

PROJECT PROPOSAL FOR
GLOBAL GRANTS

**Blindness Prevention and
Community Diabetes Care**
[including Tele-Ophthalmology]

Index

1. Project Summary
2. Project Details
3. Rotary's Area of focus covered
4. Need
5. Impact
6. Project Duration, Cost and Funding
7. Project Sustainability
8. Project Working
9. Partner Organisation

Project Summary

Diabetic eye disease remains a major cause of blindness in the world. Laser treatment for [proliferative diabetic retinopathy and diabetic macular edema](#) became available more than two decades ago. The outcome of treatment depends on the timing of laser treatment. Laser treatment is optimally delivered when high-risk characteristics have developed in proliferative retinopathy or diabetic macular edema and before this has significantly affected vision. Laser treatment is usually successful if applied during this optimal period whereas the treatment benefit falls sharply if the treatment is applied too late. In order to optimize the timing of laser treatment in diabetic eye disease screening programs have been established.

[The incidence and prevalence of blindness is much lower in populations where screening for diabetic eye disease has been established compared to diabetic populations without screening. Technical advantages may allow increased efficiency and tele screening.](#)

[From a public health standpoint screening for diabetic eye disease is one of the most cost effective health procedures available. Diabetic eye disease can be prevented using existing technology and the cost involved is many times less than the cost of diabetic blindness.](#)

Project Details

Name of Project	Blindness Prevention And Community Diabetes Care [Including Tele Ophthalmology]
Project Objective	To diagnose and treat diabetic retinopathy and blindness in rural and urban Bangalore District in specific and others in various geographies in general.
Rotary's Area of Focus covered	Disease Prevention and Treatment
Name of Rotary Club R.I. District	Rotary E-Club of Bangalore 3190
Name of Matching Rotary Club R.I. District	To be finalised To be finalised
Partner Organisation (Implementaion partner)	Samatvam [Science And Research For Human Welfare Trust]
Project Site	Jnanasanjeevini Medical Center 2, 1 A Cross Marenahalli, JP Nagar Phase 2, Bangalore 560078, India
Duration of Project	5 months and ongoing thereon
Project Outlay	US\$ 50,100
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Rotary Area of Focus Covered

The project significantly covers one of Rotary's Areas of Focus: **DISEASE PREVENTION AND TREATMENT**. On effective implementation of the project, the project would:

1. IMPROVE THE CAPACITY OF THE LOCAL HEALTHCARE PROFESSIONALS through access to very important diagnostic equipment and also equipment to treat the disease
2. ENHANCE THE HEALTH INFRASTRUCTURE IN THE LOCAL COMMUNITY

Need Assessment

Diabetic retinopathy is recognized as one of the ocular diseases with public health implications in India due to several reasons, including:

1. An estimated 57 million people in India may be diabetic by 2025 (195% increase from 1995) and
2. The risk of sight-threatening retinopathies is higher in diabetic adults.

Diabetic retinopathy causes blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. After 15 years of diabetes, approximately 2% of people become blind, and about 10% develop severe visual impairment.

India is home to over 61 million diabetic patients - an increase from 50.8 million last year. By 2030, India's diabetes burden is expected to cross the 100 million mark as against 87 million earlier estimated. (The Times of India, Dec. 14, 2011)

The estimated increase in the magnitude of diabetes in India and the potential for a consequent higher prevalence of diabetic retinopathy suggest an immediate need to establish control measures so that diabetic retinopathy does not become a major cause for vision impairment and blindness.

Targeting high-risk groups such as known diabetic individuals for community screening may help to increase yield of diabetic retinopathy cases without compromising sustainability of the program.

There is no national screening program for diabetic retinopathy in India at the moment, largely because screening is enormously difficult to plan, manage and monitor.

The number of eye care professionals in India with the necessary skills to diagnose and treat diabetic retinopathy is currently inadequate, and there are not enough lasers. However, health care professionals, including ophthalmologists, are well aware of the emerging epidemic.

At the moment in India detection of diabetics with retinopathy needing treatment is being undertaken in several different ways:

1. Eye camps specifically for diabetes
2. Opportunistic detection, i.e. examination of the retina of all diabetics when they present to eye care facilities for whatever reason
3. Telemedicine – where the retina is photographed digitally and the images are then read remotely by experts

Project Impact

Through this project, estimates based on the diabetes patient footfalls at the partner organization, the following may be taken as the impact of the project.

ESTIMATES: (APPROXIMATE, PER YEAR)

Number of diabetes patients to be screened for diabetes retinopathy in one year	10,000
Number of diabetes patients who will benefit from retinopathy prevention programs	8,000
Number of diabetes patients with diabetes retinopathy diagnosed	2,000
Number of diabetes patients with vision threatening diabetes diagnosed	1,000
Number of patients with advanced diabetes retinopathy benefitted by preservation of vision	500 - 900

Project Sustainability

The partner organization has undertaken to take up the responsibility of maintenance and operations of the equipment including purchase of consumables, manpower, servicing, etc. through their internal financial resources.

JNANA SANJEEVINI is a dedicated community health care project of SAMATVAM Trust [a registered non-profit tax exempt organization, recognized by Government of India], initiated in 2003 in Bangalore. Its aim is to provide multidisciplinary care for diabetes and related health problems 'all under one roof'. The Rotary Diabetes Diagnostics Center, established by a Rotary Matching Grant in 2006, is an integral part of Jnana Sanjeevini, and has served more than 25,000 people with diabetes since its inception, especially, the poor and needy [at the bottom of the socioeconomic pyramid].

Jnana Sanjeevini has been collaborating with Vittala International Institute of Ophthalmology [another pioneering charitable trust], Bangalore, over the last 2 decades. This medical and scientific collaboration is vital to the continued success of delivering preventive and therapeutic eye care for the citizens of Bangalore and Karnataka State, India.

Project Duration

Upon receiving of the funds, the project can be commissioned for operations within 5 months after setting up of equipment, trial-run, etc.

After the commissioning, the project would run continuously as part of the diabetes care program of the project partner.

Project Cost

The project cost would be mainly due to the equipment procurement since the facility and other necessary infrastructure are in place. The project cost therefore would be as follows:

Fundus Camera (Canon CR2)	US\$ 27,685 (incl. taxes and installation)
Laser photo-coagulator	US\$ 25,585 (incl. taxes and installation)
Incidentals	US\$ 200
TOTAL	US\$ 53,470

Project Funding pattern

Host Club	US\$ 2000
Host District DDF	To be determined
International Partner Club	To be determined
International Partner District (DDF)	To be determined
TRF	To be determined
TOTAL	US\$ 53470

Partner Organization

SAMATVAM (equanimity) is a registered non-profit charitable public trust, initiated by a group of medical volunteers in 1990. SAMATVAM was established to provide comprehensive health care for people with diabetes and other endocrine metabolic disorders, with care and compassion (Service with Devotion). Since its inception, a major focus of SAMATVAM'S public service activities has been providing treatment to the poor and needy from different parts of Karnataka State, neighboring states, and other parts of India.

JNANA SANJEEVINI (knowledge for health and life) is a dedicated community health care project of SAMATVAM Trust, initiated in 2003, at its new building in JP Nagar, Bangalore. Its aim is to provide multidisciplinary care for diabetes and related health problems 'all under one roof'.

SAMATVAM/JNANA SANJEEVINI public service programs: DISHA, DOSTI AND DEEPA are the three major pivotal public service programs of SAMATVAM AND JNANA SANJEEVINI.

1. Program DISHA (Diabetes Interaction Support Health and Achievement):
Beneficiaries: Type I diabetes Insulin dependent diabetes children and youth;
2. Program DOSTI (Diabetes Organization Support Training and Interaction):
Beneficiaries: Type II diabetes Non-insulin dependent diabetes adults;
3. Program DEEPA (Diabetes Educators Education Practice and Accomplishment):
Beneficiaries: Diabetes health counselors / educators / health workers.

PATRONS AND TRUSTEES:

1. Sri Hon MN Venkatachaliah, Former Chief Justice, Supreme Court of India, Chairman, Human Rights Commission
2. Sri A Ramaswamy, IAS, Ex Principal Secretary, Government of Karnataka
3. Dr SS Srikanta, MD (AIIMS), [PhD], FEDM, FACE
4. Ms NS Vijayalakshmi, BSc
5. Ms Padmaja Srinivas, MA, LLB.

Program DISHA

- Diabetes Interaction Support Health and Achievement
- Beneficiaries: Type I diabetes Insulin dependent children and youth
- Patient – Parent support groups
- FREE Childhood Diabetes Clinic, first Sunday of every month
- 'Insulin for every child' project - State of Karnataka
- Health education and counselling
- Social support – "Adopt a child"
- Residential health – recreation camps

Program DOSTI

- Diabetes Organization Support Training and Interaction
- Beneficiaries: Type II diabetes Non-insulin dependent diabetes adults
- Health awareness, screening and treatment camps – Bangalore urban and rural, State of Karnataka
- Free / subsidized Diabetes Clinic, medicines, tests and treatment
- Diabetes Self Care Basic and Intensive – patient and family health education programs
- Every 2nd, 3rd and 4th Saturday, and special dates / weeks; Health education and counseling
- Diabetes initial assessment, continuing care and Diabetes Annual Health Review; periodic and systematic medical screening and follow – up, proper and prompt multidimensional treatment for blood glucose, blood pressure, blood cholesterol control, and healthy life style (smoking prevention, ideal body weight, physical activity, stress management etc)
- Social support
- Telemedicine!!! Virtual Diabetes Camps, outreach follow-up clinics

Program DEEPA

- Diabetes Educators Education Practice and Accreditation
- Beneficiaries: Diabetes health counselors / educators
- Theory classes: Basics of anatomy, physiology, biochemistry, pathology, microbiology, behavioral science, clinical medicine (various medical, surgical and allied disciplines)
- Practical skills training: History, physical examinations, investigations, psychology and counseling skills, problem oriented medical record, electronic medical record, hospital care, rehabilitation, information technology – computer skills
- Internship: Supervised practical clinical experience working in the Diabetes Day care Center, referral departments, in-patient hospital setting Individual and group counseling, psychosocial support, development of health education materials, 24 hour diabetes helpline
- Conferences, seminars, workshops and discussion groups; tele-education, internet based multimedia resources

Project Explanation

What Vision Problems Can Be Caused By Diabetes?

Vision impairment is a frequent complication of diabetes, both Type 1 and Type 2.

The major cause of blindness in people with diabetes is diabetic retinopathy. Diabetic retinopathy is a term used for all the abnormalities of the small blood vessels of the retina caused by diabetes, such as weakening of blood vessel walls or leakage from blood vessels. Retinopathy progresses from non-proliferative or background retinopathy to proliferative retinopathy.

Non-proliferative retinopathy is a common, usually mild form that generally does not interfere with vision. Abnormalities are limited to the retina and usually will only interfere with vision if it involves the macula, the area on the retina that gives us the sharpest vision. If left untreated it can progress to proliferative retinopathy.

Proliferative retinopathy, the more serious form, occurs when new blood vessels branch out or proliferate in and around the retina. It can cause bleeding into the fluid-filled center of the eye or swelling of the retina, and lead to blindness.

Nearly all patients who have Type 1 diabetes for about 20 years will have evidence of diabetic retinopathy.

Up to 21% of people with Type 2 diabetes have retinopathy when they are first diagnosed with diabetes, and most will eventually develop some degree of retinopathy.

Diabetes is the leading cause of new cases of blindness in adults 20-74 years of age, worldwide. Each year, several lakhs of people lose their sight because of diabetes in India.

Glaucoma, cataracts, and corneal disease are more common in people with diabetes and contribute to the high rate of blindness.

Can Diabetes-Related Vision Problems Be Prevented?

The key to preventing diabetes-related eye problems is good control of blood glucose level, blood pressure level, a healthy diet and good eye care [Periodic screening and early detection of diabetic retinopathy (using Fundus Camera). Early aggressive treatment of diabetic retinopathy (using Laser photocoagulation and other therapies)]

The Diabetes Control and Complications Trial (DCCT), a 10-year study which ended in June 1993, proved that among Type 1 patients improved blood glucose control prevents or delays diabetic retinopathy. Therapy that keeps blood sugar levels as close to normal as possible reduced damage to the eyes by 76%. (New England Journal of Medicine, September 30, 1993)

Because a person with diabetes can have retinopathy and not know it, a regular checkup with an eye care professional is essential. Regular checkups with an eye doctor can detect retinopathy early and possibly prevent blindness.

What Should Diabetes Patients Do?

Patients with Type 1 diabetes should see their eye care professional annually for a dilated eye examination beginning within three to five years of the onset of diabetes. Women with Type 1 who are pregnant should have a comprehensive eye examination in the first trimester and close follow-up throughout pregnancy.

Patients with Type 2 diabetes should see their eye care professional for a dilated eye examination shortly after diagnosis of diabetes and annually thereafter.

One of the main motivations for screening for diabetic retinopathy is that there are effective treatments to prevent vision loss.

What Is Needed?

In ideal circumstances, patients with diabetes will have their disease under good control and be monitored frequently by a health care team knowledgeable in the care of diabetes.

Health care team education is vital. Because people with diabetes have a multi-system chronic disease, they are best monitored and managed by highly skilled health care professionals trained with the latest information on diabetes to help ensure early detection and appropriate treatment of the serious complications of the disease. A team approach to treating and monitoring this disease serves the best interests of the patient.

Patient education is critical. People with diabetes can reduce their risk for complications if they are educated about their disease, learn and practice the skills necessary to better control their blood glucose levels, and receive regular checkups from their health care team.

To reduce the cases of blindness due to diabetes, early detection is important. Patient education, health care team education, and affordable eye care can make this possible.

Global prevalence of diabetes mellitus and diabetic retinopathy

Diabetes mellitus currently affects more than 170 million persons worldwide and will affect an estimated 366 million by 2030, with the most rapid growth in low and middle-income countries, among populations of working age. More than 75% of patients who have had diabetes mellitus for more than 20 years will have some form of diabetic retinopathy. Diabetic retinopathy is a micro vascular complication of both Type 1 and Type 2 diabetes mellitus. The condition is a leading cause of new-onset blindness in many industrialized countries and is an increasingly more frequent cause of blindness elsewhere. WHO has estimated that diabetic retinopathy is responsible for 4.8% of the 37 million cases of blindness throughout the world.

Evidence-based treatment is available to reduce significantly the risks for blindness and for moderate vision loss. Clinical studies spanning more than 30 years have shown that appropriate treatment can reduce the risks by more than 90%.

Delivery of eye care for patients with diabetes

Despite clearly defined clinical guidelines for evaluating and treating diabetic retinopathy in a cost-effective manner, effective interventions, such as laser treatment, are underused, for a variety of reasons. While the available resources and methods differ from country to country, certain basic components of care should be present.

Patients should know that they have diabetes mellitus and that the condition requires care. General population screening for diabetes mellitus with existing methods is considered neither appropriate nor beneficial, although use of such methods to reach subpopulations with a very high prevalence of diabetes mellitus might be both appropriate and feasible for some Member States.

Patients should receive adequate care for diabetes mellitus.

The only means of preventing diabetic retinopathy is regulating blood sugar, blood pressure and other risk factors that can be controlled by patients, under the guidance of their care provider. Often, however, physicians do not care for diabetes patients in the manner indicated by the results of randomized controlled trials.

Patients should undergo periodic eye examinations.

Professional organizations advocate annual eye examinations for patients with diabetes and prompt treatment when indicated. Nevertheless, many patients with diabetes are not evaluated or treated adequately to prevent unnecessary blindness and visual loss.

Patients should receive adequate treatment for diabetic retinopathy.

The prevention of vision loss from diabetic retinopathy should be an integral part of the management of diabetes mellitus. Specific treatment for sight-threatening stages of retinopathy should follow established guidelines. Patients should be sufficiently aware and motivated to undergo not only an initial eye examination but also regular follow-up examinations. Understanding the difficulties and barriers to regular eye examinations is one step in addressing the prevention of blindness from diabetic retinopathy. It is not enough to provide information that patients can understand; a "marketing" approach should be used, to 'sell' to the patient the idea of the importance of regular eye examinations.

Telemedicine and Tele ophthalmology and Diabetes care:

Telemedicine is the integration of electronic information and medical technology by which people in remote and underserved areas can get access to specialized expert health care. Telemedicine is a rapidly developing field, with the application of clinical medicine by telephone, Internet, or other networks for the purpose of consultations and on occasion, carrying out examinations or medical procedures. This may be as simple as two health professionals discussing a case over the telephone, or as complex as using satellite technology and video-conferencing equipment to conduct a real-time consultation between medical specialists in two different countries. Telemedicine has special significance to India considering its vast geographical spread and predominant rural population where medical care is neither available nor accessible. While 72% of India's 1.2 billion people live in rural areas, over 70% of the doctors practice in urban areas. The application of telemedicine in the field of ophthalmology (teleophthalmology), can be used to provide ophthalmologic services to rural, underserved, and impoverished parts of India.

Benefits of teleophthalmology.

1. Diagnosis and formulation of treatment plans for diabetic retinopathy
2. Visual acuity testing and refraction
3. Low vision consultations
4. Cataract screening
5. Glaucoma screening
6. Anterior segment imaging
7. Continuing medical education by tele-education
8. Transferring of ultrasound, electrooculography and electro-retinography images
9. Employment facilities to the local unemployed youth
10. Can reach remote rural and underserved areas where specialized medical care is not available

Diagnosis and Treatment flow

The key to preventing diabetes-related eye problems is good control of blood glucose levels, blood pressure levels, a healthy diet and good eye care [Periodic screening and early detection of diabetic retinopathy (using Fundus Camera); early aggressive treatment of diabetic retinopathy (using Laser photocoagulation and other therapies)].

The components of the project include:

1. Patients should know that they have diabetes mellitus and that the condition requires care.
2. Patients should receive adequate care for diabetes mellitus.
3. Patients should undergo periodic eye examinations.
4. Patients should receive adequate treatment for diabetic retinopathy.
5. Telemedicine and tele-ophthalmology facilitates diabetes and eye care

Equipments needed:

1. Digital fundus camera
2. Laser photocoagulation equipment

