HUMANITARIAN MISSIONS TO GUYANA, SOUTH AMERICA

The Story of the First Kidney Transplant in Guyana, South America
And Lessons for Developing Countries

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1. How it all started
2. Kidney transplants
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NETWORKS MAKING A DIFFERENCE: A flyer posted in New York City connects...

- Transplant professionals in the DoD.
- A Real Estate mogul in Queens.
- Transplant professionals in Drexel.
- Physicians and nurses in Guyana.
The story starts when Mr. George Subraj, a property developer, picks up a flyer soliciting funds for a young man dying of kidney failure in Guyana:

**LEEKLUMARIE Mangal, 41, is appealing to the business community and the general public to help her son get a kidney transplant in India and dialysis treatment here.**

*She said her son, Munesh Mangal, 18, was diagnosed with “end stage renal failure” in August last year, after he became ill.*

*His mother, a vendor of green vegetables, said she is willing to donate her kidney.*
SURPRISE VISIT TO THE MANGAL’S HOME

A MOTHER PLEADS FOR HELP TO SAVE HER SON’S LIFE
ABOUT GUYANA

- A Dutch colony in the 17\textsuperscript{th} century, a British possession by 1915, achieved independence in 1966.

- 80\% is covered by rain forests. over 70\% of the natural habitat remains pristine.

- Ranks poorly on basic health indicators. Life expectancy is 63.

- Water and sanitation sectors are poor service and quality.

- Food or waterborne, and water contact diseases degree of risk is high.

Guyana is slightly smaller than Idaho.
“If all renal failure patients in Guyana were to be treated with hemodialysis, the recurrent costs could reach 68% of the total Ministry of Health budget, a situation which would be unacceptable.”
• $200-500 per dialysis session.

• Annual per capita income is $1,219. compared to the US $43,562.

• Renal Transplantation
  $ 150,000 in the US
  $ 40,000 in India
## Costs of Corneal Transplant in Developing and Developed Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>USA</td>
<td>$16,500</td>
</tr>
<tr>
<td>Netherlands</td>
<td>$7,942 - 14,807</td>
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<tr>
<td>Canada</td>
<td>$3171</td>
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<tr>
<td>Singapore</td>
<td>$3,710 (1,000-5,800)</td>
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<tr>
<td>South Africa</td>
<td>R15000 (~$1300)</td>
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<tr>
<td>India</td>
<td>$2100 - $2300</td>
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<tr>
<td>Guyana</td>
<td>Subsidized by our sponsor</td>
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<tr>
<td>Spain</td>
<td>£3,780</td>
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PREPARATIONS BEGIN FOR THE KIDNEY TRANSPLANT

• Educating the local physicians.

• Training the local nurses and OR staff.

• Dealing with legal and licensing issues.

• Dealing with the Minister of Health.
SKYPE CLINICS
The Guyana project was initiated in 2008. It is funded by the “Subraj Foundation” of New York.

Walter Reed NMMC and Drexel University, travel to Guyana 3-4 times a year. Several faculty from WRNMMC have participated in the program.

The major public hospital in Georgetown, Guyana, has been approved by USUHS for medical student electives.

The Guyana project has several components:
  – Renal replacement program which includes kidney transplantation, dialysis access surgery and related procedures.
  – Corneal transplantation.
  – SEVAK project (www.sevakproject.org) modeled on the Indian experience.
  – Several publications including the cover of the Bulletin, American College of Surgeons, have resulted from this work.
OUR NURSES TEACHING PATIENTS
A SINGLE KIDNEY TRANSPLANT...

“Raises the standards of medical care all around”
Dr. Leslie Ramsammy, Minister of Health

“One high profile kidney transplant by US-based team eclipses 10 years of rural medical work Guyana by the Cubans”
Editor of Kaieteur News
• Surgeons develop visionary plan to bring corneal transplants to developing countries
• Corneal opacities are cited as the third most common cause of blindness and represent 7 percent to 25 percent of all causes of blindness worldwide.

• In a study of 12,899 participants in India, the most common causes leading to corneal blindness included pterygium (34.5 percent), ocular trauma (22.3 percent), and infectious keratitis (14.9 percent).
• Due to the high rates of eye donation, the U.S. has sufficient quantities to both meet domestic demands and provide tissue to international recipients.
The corneal transplant mission in 2014 began first with an educational visit, talks with host nation ministry of health and hospital leaders, and a city-wide lecture to the ophthalmologists on corneal transplantation.

Shared Eye Bank Association of America manuals for Procedures.

Patients were examined together with a host nation ophthalmologist to determine suitability for subsequent corneal transplantation, and a waiting list was created.

The conversation continued after the US team departed, as host nation surgeons obtained the necessary equipment for surgery.
The second mission: Six successful transplants of *gratis US corneas* were performed by the Guyanese surgeon, under supervision of Dr. Waller.

The third and fourth missions: utilized the public hospital in Georgetown, a new and competent host nation surgeon, and restored sight in nearly two dozen additional patients.

December 2015 the minister of health announced plans for organ donation legislation in Guyana.
The transplant team examines a pre-corneal transplant patient. L to R: Dr. Neeraj Jain (local Eye Surgeon), the first corneal transplant recipient, Drs. Jindal, Waller, Patel, Mr. Subraj (Philanthropist).
Dr Waller, (top Left) looks on as Dr Jain (local eye surgeon at microscope) and local nurse assistant (Left) place a cornea onto the patient’s eye. Drs Jindal and Patel observe.
Waller and local physician examine a patient before surgery.

L to R: Mr. Subraj (Philanthropist), Drs. Waller, Jindal, while Patel and local nurses are in the background.
We screened 450 patients with CKD of which 70 patients were suitable for a kidney transplant.

Of this cohort, there were 5 patients whose evaluation raised ethical dilemmas:
- One patient had non-adherence with dialysis
- Two patients of Guyanese origin living abroad wished to have the transplant performed in Guyana
- A minor who wished to donate to her mother
- Another patient was considering commercialization of transplant process

3 patients were rejected for consideration for transplant, despite having living donors.
- One was non-adherent
- Second was turned down due to the patient’s attempt to commercialize the transplant process
- Third was a minor who wished to donate to mother. The other 2 patients were considered Guyanese ex-patriots and were acceptable for the program.

PART 4
PREVENTION – SEVAK PROGRAM

Global Trends in Incidence of Diabetes Mellitus

<table>
<thead>
<tr>
<th>Year</th>
<th>India</th>
<th>China</th>
<th>U.S.A.</th>
<th>Russian Federation</th>
<th>Pakistan</th>
</tr>
</thead>
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<tr>
<td>1995</td>
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<td></td>
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<td>2030</td>
<td></td>
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Dr. Thakor Patel (Project Chairman) and Kirti Patel (Project Manager) meet with CM Modi to discuss the Sevak Project
• Sevak Project is based on the US Navy model of Independent Duty Corpsman.

• The average population of the village was about 1500-2500.

• Sevaks were identified with average education of 12th grade and above.

• The acronym SEVAK stands for “Sanitation and Health, Education in Village communities through improved Awareness and Knowledge of Prevention/Management of Diseases and Health Promotion”.

• WWW.SEVAKPROJECT.ORG
PURPOSE OF SEVAK PROJECT

• Sevak Project was created:
  – To screen villagers for diabetes, hypertension, obesity and other chronic disease.
  – To provide lifestyle modification, sanitation, water purification and healthy environment education to prevent diseases and other ailments that can take away the livelihood of the farmers and laborers.

• The sevaks are in their respective villages doing screening for diabetes and hypertension along with recording other health care problems.

• They are required to educate the village folks about the merit of having house toilets and smokeless stoves ventilated to the outside.

• Graduation after 10 weeks with competency tests in health education, glucometers, BP and training the trainer.
GUYANA – DISTRIBUTION OF SEVAKS

• 14 students and 2 teachers have been identified.

• They have been trained in basic sciences.

• They have learned the use of BP and glucometer and survey techniques.

• 14 villages with 1000 adults each have been identified for survey.
Testing skills of a SEVAK

Visiting a 7 yrs old with type 1 diabetes

Sanitation and health Education in Village communities through improved Awareness and Knowledge of prevention/management of diseases and health promotion.
ENVIRONMENTAL WORK OF SEVAKS

SEVAK HELPING IN CONSTRUCTION OF INDOOR TOILETS

SEVAKS HELP PROCURING SMOKELESS STOVES
Characteristics of population of Guyana

- Diabetes: 13.9%
- Hypertension: 29.4%
- Overweight: 43.6%
- Obesity: 12.4%
- Smoking: 12.1%
- Tobacco use: 9.9%
- Alcohol use: 37%
- Smoking hazard knowledge: 71.4%
- Mouth cancer awareness: 57.1%
- Pap smear: 10.3%
- Breast exam knowledge: 5.7%

Percent
CHRONIC DISEASES - DIABETES

<35 Years: Pre-diabetes- (2%); Diabetes- (1.1%)
≥ 35 Years: Pre-diabetes-(8.5%); Diabetes-(5.6%)
CHRONIC DISEASES - HYPERTENSION

- Normal: 90-119/60-79 mm Hg
- Pre-hypertension: 120-139/80-89 mmHg
- Hypertension: >140/>90 mm Hg

Total 27716
PART 5 - ADVOCACY AND PRESS

Dr. Thakor Patel (Project Chairman) and Kirit Patel (Project Manager) meet with CM Modi to discuss the Sevak Project.
Press conference after a successful kidney transplant

Minister of Health inaugurating corneal transplant CME
• 3 kidney transplants have been performed by local surgeons.

• 6 corneal transplants by local surgeons (American corneas).

• Vascular access and peritoneal dialysis now performed routinely.

• A local urologist, anesthesiologist, internist, and operating room nurse are now well trained to manage dialysis and transplant patients, so the visiting team is much smaller (14 members initially to 4 recently).

• Over the next few years our role will mainly be support via tele-medicine.

• Creating a capacity solely within the host nation is the ultimate goal of the program.
Increase in dialysis chairs from 3 to 26.

Installation of MRI machine for kidney donor work up.

Up-grade of Biochemistry, next is local tissue typing.

Entire eye clinic up-graded.

New operating microscope for teaching cornea transplantation.

Registry for CKD/dialysis.
We placed 21 patients (15 [ESRD], 2 with acute kidney failure) on PD from July 2010 to present.

Of the 17 patients, 4 patients received living kidney transplants.

PD is a safe and cost effective option in Guyana and may be suitable for similar developing countries. In Guyana, PD was used as a bridge to a living kidney transplant.

Peritoneal Dialysis International 2013; 33:116
• The kidney and corneal transplant programs have served as an exemplar for the 15 countries of the CARICOM.

• The eye bank to be initiated in Guyana will serve the entire Caribbean basin.

• Dr. Jindal addressed a special meeting of the 15 ambassadors of the CARICOM in 2015 and again in 2016 to solidify these principles.

• Kidney and corneal transplant team slated to go to BD in December 2 – 8, 2016.
• The paper was entitled: “The Seven Sins of Humanitarian Medicine”, and was published in the *World Journal of Surgery* [Welling, Ryan, Burris, Rich: January 2010, Volume 34 (3), 466-470.]

• In the paper, authors addressed some of the traps that can lead us astray, as we try our best to delivery humanitarian aide to countries less fortunate than ours.
AND WHAT ARE THE SEVEN SINS?

Leaving a mess behind.

Failing to match technology to local needs and abilities.

Failing of NGOs to cooperate and help each other, and to cooperate with and accept help from military organizations.

Failing to have a follow-up plan.

Allowing politics, training, or other distracting goals to trump service, while representing the mission as “service”.

Going where we are not wanted, or needed and/or being poor guests.

Doing the right thing for the wrong reason.
WAS THE GUYANA MISSION PROPERLY DESIGNED AND EXECUTED?

• I believe it was!
• We did not leave a mess behind!
• We did not have a mismatch between our technology and the country of Guyana.
• We had an excellent, on-going follow-up plan, with return trips planned quarterly, Skype calls, etc. etc.
• We rendered pure service, with no ulterior motives.
• We were invited to Guyana, and were good guests.
• We did the right thing for the right reason!
23rd MISSION COMPLETED

• 26th kidney transplants performed.
  – Numerous related procedures
  – Over 1000 patients with varying stages of CKD
  – Primer with generic medications.
  – SKYPE clinics.

• 34 corneal transplants performed.
  – Related eye procedures

• SEVAK project extended to more areas of Guyana.
  – Over 1000 people screened
SUMMARY

• We have training local physicians and nurses so that our team is smaller (14 members to 4).

• We have raised the standard of care and infrastructure in the health sector of Guyana.

• Manuscripts have been published to document our work for other developing countries.
• Our work was made possible because of an intricate partnership between the private and public sectors.

• The Guyanese government plays a significant role in facilitating physician licenses and liability coverage, and importing generic medications, free of charge to the patients.

• Local medical staff identifies patients and provides pre- and postoperative care under the supervision of Dr. Waller in case of corneal transplants and Dr. Jindal in case of kidney transplants.
US MULTI-CULTURAL TEAM AT WORK

Dr Steve Waller with local surgeon

Kidney transplant team in front hospital
SPECIAL THANKS TO

Walter Reed NMMC
- COL Ed Falta
- CAPT Eric Elster
- CAPT TG Patel
- David Oliver, RN
- COL David Welling
- COL Stephen Waller
- CAPT Joe Pasternack

Drexel University
- Dr Steve Guy
- Dr Alden Doyle

Reserves
- COL Art Womble

Non-Medical Staff
- Nurses, OR staff, Tissue typing

International Coordinator
- Ms. Luz Rodriguez