr. Jones could also be used when considering joint replacement and kidney transplantations (including ESRD treatment) all based on fee structures as shown in Tables 1 & 2. In the United States, CMS could cover a bulk of these fees. However, it is still more cost effective to consider medical options abroad. CMS could save money on the cost of these procedures for beneficiaries by supporting and funding programs through alternative foreign medical options. In the United States, as in Canada and other countries institutionalizing medical travel companies, the Medical Tourism Association, based in West Palm Beach, Florida, has undertaken the task of educating patients around the world about the economic benefits of international medical location alternatives (MTA, 2010).

Even though there are substantial economic benefits to the practice of medical tourism, there are some potential downfalls. One of the most important issues today is the spread of MRSA and other staff disease-related operational complications concerning procedures performed outside a patient's home country. For example, commonly referred to as the Indian superbug, foreign medical procedures have been documented in cases around the world directly linking surgery procedures and a virus obtained in India. Follow-up and medication renewals, or lack of standard monitoring systems, are also causes for concern that additional expenses sometimes occur and have the potential to negate effective treatment (Srivastava, 2011).

Specifically in the U.S., nearly one of every four Americans is being denied a healthcare request because of economic hardship (National Association of Insurance Commissioners, 2008). As a solution, several states in the U.S. including California, Florida, South Carolina, and Wisconsin are considering or have partnered with insurance programs to aid their citizens with more affordable healthcare by utilizing international medical travel and treatment. For the past several years, the U.S. and many other industrialized counties around the world have weathered an economic recession, although the costs of healthcare have stayed parallel or continued to rise despite the economic downturn.

When considering such a significant difference in prices between the US and India, it is no wonder why U.S. citizens have begun using medical tourism to seek treatment for CVD that is offered in India. If there are patients that are in need of cardiac surgery and do not possess health insurance that will pay for this procedure, they are underinsured. In cases of uninsured individuals, using medical foreign travel becomes an economically smart option that is increasingly feasible with today's globalized economy.

Limitations

This research could be expanded to include operational procedures beyond those of only heart failures, kidney transplantation, and hip and knee replacements. Expanding the list of non-essential and cosmetic operations should reveal the same conclusions as those reached in this study. Another limitation of this research is that the quality of outcomes has largely been left unexamined. It is generally assumed, often incorrectly, that American physicians provide the best care and the most favorable surgical outcomes. This quality gap is becoming less and less prevalent, as Board Certifications have improved assessment outcomes and accreditation demands and activities. Cost and quality are not always directly related. Additionally, the timing of procedures has also become a critical factor along with cost and quality parameters.

CONCLUSION

Economically, alternative foreign medical shopping has become a valid option to consider when determining healthcare cost, especially in cases of inpatient surgeries and procedures. Medical choice has the opportunity to assist in curtailing the rising cost of healthcare in the U.S. Although, this is not a widespread option for those who are insured, it is nonetheless a growing trend in U.S. healthcare.

REFERENCES

Aarex India. *(2006). Kidney transplants*, Retrieved March 3, 2011 from: http://www.aarexindia.com/kidney.asp

Alemayehu, B. & Warner, K. (2004). The lifetime distribution of health care costs. *Health Services Research*, June 39(3): 627-642, Retrieved February 8, 2011 from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361028/

American Academy of Orthopedic Surgeons [AAOS] (2007). *Preparing for joint replacement Surgery*. Retrieved June 14, 2011 from: http://orthoinfo.aaos.org/topic.cfm?topic=a00220

American Academy of Orthopedic Surgeons [AAOS] (2009). *Total hip replacement.* Retrieved June 14, 2001 from: http://orthoinfo.aaos.org/topic.cfm?topic=a00377

American Heart Association (2011). *Cardio vascular disease statistics.* Retrieved March 31, 2011: from:http://www.americanheart.org/presenter.jhtml?identifier=4478

Barry, T, & Hallam, K. (2005). *Heart surgery costs 83% more in U.S. than in Canada, Study says.* Retrieved March 31, 2011 from: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a4J.ER8r4CrM&refer=ca nada

Black, T. (*March. 26, 2008).* Mexico gets tourists as health net sends U.S. patients. *Bloomberg*, Retrieved June 14, 2011 from: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aFXAEi5eek5I&refer=asia

Bumrungrad International Hospital, (2011). *Frequently asked questions*. Retrieved March 31, 2011 from: http://www.bumrungrad.com/overseas-medical-care/faq-s.aspx

Cardoen, B., Demeulemeester, E., & Beli¨en, J. (2008). Operating room planning and scheduling: A literature review. FED Research Report KBI 0807. Katholike Universiteit Leuven, Retrieved March 31, 2011 from: http://www4.ncsu.edu/~saerdoga/SurgeryScheduling_Erdogan_Denton_2010.pdf

Colorado General Assembly 07-1143 (2007). Legislation to consider: Geographic location for rating insurance. Retrieved March 31, 2011 from: http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1232524018870&ssbinary=true

Dheeraj Bojwani Consultants (2011). *Dr. Dheeraj Bojwani, India*, Retrieved March 31, 2011 from: http://www.dheerajbojwani.com/medical-treatment-india.html

Eggerston, L (2006). Wait-list weary Canadians seek treatment abroad. *Canadian Medical Association Journal*, 174:1247. Retrieved March 31, 2011 from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1435972/

Friedlaender, M. (2002). The right to sell or buy a kidney: Are we failing our patients? *Lancet. 359(9310): 971-97.* Retrieved March 3, 2011 from: https://www.firmaweb.ch/docs/9e7a962d26b14161630973624c692dbd/dl1.pdf

Hansen, F (2008). A revolution in healthcare – Medicine meets the marketplace. *Institute of Public Affairs. 59(4): 43-45.* Retrieved March 31, 2011 from: http://www.ipa.org.au/library/59-4_HANSEN.pdf

Herrick, D (2007). Medical tourism: Global competition in health care. *National Center for Policy Analysis*, Report No. 304, November. 2007. Retrieved March 31, 2011 from: www.ncpa.org/pub/st/st304

Horowitz, M., Rosensweig, J. & Jones, C. (2007) Medical tourism: Globalization of the healthcare marketplace. *Medscape General Medicine. 9(4): 33*, Retrieved March 3, 2011 from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2234298/

Indicure (2011). *Joint replacement surgery*. Retrieved June 14, 2011 from: http://indicure.com/treatments/joint-replacement-surgery.htm

Joint Commission International (JCI) (2011). *JCI Accredited Organizations* .Retrieved March 3, 2011 from: http://www.jointcommissioninternational.org/jci-accredited-organizations/

Johnston, R., Crooks, V., Adams, K., Snyder, J., & Kingsbury, P. (2011). An industry perspective on Canadian patients' involvement in medical tourism: Implications for public health. *BioMed Central Public Health*, 11:416, Retrieved June 15, 2011 from: http://www.biomedcentral.com/1471-2458/11/416

Kher, U. (2006). "Outsourcing your heart." *Time*, May 21, 2006. Retrieved

March 31, 2011 from: http://www.time.com/time/magazine/article/0,9171,1196429-5,00.html
Keckley, P. (2009). Medical tourism: Update and implications. *Deloitte Center for Health Solutions.* Retrieved March 3, 2011 from: http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_chs_MedicalTourism_111209_web.pdf
March L., Cross M., Lapsley H., Brnabic A., Tribe K., Bachmeier C., Courtenay B., & Brooks P., (1999). Outcomes after hip or knee replacement surgery for osteoarthritis. *Medical Journal or Australia,* 171(235-238), Retrieved June 14, 2011 from: https://www.mja.com.au/public/issues/171_5_060999/march/march.html
Medical Tourism Association [MTA] (2010). *About the MTA.* Retrieved June 14, 2011 from: http://www.medicaltourismassociation.com/en/about-the-MTA.html
Merrill, C., Stocks, C. & Stranges, E., (February, 2009). Trends in uninsured hospital stays, 1997-2006. Healthcare cost and utilization project, *Agency for Healthcare Research and Quality, Statistical Brief # 67.* Retrieved April 23, 2011 from: http://www.hcup-us.ahrq.gov/reports/statbriefs/sb67.pdf
Milstein A, & Smith, M.(2006). America's new refugees: Seeking affordable surgery offshore. *New England Journal of Medicine 355(16): 1637-1640.* Retrieved March 3, 2011 from: http://www.nejm.org/doi/full/10.1056/NEJMp068190
Milstein, A. & Smith, M. (2007). Will the surgical world become flat? *Health Affairs, 26,*(1): 137-141. Retrieved March 31, 2011 from: http://content.healthaffairs.org/content/26/1/137.full
Moeller, S., Gioberge, S., & Brown, G. (2002). ERSD patients in 2001: Global overview of patients, treatment modalities and development trends. *Oxford Journals,* 17(12) 2071-2076. Retrieved March 31, 2011 from: http://ndt.oxfordjournals.org/content/17/12/2071
National Association of Insurance Commissioners (August 12, 2008). *Weakening U.S. economy takes toll on American health*. Retrieved April 19, 2011 from: http://www.naic.org/Releases/2008_docs/economy_health_toll.htm
National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) (2010). *Kidney and urologic diseases statistics for the United States 10 (3895)*. Retrieved March 31, 2011from: http://kidney.niddk.nih.gov/kudiseases/pubs/kustats/
National Organ Procurement and Transplantation Network (2009). *Number of U.S. transplants per year,1988–2008.* Retrieved March 3, 2011 from: http://www.infoplease.com/science/health/us-transplants-year-1988-2007.html
Office of Statewide Health Planning and Development (2011). Common surgeries and charges comparison (CABG, 2009). *CA.GOV,* Retrieved on April 23, 2011 from: http://www.oshpd.ca.gov/commonsurgery/Default.aspx
Pearson Education (2007). *Medical advances timeline, infoplease: Family education network.* Retrieved June 14, 2011 from: http://www.infoplease.com/ipa/A0932661.html
Sachdeva, S., & Sachdeva, R. (July, 2010). Keeping an eye on the future: Medical tourism. *Indian Journal of Community Medicine. 35(3): 376-378,* Retrieved March 3, 2011 from: http://www.ijcm.org.in/article.asp?issn=0970-0218;year=2010;volume=35;issue=3;spage=376;epage=378;aulast=Jose
Sack, K. (2009). "U.S. cost-saving policy forces new kidney transplant." *New York Times*, September 13, 2009. Retrieved June 14, 2001 from: http://www.nytimes.com/2009/09/14/health/policy/14kidney.html
Sakhuja, V. & Sud, K. (2003). End-stage renal disease in India and Pakistan: Burden of disease and management issues. *Kidney International* 63, S115-S118. Retrieved June 14, 2011: http://www.nature.com/ki/journal/v63/n83s/full/4493749a.html
Sheehy, E., Conrad, S., Brigham, E., Luskin, R., & Weber, P. (2003). Estimating the number of potential organ donors in the United States. *New England Journal of Medicine, 349(7): 667-74.* Retrieved March 31, 2011 from: http://www.nejm.org/doi/pdf/10.1056/NEJMsa021271
Srivastava, R., Ichhpujani, R., Khare, S., Arvind R., & Chauhan, L. (2011). Superbug. *Indian Journal of Medical Research 133(4)458-460.* Retrieved June 14, 2011 from http://www.ijmr.org.in/article.asp?issn=0971-5916;year=2011;volume=133;issue=5;spage=458;epage=460;aulast=Srivastava
Tours2india4health.com (2011). *Medi tours and health tourism services, India*. Retrieved from:

http://www.tour2india4health.com/fissure-treatment-Nigerian-Chennai-India.html
Turner, L. (October, 2007) Medical tourism, Family medicine and international health-related travel. *Canadian Family Physician Vol. 53(10): 1639-1641*. Retrieved March 3, 2011 from: http://www.cfp.ca/cgi/content/full/53/10/1639
United Network for Organ Sharing (UNOS) (2011). TransplantLiving.org. Retrieved June 14, 2011 from: http://www.transplantliving.org/beforethetransplant/finance/costs.aspx
Wachter, R (2006). International teleradiology. *New England Journal of Medicine, February 2006: 354(7): 662-663.* Retrieved March 31, 2011 from: http://www.nejm.org/doi/pdf/10.1056/NEJMp058286
U.S. Department of Health and Human Resources (2010). *What is heart surgery?* Retrieved March 31, 2011 from: http://www.nhlbi.nih.gov/health/health-topics/topics/hs/
Woodman, J (2009). Patients beyond boarders: Everybody's guide to affordable, World class medical travel. Chapel Hill, N.C.: Healthy Travel Media.
West Virginia House Bill 2841(2007). *Authorization for treatment in foreign health care facilities accredited by the Joint Commission International (JCI): Incentives for covered employees; Rebate of savings.* Retrieved March 3, 2011 from: http://www.legis.state.wv.us/Bill_Text_HTML/2007_SESSIONS/RS/BILLS/hb2841%20intr.htm

Appendix A.

Table 1: Estimated U.S. Average 2008 First-Year Billed Charges per Transplant

Transplant	30 Days Pre-transplant	Procurement	Hospital Transplant Admission	Physician During Transplant	180 Days Post Transplant Admission	Immuno-suppressants	Total
Kidney Only	$16,700	$67,500	$92,700	$17,500	$47,000	$17,200	$259,000

Source: United Network for Organ Sharing, 2011.

Table 2: The Cost of Medical Procedures in Selected Countries in 2006 (U.S. dollars)

Procedure	U.S. Retail Price*	U.S. Insurers' Price*	India**	Thailand**	Singapore**
Heart Bypass	$210,842	$94,277	$10,000	$12,000	$20,000
Heart-valve replacement (single)	$274,395	$112,969	$9,500	$10,500	$13,000
Hip Replacement	$75,399	$31,485	$9,000	$12,000	$12,000
Knee Replacement	$69,991	$30,358	$8,500	$10,000	$13,000

* Retail price and insurer cost represent the mid-point between low and high ranges
** U.S. rates include at least one day of hospitalization. International rates include airfare, hospital and hotel.

Source: Unmesh Kher, "Outsourcing your heart," *Time*, May 21, 2006.