Nyaya Health

2008 Quarter 3 Update

To our supporters...

This quarter marks the 30th anniversary of the Alma Ata Declaration -- a compact signed by world leaders in 1978 to bring "health for all" by the year 2000. Alma Ata brought inspiration to many, even if its target was not achieved. But over the past three decades, the definition of "primary healthcare" has narrowed. Today, primary care in poor countries is often said to be a "minimum package" of health services, such as vaccines or simple treatments. Certainly, these basic ingredients are essential. But when someone involved in an accident goes to a primary care clinic operated under this philosophy, they are turned away, because care is defined so narrowly that laceration repair is no longer considered an essential health service.

We can do better. (Yes, we can.)

At Nyaya Health, the community of Achham in Far Western Nepal has been teaching us that narrow perspectives often undermine the quest of communities to attain truly enjoyable livelihoods free of disease and disability. We've been taught that reaching across disciplines as varied as architecture and epidemiology can help us to develop creative initiatives to integrate traditional public health measures, novel poverty-relief programs, and local capacity-building for long-term health.

We have been lucky to achieve so much success in preventing and treating disease in Achham. Our latest health indicators and medical outcomes show that we've become a strong resource for a population previously denied service. But our work requires that we continue to develop systems to maintain community accountability and challenge poverty.

This quarter, we have initiated a hospital-building project to address Achham's highest-priority needs, as determined by members of the community and as witnessed in our own clinic (http://wiki.nyayahealth.org/SurgicalServices). As always, we are working with the local government to ensure the long-term success of our operations; this includes the gradual integration of our training and service work into a new federal healthcare system, which is currently non-existent in the region. We hope you will join us in continuing our venture to expand a transparent, community-based, comprehensive model of healthcare delivery.

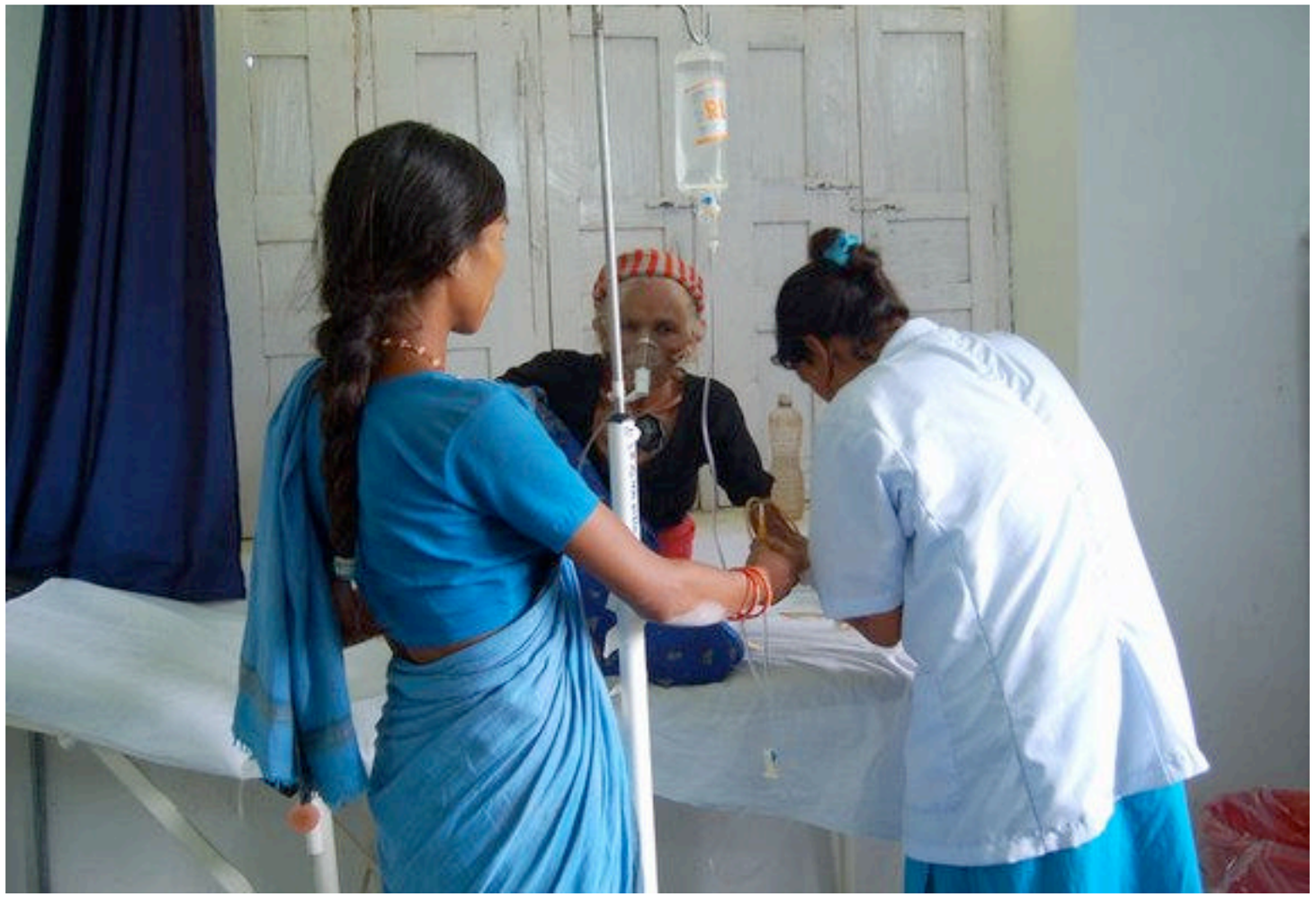
Sincerely,
The Nyaya Health Team

About us

- The heart of Nyaya Health activities in Achham is a large regional clinic focusing on local disease and disability.
- Our clinic is run by an all-Nepali staff consisting of physicians, community healthcare workers, nurse-midwives, lab technicians, and project managers who typically see over 100 patients per day.
- Our network of community health workers provide essential outreach and triage services to a geographically dispersed population. These services have been developed in collaboration with the government of Nepal; the ultimate goal is full integration with public-sector health programs.
- Over the next year, we are developing a community telemedicine and education center, piloting innovative management programs to improve community ownership, and renovating a hospital that was abandoned 25 years ago to expand our medical, obstetric, and surgical capacity.

Our principles

- We strive towards a single standard of care for all patients.
- Every preventable death is our shared responsibility.
- An accountable health system depends upon innovative management structures and collaboration with local government.
- In resource-poor settings, users fees often present an insurmountable barrier to health care access and serve to perpetuate inequalities in health.
- Equitable expansion of information and communication technologies can greatly facilitate the roll-out of effective, democratic, and geographically comprehensive health services.
- We use an inclusive team-approach consisting of community health workers, nurses, physicians, and midwives.
- Health promotion and education are critical, but significantly less effective without medical resources.
- We take donors' generosity very seriously, and will always avoid waste. All revenue goes towards medical and public health service, not foreign volunteers or overhead expenditures.
- Epidemiological surveillance and outcomes monitoring drives and refines our work.
- Integrated primary care systems fight epidemic disease more effectively than top-down approaches.



At Nyaya Health, we foster training and service in all aspects of medical care, from nurse-midwifery to laboratory services. We believe that comprehensive and reliable medical care does not take place from short-term trips or traveling doctors, but by having a locally-grounded team of skilled personnel to administrate a comprehensive health system ranging from reliable pharmaceutical supply to effective community-based follow-up.

As a result, our team consists of advanced laboratory personnel, 24-hour birth attendants, pharmacists, clinical oversight staff, and community healthcare workers. We have developed an extended team of providers, who now include 20% of the nurse-midwives in the entire region.

Case Study: Averting Maternal Mortality

October 20th. An 18 year-old female from the neighboring village of Mastamandu was carried by her family to our clinic. She was 40 weeks pregnant and was suffering from headaches and blurry vision. She was initially conversant and was following commands, but her blood pressure was severely elevated at 160/120. We diagnosed “pre-eclampsia”, a condition that can endanger the life of the mother and her baby. We immediately started treatment with the drug methyldopa. Despite therapy, she went into a generalized, tonic-clonic seizure. We then started magnesium sulfate, an emergency measure, and her seizure stopped within a minute.

Given the severity of her condition and the need for emergent Cesarean section, we discussed her options with the family and decided to transport her to a hospital in Dadeldhura, about seven hours away, that could perform the surgery. Transportation was acquired within a half-hour, and we provided her more magnesium sulfate to prevent seizures. At the hospital, the patient delivered a healthy baby. She and her baby returned to the clinic in excellent health one week after hospitalization.

Nyaya Health covered costs of her medical care, but recognized that this woman--like so many others in the region--narrowly avoided significant disability and possibly death. Her case highlighted the dire need for preventative and surgical services, including emergency obstetrical services, in this region.

To address the care of women like her, we’ve developed an extensive network of community healthcare workers to provide prenatal care, ultrasound services to detect high-risk pregnancies, and a plan with the local community and government to renovate an abandoned hospital. We plan to provide the necessary training and material support to operate a full inpatient, obstetrical, and surgical facility.

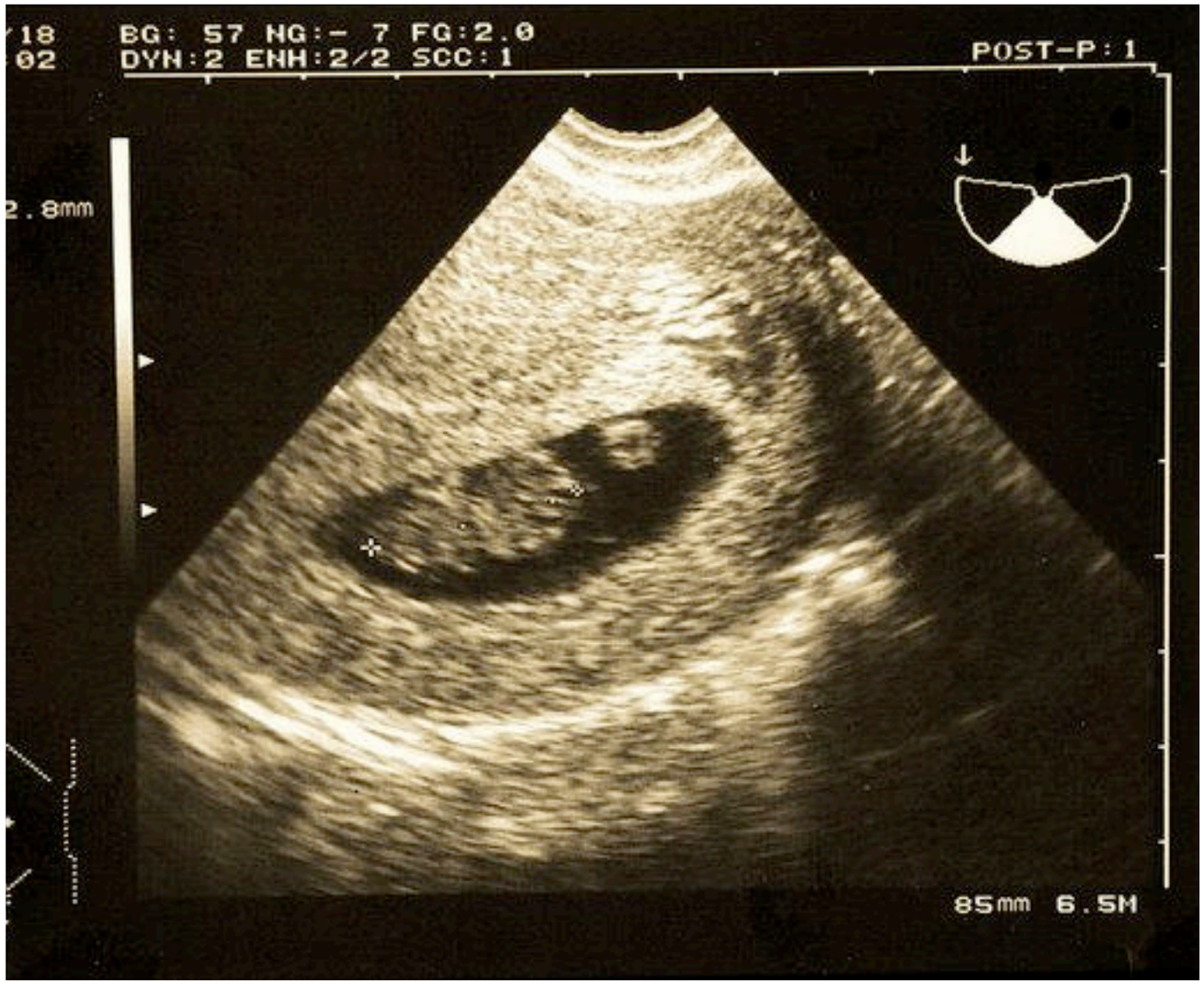
Maternal health services

July-November

- # of antenatal care visits: 464
- # of deliveries: 40
- # of vacuum-assisted deliveries: 2
- # of referrals for surgery: 5
- # of maternal deaths: 1
- # of live infant births: 40
- # of infant deaths: 2
- # receiving contraception: 37

Preventive medicine

Diagnostic imaging is largely unavailable in rural, poor communities. Nyaya Health introduced the first ultrasound to a region of over 1 million people.



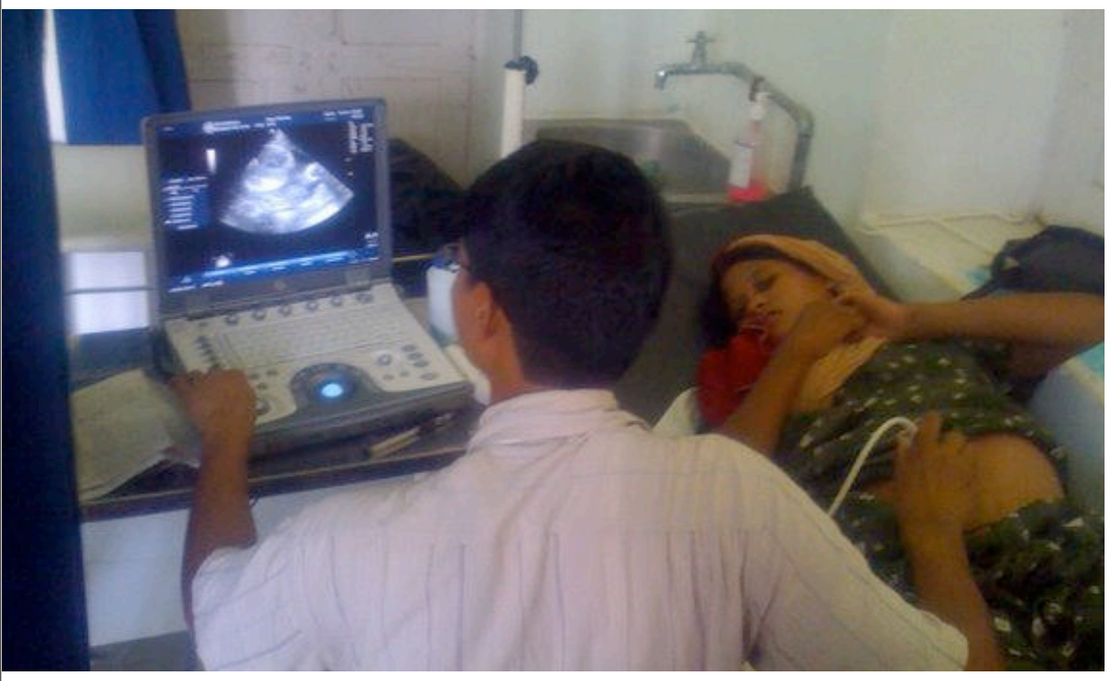
Ultrasound services

To meet the diagnostic needs of patients in Achham, Nyaya Health has started an ultrasound program using a GE LogicBook E machine provided by International Aid. This program was initiated on August 14, 2008. Board Member Dr. Aditya Sharma provides on-the-ground ultrasound training to staff, and Dr. Christopher Moore of Yale University's Department of Emergency Medicine provides program oversight.

The ultrasound is used for a variety of purposes:

- Obstetric: evaluation of viable IUP, fetal products gestational age, fetal lie, placental location
- Vascular: intravenous line placement
- Renal: evaluation for hydronephrosis
- Abdominal: evaluation for free fluid
- Pulmonary: evaluation for pneumothorax or effusion
- Cardiac: evaluation of myocardial dysfunction or pericardial effusion
- Skin/soft tissue: evaluation of abscess

To ensure high-quality services, every ultrasound patient has a log recorded and transmitted via secure Internet connections to Yale University's Emergency Medicine department for review and critique. The log includes reasons for the exam, demographic and health indicators, assessments of the ultrasound image quality, and treatment and follow-up.



Some typical uses of the ultrasound are described by the following cases:

Case Report #1: A 25 year old woman with three prior pregnancies and 2 surviving children presented to the clinic for routine antenatal care and second trimester ultrasound. The ultrasound revealed a normal fetal heart rate and excellent fetal activity. The placenta was seen in posterior position, with a small portion overlying the internal os. The patient is given routine antenatal care and returned to the clinic in two months to reassess placental position and monitor for a condition known as placenta previa. This essential preventive service allows for monitoring of high-risk pregnancies to prevent morbidity and potential mortality among the mother and child.

Case Report #2: A 50 year old woman presented to the clinic with large neck abscess overlying the large arteries and veins in her neck. It was unclear how deep the abscess was, and what its relation to the carotid and jugular veins was, making a "blind" intervention extremely dangerous. The ultrasound was used to find a two inch space between the vessels in her neck and the infectious abscess. This allowed safe drainage of the abscess, likely saving the patient's life.

In addition to improving patient care, the experience of rolling-out ultrasound services has been an invaluable template for rolling-out digital X-Ray telemedicine services, which are not currently available for two districts of about 500,000 people. We have currently planned for X-ray deployment in collaboration with the World Health Imaging Alliance. Our plans for this are available at:
http://www.nyayahealth.org/Library/WHIA_nyaya_xray.pdf

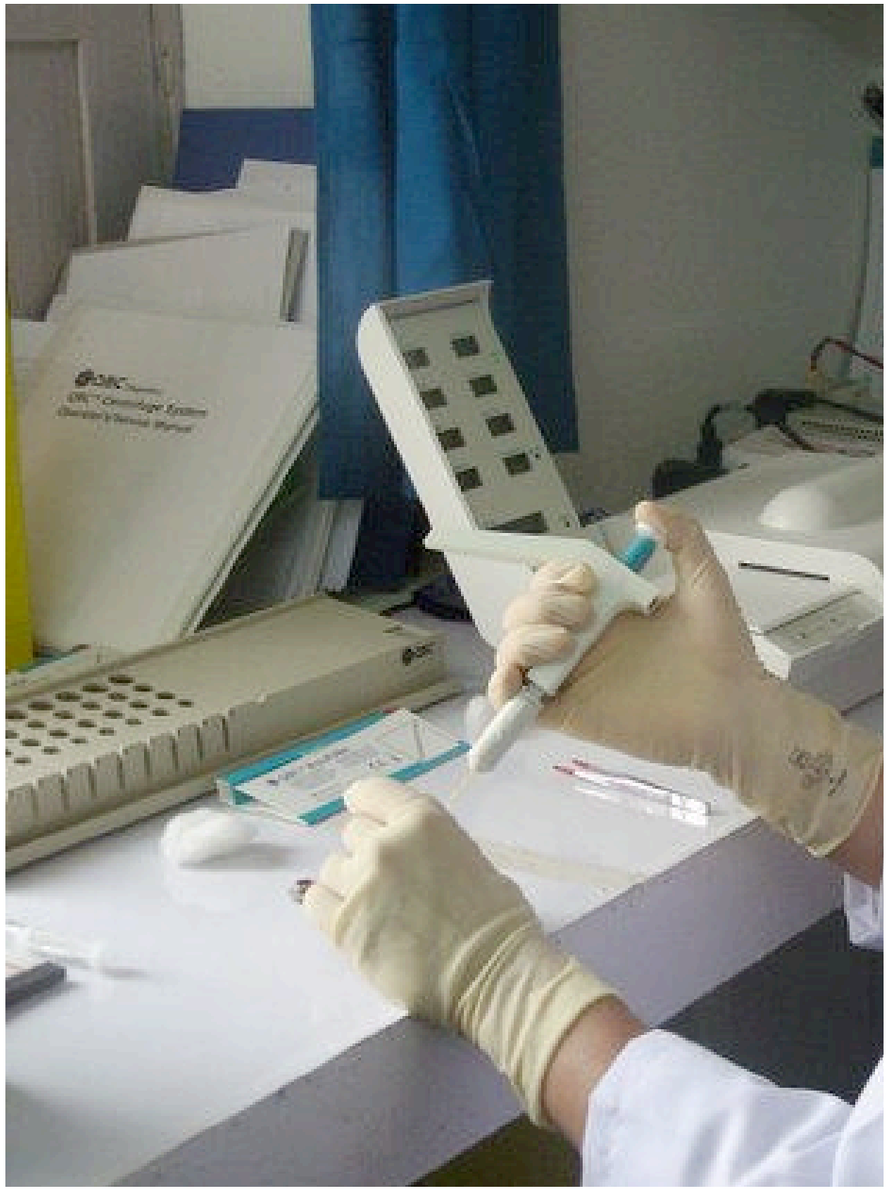
Diagnostic testing & monitoring

We currently serve as a major laboratory referral center for a region spanning over 500,000 people. We perform colorimetry-based tests, routine microscopy, tests from an auto-analyzer machine, and several rapid kit-based tests.

Following a donation from QBC diagnostics of an auto-analyzer that has transformed local laboratory capacity to meet high-level clinical standards of diagnosis and treatment, Dr. Robert Levine of Yale University also donated QBC's Paralens device, which aids us in the rapid diagnosis of TB. Paralens has high sensitivity and specificity to detect Mycobacteria, and we have begun testing sputa to detect TB early and provide comprehensive treatment and follow-up for this highly-infectious disease. Dr. Levin's invention, the AutoRead Plus, is already in full use at the clinic. This device tests for hematocrit, hemoglobin, mean corpuscular hemoglobin concentration (MCHC), platelet count, white blood cell count, granulocyte count and percentage, and a combined lymphocyte/monocyte count and percentage. These are essential tests to operate a primary care clinic, and of added value to us, the operator simply inserts the sample in to the instrument loading platform and closes the lid, after which testing is entirely automatic. The machine is perfectly suited for our use, as the analyzer is permanently calibrated during manufacturing. A simple calibration check is run daily to verify satisfactory performance prior to testing patient samples. Liquid quality control materials are used for added performance monitoring.

We have recently deployed a new I-Stat machine that was donated by Abbott Laboratories. With this technology, we aim to further expand the reach and quality of our laboratory, already the highest quality laboratory in the entire region. Our overall goal, as with any device we deploy, is to develop and test models of delivery in areas affected by poverty, war, and isolation. In piloting the I-Stat as an essential tool in resource-deprived areas with nascent health systems, we are focusing on monitoring potassium among severely malnourished children. Following an initial pilot phase, we have begun implementing the following additional programs with the machine:

- Blood tests among post-operative cardiac surgery patients receiving community-based care
- Tests to evaluate acute dyspnea among patients who may have chronic obstructive pulmonary disease, congestive heart failure, or pneumonia in a setting where X-Ray services are not widely available
- Hematologic tests to assess patients with severe hepatic derangements secondary to viral hepatitis
- Sodium and potassium monitoring in patients receiving medications in the course of community-based care for cardiac conditions
- Physiological monitoring for the management of severe sepsis, renal failure, meningitis, and pneumonia
- Rapid tests of blood status in post-partum hemorrhage patients



"People who take their destiny into their own hands assimilate the most modern forms of technology at an extraordinary rate."

- Frantz Fanon

Keeping track...

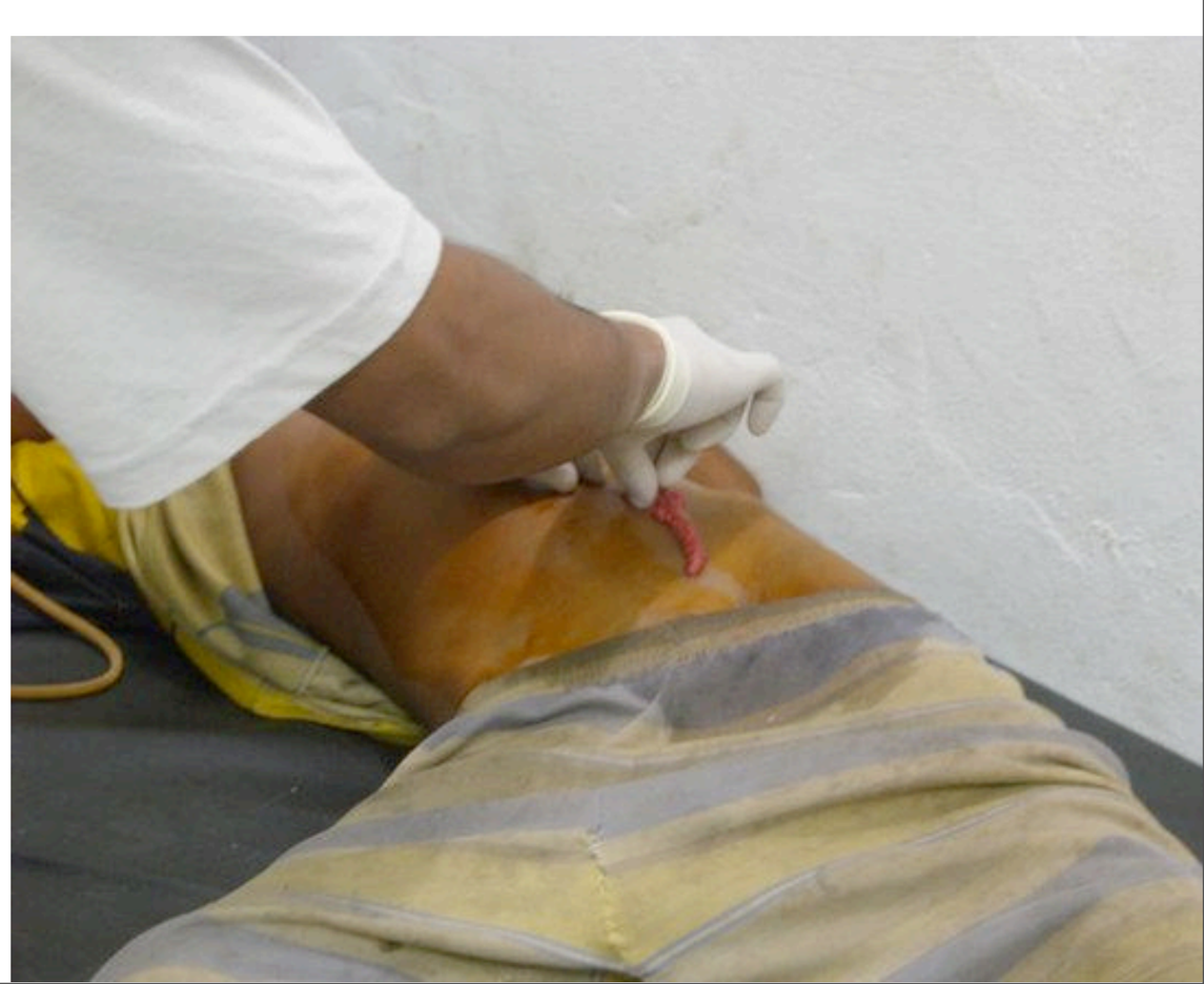
- Over the last three months, we have initiated a comprehensive electronic patient database. Our current database includes demographic, treatment, follow-up, laboratory, mortality, antenatal, and delivery data.
- We train our staff in computer literacy to enhance the use of electronic management systems at the point of care.
- As we develop automated and real-time follow-up systems for patients, we will open-source de-identified data relating the demand for service and quality of care at our clinic site, and at the new Bayalpata hospital facility.

Case Study: Surgical Injury

September 15th. A fifteen year old boy was climbing a tree near his house to collect guava fruit when he lost his balance and feel out of the tree. He wasn't very high in the tree, but was impaled on one of the branches near the bottom. He noticed a hole in his abdomen with his intestines hanging out, and walked home and showed the wound to his family, who promptly put him on a bus to our clinic.

Our physicians were at the staff quarters at night when they received word from the in-clinic nurse over walkie-talkie that a boy had arrived with his intestines hanging out. They immediately went to the clinic to investigate. The boy was sitting outside the clinic, appearing fairly comfortable, with his family next to him. His shirt covered his wound. They brought him into our treatment room and examined him.

The boy had no signs peritonitis (a surgical emergency), and a ultrasound exam revealed the absence of other danger signs. Nyaya's doctors surgically opened the patient's abdomen after applying anesthesia, to check that no foreign bodies were present and to determine the extent of the wound. The patient was given IV antibiotics and the wound was repaired.



12 hours later, the boy had already passed urine, had excellent bowel sounds (signs of recovery), and exhibited no danger signs. After three days, he had started eating and moving his bowels. He was maintained on antibiotics, had his stitches removed, and made a full recovery.

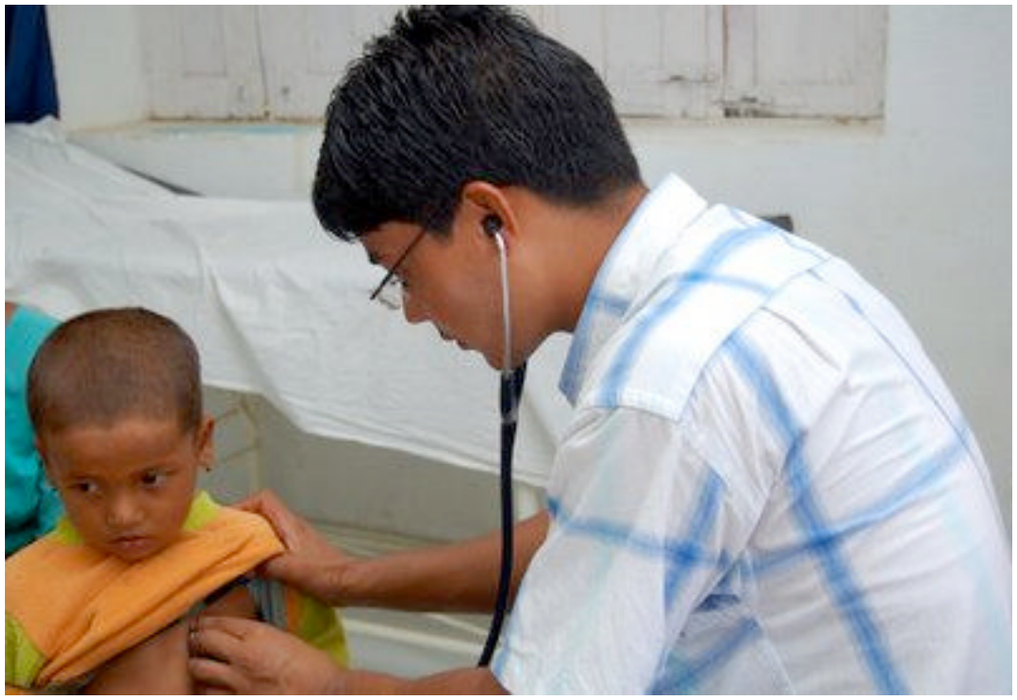
The case highlighted the need to expand surgical capacity in the region, where injuries from dangerous standards of living, the expansion of limited roads and extensive landslides, and work-related injuries remain a constant threat.

Accountability to those we serve

Every few weeks, each of our health workers invite community members to the clinic for a meeting to guide Nyaya's work. They are asked to bring people who have often been denied opportunities, to express their thoughts on how we can best serve the community and avoid the mistakes of the past...

Nearly all invited members to our community meetings have been women, illiterate, mainly dalits (the “lowest caste”) and come from the lowest-income families. We listen to all of their concerns; at our most recent meeting, we generated a list of 19 priority points that they thought could help improve our services and avoid the traps of prior government and non-government initiatives in Nepal that failed to adequately care for community members with the least power. We initiated a timeline and schedule to tackle these 19 tasks. In some cases, the task was to better communicate between healthcare staff and patients. For example, our CHWs educated clinic attendees about why it is not necessary to give intravenous glucose to every patient (a practice common among ill-trained private health workers in the region, as it can often make people feel better without having medical value, and sometimes causing harm).

For those issues that were not simply educational, we held a special session of the Clinic Management Board. We recognized that a lot of concerns stemmed from high patient loads at clinics in this region: that doctors do not spend enough time with patients; that waiting lists are long and patients have to leave to work in the rice fields; that patients who are very sick have to wait before being seen. The Board swiftly implemented several protocols to help ensure that Nyaya services could avoid these problems: hiring a health assistant to enhance the triage system and improve patient flow, ensure our triage system prioritized patients based on the severity of their illness, and starting early registration at 7 am so patients could be identified early in the day and finish their work to come see the doctor at a later time.



...Another concern among community members was ensuring that antenatal care is provided on all days of the week. Typically such care is delivered on weekdays to prevent overburdening of laboratories, allowing them to group similar tests. We learned that this resulted in pregnant women being unsure about when to go the clinic. Instead of trying to explain laboratory schedules to every pregnant woman in the community, we hired a new laboratory assistant so that all laboratory services are available every day of the week. We've seen a rise in visits among women seeking preventive antenatal services as a result.

Finally, we address concerns about poverty. In particular, many community members are rightly concerned about the lack of support for malnourished children in the region. We quickly consulted with malnutrition experts within Nepal and the US, appointed a new Board of Advisors member with specialization in the subject, and drafted a protocol to assess and assist malnourished children at the clinic. We are now expanding a malnutrition prevention and treatment program in the community using ready-to-use therapeutic food (RUTF), which is high in key nutrients and helps severely-malnourished children regain strength and achieve important growth indexes.

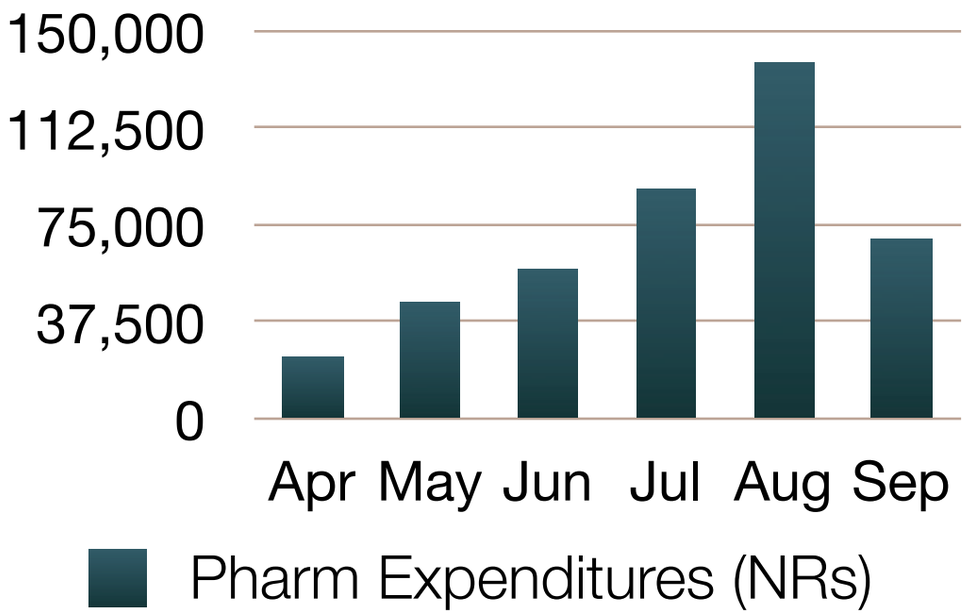
As we continue to operate, there are a number of requests from the community that we hope to achieve in the next quarter: the need for an X-ray (given the high incidence of falls and trauma) and safe abortion services (given the persisting gender inequality and lack of reproductive services). We are continuing to take strides in engaging the most marginalized among our community members through community meetings that are the cornerstone of Nyaya's mandate to be accountable to the people we serve.

Optimizing operations

As word has spread through nearby villages that Nyaya provides modern, comprehensive care, demand has increased rapidly. From 7 patients on our inaugural day, we now see an average of 140 patients per day. This has strongly challenged our clinical team to provide high-quality, equitable care to patients.

The nearest surgical and inpatient referral facility is 7 hours away. Approximately 60% of our patients walk over 2 hours to get to the clinic. We have focused our resources on the dire public health problems in the area that we can effectively address and measure, such as pneumonia, trauma, malnutrition, dehydration, tuberculosis, antenatal care, and safe delivery. For patients who require more complex primary care, we offer them clear counseling on what they can do, and facilitate their prompt and appropriate referral, transportation, and follow-up at district hospitals.

To ensure that we provide the highest-quality medical care, and do not step beyond our reach, we've tested and implemented a comprehensive triage system. This system promptly categorizes persons by detecting early warning signs that indicate whether they have a serious ailment, providing them appropriate review and examination by a skilled medical attendant suitable for their disease, and rapidly delivering therapy and arranging for immediate transport in the case of severe conditions that require hospital-level care.



But much of providing responsible care is about ensuring a reliable system. The behind-the-scenes work of developing appropriate and reliable supplies and pharmaceuticals is vital to this endeavor. In addition to monitoring our supplies, we also make sure that we appropriately use medications. As a result, we underwent a full audit of our pharmaceutical expenditures in early September, and found that two sets of medications--those used to treat lower back pain and those used to treat indigestion--could be more effectively regulated. By instituting new protocols for their use, we were able to more efficiently focus our finances on the most useful and necessary medications, and reduce wasteful spending.

Case Study: Pediatric Emergency

September 20th. A 10 year old boy with epilepsy had a seizure and fell into a fire, severely burning his hand. Given his family's economic constraints, he wasn't able to come to our clinic until about 14 hours after the injury. He had a mixture of second and third degree burns, having lost essentially all sensation along his forearm and hand. We cleaned his wound and removed dead tissue to allow it to properly heal, provided antibiotics, applied burn treatments, and facilitated his transport to a surgical center located twelve hours away. We follow this patient to ensure his successful recovery and proper treatment of his epilepsy.

This was another case in which a child's life was saved, but the lack of adequate health infrastructure requires us to rapidly scale-up surgical services to responsibly address critical conditions.

The next steps...

We must immediately address the need for inpatient, emergency obstetrical, and surgical services in the region of Achham. To do so, we have developed an extensive plan to renovate an abandoned hospital...

After numerous requests from community members and staff, Nyaya Health has initiated a plan to renovate and equip a previously-abandoned hospital in the region, to complement our clinic-based primary care services with essential obstetrical, surgical and inpatient care. The training, implementation and evaluation of this program have been detailed by international experts and coordinated with the local government.

A 46-page implementation document, budget and timeline are located online:
http://wiki.nyayahealth.org/SurgicalServices

The Bayalpata Hospital Initiative

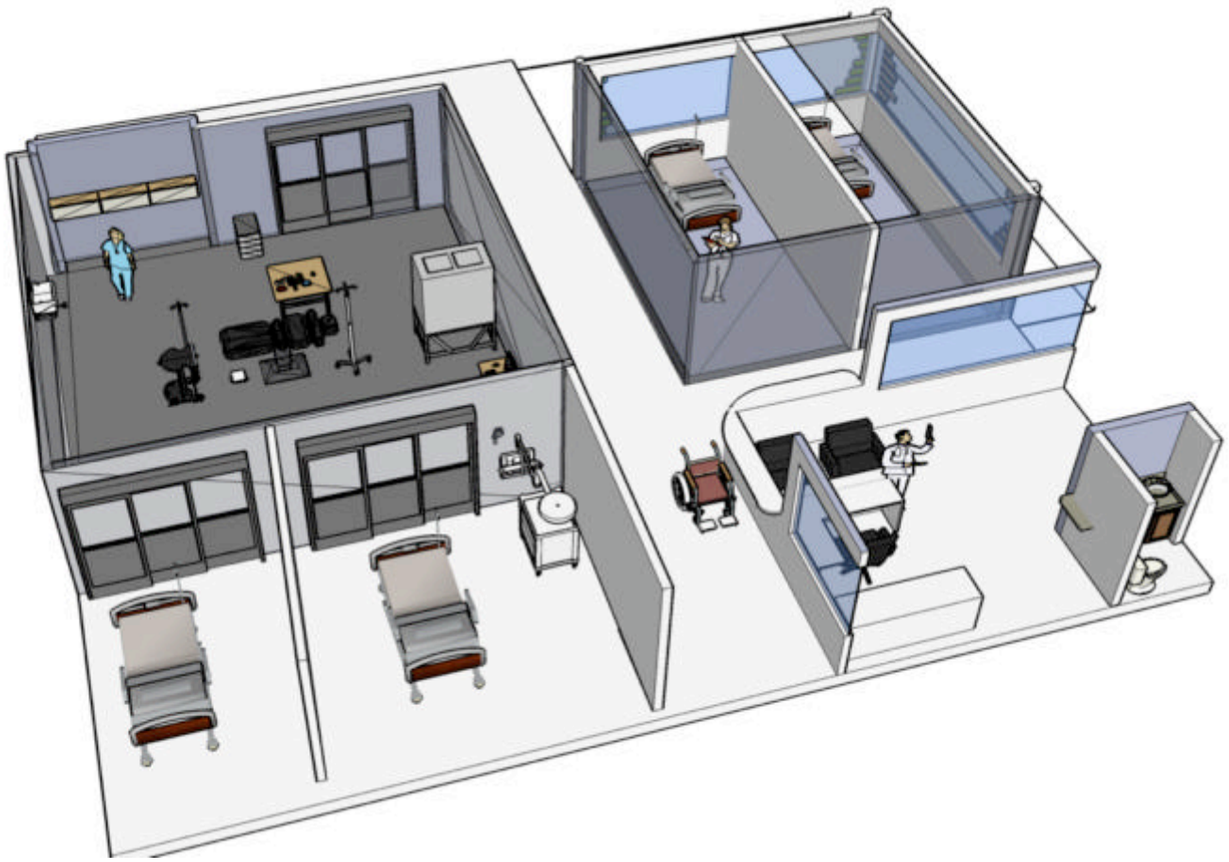
Local citizens and government officials have offered to us an abandoned hospital near to our current clinic to renovate and deploy essential inpatient and surgical services, as well as training programs. In keeping with the model we have developed at our clinic, the expansion to provide these services will complement general primary care and serve as a community-driven initiative to provide training, sustainable infrastructure, and high-quality medical standards for service delivery in the region. This will involve the following key actions, listed in the order of their planned implementation:

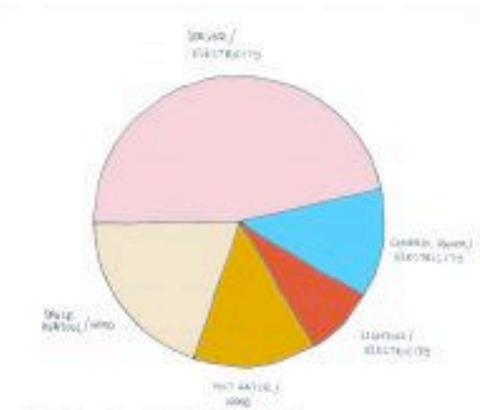
- renovating the abandoned government hospital in the neighboring village of Bayalpata;
- expanding primary care, normal delivery services, and community health worker programs to the hospital;
- establishing X-Ray services;
- building a 14-bed inpatient ward to support our existing 24-hour maternity services;
- establishing blood transfusion capacity;
- expanding our existing high-quality laboratory services, including culture microbiology;
- developing a surgical team capable of delivering essential surgical services including Cesarean sections, appendectomies, and basic orthopedic procedures.

To achieve our objectives, we have created a step-wise plan of implementation and assigned project directors to oversee these steps. We have detailed the protocols and procedures that will be followed during the construction and expansion of services, produced contingency plans in the event of potential obstacles, and crafted an efficient but comprehensive budget for this initiative.

We are working with the local government and are receiving expert guidance from Boston's Architecture for Humanity organization, and the Brigham and Women's Hospital's Center for Surgery and Public Health to deploy the Bayalpata Hospital Initiative.

To renovate the site, Nyaya is collaborating with the Boston chapter of Architecture for Humanity. The group is employing an architectural approach known as evidence-based design to renovate the facility. Evidence-based design is an architectural movement that seeks to rationally design the logistical and engineering aspects of institutional facilities to improve their ability to serve their intended need; the principles of design have not yet been incorporated into a resource-poor environment like the Achham region, where most buildings are often ill-suited to the function of providing effective healthcare. The aim of this aspect of the initiative is to improve energy efficiency, heating and cooling, and effective triage and arrangement of patient and provider areas to maximize the potential for effective and efficient clinical interventions. In October, the Nyaya-Architecture for Humanity Team presented its initial work to the Conference on Disparities and Surgical Care in Boston, Massachusetts.





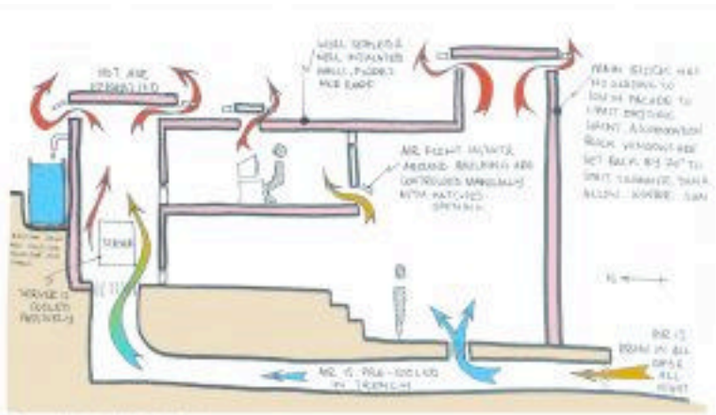
Annual Energy Consumption By End Use / Fuel Source

Being data-intensive a large proportion of the building energy consumption is associated with keeping the servers running. Some of this energy is returned into the building as heat which helps to keep the energy requirement for heating low.

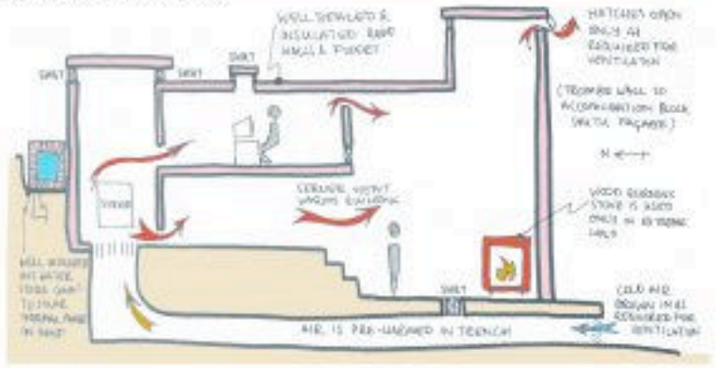
Although the accommodation block has a high demand for hot water, most of this is met by the solar thermal panels. The small remainder, shown here, is heated by burning wood.

The energy for heating and hot water energy is derived from locally-sourced wood so is carbon neutral. The lighting energy consumption is low through the use of energy-efficient lighting whilst the general power energy consumption is typical of a building of this type.

With the passive measures described adjacent there is no energy required for cooling and ventilating the building.



Summer Heat and Ventilation Strategy



Winter Heat and Ventilation Strategy

As part of the process of expanding beyond maternal mortality onto broader comprehensive surgical care, Nyaya has developed a collaboration with the Brigham and Women's Hospital's Center for Surgery and Public Health. The Center, led by surgeon Dr. Selwyn Rogers, is helping to provide Nyaya with oversight and evaluation as the hospital is renovated, critical protocols are produced, and patients are evaluated and treated. These types of collaboration between academia and Nyaya Health continue to provide essential training, quality improvement, and expansion of comprehensive care through our telemedicine and infrastructure development programs.

Our telemedicine program has also continued to expand, and will be integrated with the Bayalpata initiative. A site visit and field assessments were performed last month by the engineering firm Max Fordham, which won the prestigious Open Architecture Network award for their design of a Nyaya Health telemedicine and community education center. We continue to work with Max Fordham to implement their design in Achham, bringing a community center for public engagement, Internet access, and health education to the region.

To contribute to our work, connect with us online:
http://nyayahealth.org/donate_now.html

As always, 100% of donations go directly to medical services,
because our operations and overhead are managed by volunteers.

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