Primary Care Prize Winners from Prior Nine Years of Competition

2017 Winners:

$175,000 Awarded to Students in 2017 Primary Care Technology Competition

Each year this unique competition for student innovations in primary-care technology has awarded major funding prizes to the most promising of the many projects submitted. The 2017 First-Place Prize of $100,000 goes to Robert Mannino and his team at Georgia Tech for their innovative work to develop Non-invasive Technology for Patients’ Self-Management of Anemia.

Second-Place Prize of $50,000 goes to Charles Rabolli and his team at Rutgers University for a Rapid Point-of-Care Diagnostic to Discriminate Viral From Bacterial Infections.

In addition, each of the five Finalists from the large field of entrants in this competition received Awards of $5,000 to further their work and careers. All five Finalists and the full titles of their projects are listed at the end of this announcement. With these results, the portfolio of student-led primary-care projects supported by Prize funds over its nine-year history expands to eighty-five. The objective of all these projects has been to improve primary-care delivery at the frontlines of medicine and to advance the careers of engineering students working on challenges in that domain. Support from Prize Funding has also helped teams advance their work toward commercialization and dissemination.

In announcing the winners of this eighth annual national Prize for Primary Healthcare, Ronald Newbower, PhD, Director of the APF’s Prize competition, stated “Each year we have been delighted with the quality of the entries this Prize competition has elicited from engineering students around the country. They are clearly eager to develop innovative technologies to address international as well as national challenges in primary care. We hope they will serve as role models for others in their field. We are proud to have been able to support their efforts.”

Dr. Benjamin Crocker, Medical Director of the MGH APF, added “In our commitment to improve the paradigm of care for patients, we seek new tools, enabled by novel technologies, which can improve our ability to make rapid and more accurate medical decisions and engage patients in their care, whether patients are in the clinic or elsewhere. We believe that with such tools, the primary-care teams of the future will play an even more effective role in streamlining diagnosis and treatment, thereby reducing the cost and adverse outcomes that result from inefficiency and delay in appropriate care.”
About This Prize for Student Innovation in Technology for Primary Healthcare

These awards have been made possible through a generous gift from the Gelfand Family Charitable Trust. “The challenge of delivering affordable excellent primary care presents an opportunity for those students interested in engineering solutions to make truly profound contributions” said Mark Gelfand, a principal in the trust. “I am pleased with the continued success of this unique competition in driving toward that goal.”

About the Ambulatory Practice of the Future

Launched in 2010, The Ambulatory Practice of the Future (APF) is an innovative team-based patient-centered primary care practice at Massachusetts General Hospital (MGH). APF serves its employee population and their dependents in innovative ways not tied to the traditional office-visit paradigm, and with a reimbursement model reflecting quality of overall care outcomes rather than volume of visits or encounters. APF also collaborates with academic and industry partners to explore new pathways of care and new technologies with an eye towards efficiency, cost-efficacy, improvement of the patient experience, increased career satisfaction for primary-care teams and improved long-term outcomes. With this Student Prize Competition, the APF has engaged the creativity of engineering students nationally, at dozens of universities.

Additional Information

Additional information about the Prize for Primary Healthcare as well about the MGH APF may be found at http://massgeneral.org/apf

The Five Finalists and Their Projects:

Robert Mannino, Georgia Tech; Noninvasive Inexpensive Smartphone App for Patient Self-Management of Anemia (First Place)

Charles Rabolli, Rutgers University;
Point-of-Care Diagnostic for the Detection of Viral Versus Bacterial Infection (Second Place)

Anarup Ganguli, University of Illinois at Urbana-Champaign;
Molecular Testing on Your USB Stick

Chris Idelson, University of Texas at Austin;
Novel System to Mitigate Intrauterine Device Expulsion, with Focus During the Postpartum Period

Ruchi Patel, The Cooper Union;
QuickStitch: The Single squeeze Stitcher
2016 Winners:

**Anurup Ganguli**, a graduate student in Bioengineering at the University of Illinois, Urbana-Campaign, leads the team winning this year’s First Prize award of $150,000. Their project “Personalized Multiplexed Molecular Diagnostics for Point-of-Care Setting” offers a novel technology for rapid detection of infectious diseases in all primary-care settings. The students’ passion is to drive cost down and allow testing in resource-limited countries, using blood samples from a simple finger prick. The other members of the team are Akid Ornob, Tanmay Ghonge, and Damhorst Gregory. Professors Rashid Bashir and Brian Cunningham guided and mentored their efforts. The team’s further work to refine and propagate the technology will be accelerated by this $150,000 award, with the ultimate goal of having a significant impact on healthcare challenges worldwide.

**Lindsey Fernandez**, a Bioengineering candidate at the University of Pennsylvania wins the second prize of $100,000 to support her further work. Her team’s unique development is a simple lot-cost device for individuals to self-screen for cervical cancer without the need for a central lab. With early diagnosis and treatment invasive cervical cancer is highly preventable. Yet at present nearly 300 thousand deaths from this cancer occur worldwide each year. With the aid of community health workers, her technology could have extraordinary impact. Other members of her team are Divyansh Agarwal, Sonya Davey, Kent Grosh, Alex Kubo, and Thulani Tsabedze. Professor Mark Yim mentors the effort.

Third place and $50,000 goes to Bioengineering graduate student **Nuttada Panpradist** of the University of Washington. Her team’s project addresses another one of the many primary-care needs of low-resource settings – providing technology for easy and accurate assessment of HIV drug resistance. Nearly 40 million individuals worldwide are living with HIV, with antiretroviral therapy as key to the potential for near-normal lives and near-zero risk of transmission. Yet resistance to those drugs is on the rise. Ongoing testing is routine in developed countries, but is too expensive for low-resource areas of the world most plagued by the disease. Their technology could offer rapid point-of-care testing for more effective management and improved outcomes. This work was developed under the guidance of Associate Professor Barry Lutz.

In addition, seven other Finalists in this competition have received $10,000 each to further their work and careers. They are all listed below.

In announcing the winners of this eighth annual national Prize for Primary Healthcare, Ronald Newbower, PhD, Strategic Advisor of the MGH APF and Director of its Prize competition, stated, “We are delighted with the quality of the entries this Prize competition has elicited each year from engineering students. They are clearly eager to develop innovative technologies to address international as well as national challenges in primary care. We believe the winners of these major awards are headed toward truly significant careers and may well serve as role models for others in their field. We are
proud to be able to support their efforts.” Dr. Benjamin Crocker, Medical Director of the MGH APF, added “In our commitment to improve the paradigm of care for patients, we seek new tools, enabled by novel technologies, which can improve our ability to make rapid and more accurate medical decisions and engage patients in their care, whether patients are in the clinic or elsewhere. We believe that with such tools, the primary-care teams of the future will play an even more effective role in streamlining diagnosis and treatment, thereby reducing the cost and adverse outcomes that result from inefficiency and delay in appropriate care.”

About This Prize for Student Innovation in Primary Healthcare:
These awards have been made possible through a generous gift from the Gelfand Family Charitable Trust. “The challenge of delivering affordable excellent primary care presents an opportunity for those students interested in engineering solutions to make truly profound contributions” said Mark Gelfand, a principal in the trust. “I am pleased with the continued success of this unique competition in driving toward that goal. Innovation in primary care could help many families, and I am confident that much good will result from these inspiring projects.”

The Ten Finalists for 2016 (alphabetically by University):

Mustafa Unal, Case Western Reserve University
“An Automated Point-of-Care Raman (POCR) Device for Facile and Rapid Diagnosis of Crystal Induced Arthropathies”

Kunaal Naik and Manav Sevak, Georgia Institute of Technology
“Using Mobile Messaging to Streamline Care Transitions”

Niko Temofeew, Saint Louis University
“Reducing Debilitating and Costly Foot Complications for Patients with Diabetes”

Hayley Chong, University of California, San Diego
“Open Viral Load”

Anurup Ganguli, University of Illinois at Urbana-Champaign
“Personalized Multiplexed Molecular Diagnostics for Point-of-Care Setting”

Qian Cheng, University of Illinois at Urbana-Champaign
“Population Screening for Chronic Disease Using Smartphone Sensors”

Lindsey Fernandez, University of Pennsylvania
“SelfCerve: Low-cost, At-home, Visual Screening Tool for Cervical Cancer in Low Income Countries”
Rahil Jain, University of Washington
Cloud Connected System for Augmenting Existing Rapid Diagnostic Test Performance

Nuttada Panpradist, University of Washington
“OLA-SIMPLE: A Point-of-Care Genotyping Device to Enable HIV Drug Resistance Testing”

Allen Osgood and Robert Chen, Washington University in St. Louis
“Memento – Alzheimer’s Diagnostics on Mobile Platform”

About the Ambulatory Practice of the Future:
Launched in 2010, The Ambulatory Practice of the Future (APF) is an innovative team-based patient-centered primary care practice at Massachusetts General Hospital (MGH). APF serves its employee population and their dependents in innovative ways not tied to the traditional office-visit paradigm, and with a reimbursement model reflecting quality of overall care outcomes rather than volume of visits or encounters. APF’s Innovation Learning Program collaborates with academic and industry partners to explore new pathways of care and new technologies to address the challenges in primary care with an eye towards building more efficient and cost effective care, improving the patient experience, increasing career satisfaction for primary-care teams and improving long-term medical outcomes. With this Student Prize Competition, the APF extends its reach for new ideas nationally, and has engaged the creativity of engineering students at dozens of universities.

Additional Information:
Additional information about the Prize for Primary Healthcare as well about the MGH APF may be found at http://www.massgeneral.org/apf
2015 Winners:

Yunus Alapan, a graduate student in Mechanical and Aerospace Engineering at Case Western Reserve University, leads the team winning First Prize in this unique national competition for novel technologies for more effective delivery of primary care in medicine. Their project offers caregivers a novel inexpensive point-of-care device to diagnose sickle-cell disease (SCD). The students' passion was driven by the serious need for better SCD diagnosis and care in resource-limited countries, particularly in Sub-Saharan Africa where the prevalence of SCD is the highest. According to the World Health Organization, hundreds of thousands of infants die yearly for lack of early diagnosis – primarily due to lack of access to clinics with the technology to screen for the disease and thus allow early life-saving intervention. This small battery-operated device has the additional unique ability to easily identify other hemoglobin disorders, and thus to fill primary-care needs in other countries throughout the world. The other members of the team are Ryan Ung, Noman Hasan, Tolulope Rosanwo, Dr. Connie Piccone, and Dr. Jane Little. They developed this project under Dr. Umut Gurkan's mentorship and guidance. The team's further efforts to refine and propagate the technology will be accelerated by this $150,000 award, with the ultimate goal of a significant impact on worldwide efforts to reduce deaths in infants and young children.

Second place, and $100,000, went to a project developing an efficient, low-cost, automated system for diagnosis of hearing loss in primary-care settings. It is led by Xinyu David Song, a Biomedical Engineering graduate student at Washington University in St. Louis. While approximately 10% of American adults report some degree of hearing loss, making it the most common neurological disorder, primary-care clinicians lack the ability to reliably screen for this issue. Even if concern is voiced, clinicians typically have to refer patients to secondary centers for testing with sophisticated equipment, at significant cost. Thus this disorder is severely underdiagnosed, and individuals who could benefit from hearing assist devices live a lower quality of life, unnecessarily. This student team has developed a novel approach to screening and precise testing of hearing, which overcomes obstacles to use in primary care clinics and practices. It is inexpensive, efficient and easily scalable. This award will allow them to proceed beyond their early demonstrations of efficacy, with the goal of reaching a larger population and ultimate commercial adoption.

Third place and $50,000 goes to a student team from Johns Hopkins University, led by Biomedical Engineering undergraduate student Huilei Wang. Their project addresses another one of the many primary-care needs of low-resource settings – providing technology for easy and accurate monitoring of uterine contractions during labor and delivery. With better monitoring, in a less labor-intensive manner, midwives can react more effectively to obstructed labor and lower mortality. According to the WHO, the rates of maternal deaths in developing countries are 15 times greater than in developed countries – roughly 1000 deaths every day – of which an estimated 80% would be preventable through better monitoring of labor progression. This team has
already found excellent potential acceptance of their technology to provide this data for midwives, via a pilot study in three clinics in Tanzania. This prize will support their refinement of the system, with the hope of wide adoption, reducing maternal deaths as well as newborn mortality.

In addition, seven other Finalists in the competition, listed below, have received $10,000 each to further their work and careers.

The Ten Finalists’ for 2015 (alphabetically by University):

Yunus Alapan, Case Western University
“HemeChip for Point-of-Care Diagnosis of Sickle Cell Disease in Pediatric Patients”
(First-Place Winner)

Erik Zavrel, Cornell University
“Tongue Strengthening as an Alternative Treatment for Obstructive Sleep Apnea”

Gregory Fedorchak, Cornell University
"Active Distal Limb Heating for the Treatment of Insomnia"

Ashish Aman, Johns Hopkins University
“Pranapulse”

Malvi Hemani and Huilei Wang, Johns Hopkins University
“Monitoring Uterine Contractions for Low-Resource Clinical Settings”
(Third-Place Winner)

Jordan Matelsky, Johns Hopkins University
"Rural Health Kiosk: Providing Primary Care in Rural India"

Elaine Ng, Stanford University
"Specific and Sensitive Magnetoresistive Sensor Array for Multiplexed Allergen Detection"

Chien-nan Chen, University of Illinois at Urbana Champaign
“CyPhy: 3D Interactive Cyber-Physiotherapy in Remote Districts and at Homes”

Jimmy Ni and Chul Shin, University of Illinois at Urbana Champaign
"New Scope Wearable Microplasma Phototherapy Treatment for Psoriasis"

Xinyu Song, Washington University at St. Louis
"An Efficient Automated System for Primary Care Diagnosis of Hearing Loss"
(Second-Place Winner)
2014 Winners:

James Dieffenderfer, a graduate student at North Carolina State University, led the team winning First Prize in this unique national competition for novel technologies for more effective and efficient primary care. Their project involved developing a very low-cost, compact, handheld spirometer, with high dynamic range, that communicates to a cell phone and server to enable a complete ecosystem for patient, caregiver, and physician to collaborate in the management of asthma or COPD. Their further efforts will be accelerated by this $150,000 award.

Second place, and $100,000, went to the project entitled “HemoGlobe”, led by Kevin Colbert, a graduate student at Johns Hopkins University. Their innovative technology is a noninvasive, low-cost, telemedicine-enabled hemoglobinometer, with the potential to shift the paradigm for anemia screening in under-resourced areas of the world. It can allow community health workers to appropriately counsel pregnant women on needed actions.

Third place and $50,000 is going to a graduate student, Mao-Chi Weng, at Boston University, for a project entitled “Developing an mHealth Platform for Primary-Care Behavioral Interventions”. In addition, seven other Finalists in the competition received $10,000 each to further their work and careers.
2013 Winners:

This year’s top prize of $150,000 went to a student team co-led by undergraduate students Andrew Brimer and Abigail Cohen, Washington University in St. Louis, for their innovative low-cost spirometer. It offers unique personalized capabilities for asthma patients to use in proactively managing their respiratory challenges. The sensor offers this superior performance in a rugged, compact format with no moving parts. Associated software converts the acquired data into formats of direct real-time help to the patient as well as with longer-term value for their primary-care team’s decision processes.

The second prize of $100,000 goes to Sylvia Natividad, a graduate student at the University of California, Berkeley for a unique and promising new approach for cell sorting of blood samples. The most immediate application is for HIV patients managing their medications in limited-resource settings. Her technology requires no electrical power and utilizes very low-cost disposables to easily establish CD4+ cell counts from small samples.

Allen Cheng, a graduate student at MIT, leads the team winning third prize, receiving $50,000, for their sophisticated and clever design for an automated medication dispenser for patient use at home. Their system employs novel human-factors engineering, directed at the formidable challenges patients face if they require multiple medications with varying daily time schedules. Clever mechanical design deals with dispensing a variety of pills with high reliability according to the prescribed protocols.

Ten Finalists for 2013:

This year’s competition began in February 2013, with ten finalists chosen from a broad national portfolio of 75 preliminary entries. Each finalist team received $10,000 in February to assist in the preparation of their full entry due in June. The three top winners announced here were chosen from those student teams of Finalists. The ten are listed here in alphabetic order:

Alexander Abraham and Brian Cummins (co-leaders), Texas A&M University: “An Innovative Implantable Biosensor for Continuous Blood-Glucose Monitoring”

Andrew Brimer and Abigail Cohen (co-leaders), Washington University in St. Louis: “Low-Cost Spirometer Designed to Revolutionize Asthma Management via Patient Empowerment”

Allen Cheng, MIT: “Smart Automated Medication Dispenser: Driving Medical Adherence through Patient-Inspired Engineering”

Anmol Chopra, Johns Hopkins University: “Rapid MDR-TB Diagnostic for Peripheral Facilities in the Developing World”
Hasitha Dharmasiri, Rice University: “mobileSpiro: A Portable System for Accurate, User-Friendly Spirometry”

Nga Ho, Boston University: “A highly sensitive, point-of-care, multiplexed virus-detection platform for HIV, Hepatitis B and Hepatitis C”

Guillermo Monroy, University of Illinois, Urbana-Champaign: “Quantitative Depth-Resolved Otoscopy”


Jacob Trueb, Boston University: “Microchip Cartridge for Point-of-Care Allergy Diagnostics”

Shawn Wen, MIT: “PortaTherm: A Novel, Electricity-free Typhoid and Paratyphoid Diagnostic System for Resources-
2012 Winners:

First Prize of $150,000 goes to Jason Boggess and Everett Lawson, of MIT for their project “Fast Retinal Imaging for Diverse Screening via Binocular Coupling”, aimed at more effective point-of-care diagnostics of eye disease through a wider field of view.

Second Prize of $100,000 goes to Mozziyar Etemadi, University of California, San Francisco, for this team’s project "A New Cloud-Enabled Technology for Monitoring Heart Failure at Home", directed at a telehealth approach to managing these patients.

Third Prize of $50,000 is divided between two teams which tied. Daniel DeDora of the State University of New York, Stony Brook, attacked the difficult challenges of blood-glucose monitoring for diabetics, with “GlucoREAD Patch: A Novel Non-invasive Continuous Glucose Sensor Using Near-Infrared Spectroscopy and an Optical Probe” And Monika Weber, an undergrad at Yale University, tied with her team’s project “Alpha-Screener: Rapid Pathogen Detection and Antimicrobial Test”, directed at the challenges of rapid point-of-care testing of small samples of patient’s blood.

Ten Finalists and Collaborators for 2012 (in alphabetical order):

Omid Akhavan, Johns Hopkins University, in collaboration with students James Barger, Divya Maxwell, Luis Soenksen, and Luccie Wo  
Project Title: “Innovistics Point-of-Care Fever Differential Diagnostic Tool”

Jason Boggess, Massachusetts Institute of Technology, Media Laboratory, in collaboration with student Everett Lawson 
Project Title: “Fast Retinal Imaging for Diverse Screening via Binocular Coupling”

Daniel DeDora, State University of New York, Stony Brook University, in collaboration with students Nicholas Pallotta, Atulya Prasad, Aleks Klimas, and Sayan Chowdhury 
Project Title: “GlucoREAD Patch: A Novel Non-invasive Continuous Glucose Sensor Using Near-Infrared Spectroscopy and an Optical Probe”

N. Gozde Durmus, Brown University, in collaboration with students Erik Taylor and Kim Kummer 
Project Title: “Using Nano-material Science to Inhibit Medical Device Infections”

Mozziyar Etemadi, University of California, San Francisco, in collaboration with student Kendra Johnson 
Project Title: “A New Cloud-Enabled Technology for Monitoring Heart Failure at Home”

Raymond Kozikowski, University of Florida, in collaboration with students Sarah E. Smith and Jennifer A. Lee  

Margo Monroe, Boston University, in collaboration with students Alex Reddington, Jacob Trueb, and Joey Greenspun
Project Title: “POC Instrument for Highly Sensitive, Quantitative, and Multiplexed Allergy Diagnostics in Whole Blood”

Guillermo L. Monroy, University of Illinois at Urbana--Champaign, in collaboration with students Cac Nguyen and Nathan Shemonski

Project Title: “Primary Care Imaging”

Eric Salm, University of Illinois at Urbana--Champaign, in collaboration with students Bobby Reddy, Carlos Duarte, and Brian Dorvel

Project Title: “Integrated ‘Lab-on-a-Transistor’: Droplet-Based Polymerase Chain Reaction with Electrical Detection”

Monika Weber, Yale University, in collaboration with students Kara Brower, Brian Goldstein, and Phillip McCown

Project Title: “Alpha-Screener: Rapid Pathogen Detection and Antimicrobial Test”
2011 Winners:

A graduate-student team led by George Daaboul, a PhD candidate at Boston University, has been chosen to receive the top honor in this year’s Primary Healthcare Prize competition. Their project involves a promising technology for highly sensitive and specific viral detection in a simple, easy-to-use and affordable device. Their reward is $150,000 to support their further work in developing this novel technology, with its potential for facilitating more effective and efficient primary care.

Second place and $100,000 is awarded to an undergraduate-student team at Yale led by Elliot Swart. Their project utilizes innovative 3-D optical technology to ease and speed the assessment of potentially malignant melanocytic nevi (moles on the skin). Easy assessment in the primary-care setting can be expected to increase the screening and early detection of malignancies such as melanoma, and thus contribute to improved outcome.

Third place and $50,000 goes to Melodie Benford, a PhD candidate at Texas A&M University, who is leading work on a compact and portable device for use in the ambulatory setting and in ambulances for the quick detection of biomarkers indicative of a myocardial infarction. More rapid assessment of developing heart attacks is key to proper treatment and improved outcomes.

Ten Finalists for 2011:

This year’s competition began in February, 2011, with ten finalists chosen from a broad national portfolio of preliminary entries. Each finalist team received $10,000 to assist in the preparation of a full entry due in June. The three top winners listed above were chosen from these Finalists:

Brian Bell Jr., Massachusetts Institute of Technology
Collaborators: Steve Xu and Michael Simoni, Harvard Medical School
Title: “GetWell: Innovative web-based tool to address health literacy”

Pablo Bello, Massachusetts Institute of Technology
Collaborators: Carson Darling and Thomas Lipoma, MIT
Title: “Somnus - Sleep Diagnostics Shirt”

Melodie Benford, Texas A&M University, Third Prize Winner
Title: “An Innovative Point-of-Care Blood Biomarker Device for Diagnosing Heart Attacks”

Yoonju Cho, Johns Hopkins University
Collaborators: Vikram Aggarwal, Mohsen Mollazadeh and Abhishek Rege, Johns Hopkins University
Title: “Noninvasive Measurement of Central Venous Pressure for Primary Care Environments”

George Daaboul, Boston University, First Prize Winner
Collaborators: Rahul Vedula, Abdulkadir Yurt & Xirui Zhang, Boston University
Title: “Rapid Label Free Multi-pathogen Diagnostic Platform with Multi-Parameter Single Virus Detection for Point of Care Setting”

**Matt Dubach**, Northeastern University
Collaborator: **Kate Balaconis**, Northeastern University
Title: “Lighting up Diagnostics: Continuous Monitoring of Electrolyte Imbalances”

**Kejia Li**, Kansas State University
Title: “Everyday Carry Wireless Health Monitor with Customizable Surface Components”

**Asanterabi Malima**, Northeastern University
Collaborators: **Jaydev Upponi** and **Cihan Yilmaz**, Northeastern University
Title: “Highly Sensitive Micron Scale In-vivo Biosensor for Multiple Biomarker Detection”

**Elliot Swart**, Yale University, Second Prize Winner
Collaborators: **Nickolas Demas** and **Elizabeth Asai**, Yale University
Title: “Low Cost Scanner for Monitoring Shape, Color, and Volume Characteristics of Melanocytic Nevi”

**John Waldeisen**, University of California, Berkeley
Collaborator: **Benjamin Ross**, University of California, Berkeley
2010 Winners:

**Mark R. Hartman, a Cornell University** PhD candidate in Biological and Environmental Engineering will lead the team chosen to receive the $150,000 top honor in the 2010 CIMIT Prize in Primary Healthcare competition. His team’s project, "Rapid Multiplexed Detection of Pathogens with DNA Nanobarcodes", seeks to apply novel DNA-based “fluorescence nanobarcodes” as a platform technology for multiplexed rapid clinical diagnoses in primary care. The novel technology offers the promise of a one-step quick point-of-care test for an array of pathogens possibly responsible for pharyngitis. This diagnostic tool would allow timely and accurate triage of sore throats. It is based on a powerful platform technology, first developed by scientists at Cornell several years ago, and licensed by them to a startup company.

Second prize rewards a second Cornell-based team of innovative students for their project that uses continuous ultrasound therapy for more efficient help in managing chronic pain. Beyond the initial use of pain-management drugs, patients with chronic conditions such as osteoarthritis and sciatica are most often referred for periodic short therapy treatments with ultrasound. The $100,000 award will support clinical evaluation of “Wearable Low-Intensity Ultrasound Therapy”. Led by **George K. Lewis, Jr.**, a doctoral candidate in Biomedical Engineering, the team’s hypothesis is that this wearable technology, which would deliver low-power ultrasound to promote pain relief and even healing, could be dispensed as a disposable device at the front lines of primary care, where diagnosis warrants.

The $50,000 third prize is awarded to "Cardiocam: Technology for Non-Contact Multi-Parameter Physiologic Measurements". Led by **Ming-Zher Poh**, a MIT-HST doctoral candidate in the Media Lab, this project has pilot data showing that they can capture some physiologic data purely by image analysis over the internet from a web-cam looking at a patient’s face. Already, the team has captured heart-rate with great accuracy, during ordinary video-conferencing remote interactions. Respiratory rate and blood oxygenation are their next two goals. This approach correlates well with the evolving paradigm of offering more primary care through outreach and by delivering care at the right time, in the right place and if possible, without requiring office visits.
2009 Winners:

The $150,000 First Prize has been awarded to John Moore for the project entitled CollaboRhythm: Primary Care Teamwork Anywhere at Any Time. Mr. Moore is pursuing his PhD at MIT in the Media Lab. The goal of his work is to design, implement and test a technology platform that will enable better remote collaboration between patient and caregiver in a more advanced manner than possible with today's online and video-conferencing technologies. The core of the project is a personally-controlled health record, so that patients can have all needed information available anywhere, anytime. Novel human interfaces at both the patient side and caregiver side of interactions can potentially support a model of primary care that extends far beyond what is possible with just traditional office visits and phone or email contacts.

Second Prize and $100,000 has been awarded to Matthew Connor, for the project entitled iAbetics Web 2.0 Diabetes Management System. Mr. Connor is an undergraduate student in Engineering and Applied Sciences at Princeton University. This project addresses a long-standing problem of enhancing compliance and record-keeping for diabetics, in managing their chronic disease with diet and medication. The system includes education, compliance, data collection and a toolkit for research. By considering life-style factors in its design, iAbetics is positioning itself for the patient as a consumer, and seeks easy distribution via existing technology platforms.

Two projects tie for Third Prize and will split its $50,000 award. Richard Henrikson, a graduate student in Bioengineering at the University of Berkeley and his team will receive $25,000 in recognition for their work on developing a diagnostic device for detecting signature molecules in biologic fluids such as saliva. While there are many related projects in the field of microfluidic devices, the Aptazine-Mediated Signal Transduction technique was considered to have unique potential for significant impact. If successful, it could lead to a low-cost, disposable, point-of-care device for use in venues ranging from primary-care offices to field clinics in under-resourced and under-served regions of the world.

Ming Jack Po, a graduate student in Biomedical Engineering in Columbia University, shared the Third Prize and also receive $25,000 for his team’s project: Developing and Testing a Novel Therapeutic Game for Children with Autism Spectrum Disorder. Rehabilitation and cognitive therapies are growing fields in gaming, and this project was recognized for its sophisticated approach to incorporating critical human elements of engagement in its design. It is focused on a group of disorders that are increasingly outstripping the capabilities of specialists and therapists to adequately respond and treat. This technology could be used at home or in other settings as well. When customized by the therapist to the patient’s specific needs and responses, this therapeutic game has the potential to leverage the health professional’s time and resources in a patient-centric way by affording greater functionality and quality of life, thereby reducing the emotional and financial burden on families as well as on the resources of the healthcare system, and the difficulties that primary care providers face in identifying suitable resources for this growing population of patients.

The Ten Finalists for 2009:
Brant Chee, University of Illinois at Urbana-Champaign
Title: “Automation extraction of drug regimens and outcomes from health messages.”

Winnie Cheng, Massachusetts Institute of Technology
Title: “My medical elephant; Improving medical history reliability.”

Matthew Connor, Princeton University
Title: “iAbetics Web 2.0 diabetes management system.”

Sanna Gaspard, Carnegie Mellon University
Title: “Development of a diagnostic instrument for early-stage pressure ulcers (bed sores).”

Richard Henrikson, University of California, Berkeley
Title: “Versatile, rapid and inexpensive molecular detection through modular aptazyme-mediated signal transduction in a microfluidic device.”

Sarah Jeffords, Texas A & M University
Title: “Digital camera-coupled ophthalmoscope.”

Erez Lieberman, Harvard-MIT Health Sciences and Technology program
Title: “iShoe Insole.”

John Moore, MIT
Title: “Collaborative Technology for Primary Care: Teamwork anywhere at any time.”

Ming Jack Po, Columbia University
Title: “Therapeutic gaming for autistic children.”

Kurt Qing, Northwestern University
Title: “KMC ApneAlert.”