# Table of Contents

Introduction ........................................................................................................................................... 1
What is Bench to Bedside (B2B).................................................................................................................. 2
  2011 Results ............................................................................................................................................ 2
What are Students Saying? .......................................................................................................................... 3
  2011- 2012 Demographics ...................................................................................................................... 3
  B2B Staff and Sponsors .............................................................................................................................. 5
  Team Projects ........................................................................................................................................ 6
    LIYEN Inhaler - (Last Inhaler You’ll Ever Need) .................................................................................. 7
    Smart Ox ............................................................................................................................................. 8
    Advance Cath ...................................................................................................................................... 8
    Real Time INR .................................................................................................................................... 10
    FIT Catheter ....................................................................................................................................... 11
    Foley Safe ......................................................................................................................................... 12
    Hands Free Wheelchair ....................................................................................................................... 13
    HINS Laser Light Catheter ................................................................................................................... 14
    Cervical Tenaculum ............................................................................................................................. 16
    UCOMM ............................................................................................................................................ 17
    Infant Surgical Warming Mat ................................................................................................................ 18
    Precise Cut ......................................................................................................................................... 19
Final Ceremony Awards .............................................................................................................................. 20
Media/Press ............................................................................................................................................. 23
References .............................................................................................................................................. 28
Dear Colleagues,

Thanks to a group of bright, enthusiastic and talented students, the University of Utah is quickly becoming the envy of our peers across the nation. That’s what I realized after attending the Second Annual Bench2Bedside Competition, a program founded and run by students from three University colleges: medicine, engineering, and business. In the past two years, the competition has engaged 135 students who have worked together on 27 teams to create 28 new innovative medical devices.

This exceptional collaboration among our students has clearly resonated with our faculty—more than 100 of whom volunteered to be faculty mentors. These students have tapped into something at the University of Utah we need to keep fostering: thinking outside the box, working together, and coming up with brilliant solutions.

I want to express my sincere thanks to USTAR and Zions Bank for their generous and important support of the competition. Scott Anderson’s surprise announcement of $150,000 in support from Zions Bank for next year’s competition was welcome news. We believe investing today in the leaders, innovators, and entrepreneurs of tomorrow is a roadmap for Utah’s future success.

Finally, I want to thank Matthew W. Sorensen for his student leadership of this program over the past two years. In collaboration with faculty mentor John Langell, M.D., assistant professor of surgery and director of the University’s new Center for Medical Innovation, Matthew has clearly shown that when we give students the opportunity to run with new ideas, the results can be remarkable.

These talented students will transform science and medicine in ways we never thought possible. I’m looking forward to seeing what they come up with at next year’s competition and hope you’ll join me there.

Sincerely,

Vivian S. Lee, M.D.,
Ph.D., M.B.A.
Senior Vice President for Health Sciences
CEO, University of Utah Health Care
Dean, University of Utah School of Medicine
What is Bench to Bedside (B2B)

The purpose of the device design competition is to create an environment where young professionals in medicine, bioengineering, and business can learn to work together in a team dynamic and begin to learn the skills required to design, develop and commercialize new medical technology. Students learn innovation and entrepreneurship at the U by getting their hands dirty, by doing real work that helps real people and this sets us apart.

This organization is student run and provides medical, engineering, and business students an opportunity to compete to solve medical problems by developing new medical devices.

Teams are given 6 months and $500 to do the following:

- Identify a Clinical Problem
- Solve the Problem
- Design/Prototype
- Preliminary Patent
- Poster Presentation
- Investor Pitch
- Patent (after competition)
- Commercialize (after competition)

Students choose to complete these projects in teams purely as an extracurricular activity to build upon their learning process for device development.

2011 Results
In 2011 the following were a direct result from this program:

- 13 Student Teams
- 12 Provisional Patents Filed
- $70,000 awarded in Prize Money
- 4 LLC’s Started
- 1 team to Launch in Mongolia within the year
What are Students Saying?

“Everything from the hands on learning experience, to the vast amount of resources offered, the B2B program has helped me turn a dream into a reality.”
– Chris (MBA)

“I love that B2B gives the student the opportunity to do what they want. Students aren’t GIVEN a project. They make it their own.”
– Luna (Jr BME)

“When I heard about B2B from Bob Chestnut, I knew I was interested in global health and I had lots of ideas, but B2B helped me learn how to put those ideas to use.”
– Jessica (MSI)

“B2B has taught me how to take an integrative team approach to solving problems.”
– Greg (MBA)

“My involvement in B2B has taught me about business and how to take a concept, turn it into a prototype, and ultimately pitch it to investors.”
– Nate (Soph BME)

“B2B has helped me understand what a patent is and how to develop them along with how to develop a good business model.”
– Aaron (Soph MSE)

“After competing last year, I came back to B2B a second time because it sparks creativity with a new group of individuals with new rules to play by.”
– Tim (MBA)

“After competing last year, I came back to B2B a second time because it sparks creativity with a new group of individuals with new rules to play by.”
– Tim (MBA)
2011-2012 Demographics

Total Number of Participating Students - 2012

- Medical Students, 23
- Engineering Students, 22
- Business Students, 12

Total Number of Participating Students by Team - 2012

Engineering Students
Business Students
Medical Students

(Bar chart showing participation by team for various items such as Infant Surgical Warming, Precise Cut, etc.)
B2B Staff and Sponsors

(Left to Right) Bob Chestnut (B2B VP), Taylor Bench (Director StaC), Scott Anderson (CEO Zions Bank - Sponsor), Matt Sorensen (B2B President)

Ted McAleer (Executive Director USTAR – Sponsor)

Other B2B Staff Members:
Matt Sorensen (President), Bob Chestnut (Vice President), Joe Strunk (MSII Class Chair), Grant Sun (MSI Class Chair), Swati Rao (MSI Class Chair), Patrick Loftus (Engineering Chair), Asrash Pousaid (Engineering Chair), Dane Timmons (MBA Chair)

Sponsors

Zions Bank

In 2 years Sponsors:
Contributed $140,000 in award money
Impacted over 135 students
United 3 of the University of Utah colleges
Helped 27 student teams compete to create 28 innovated devices
Empowering students to innovate solutions to clinical problems
Team Projects
LIYEN Inhaler - (Last Inhaler You’ll Ever Need)

Jamal Abdinor (Leader)
Camilo Corredor (Leader)
Jackson Murphy
Chris Ciancone

Project Summary

Our device is so important because it has the capacity to revolutionize the archaic and monotonous inhaler industry. The LIYEN will not only encompass superior delivery of albuterol to the lungs compared to current pMDI inhalers, but will also redefine the user interaction and relationship an asthmatic has with their inhaler. The LIYEN will instill within the Asthmatic feelings of appreciation, pride, and positive emotional connection. With the LIYEN’s superior drug deliver and stylish modern look, we will feel empowered, capable, and optimistic with our conditions to really LIVE life with no restraints.

We have created a novel inhaler device that can deliver 70-90% of albuterol medication to the lungs through our patent pending delivery process. With current pMDI inhalers, you only receive around 20% of the medication in your lungs if done with proper user technique, which is the overarching problem with current inhalers. Not only does our product look and feel significantly better than the current inhaler, but it also eliminates the most common problem of user error.
Project Summary

The pulse oximeter is a widely used piece of technology that has been around since the early 1980’s. This device estimates arterial oxygen saturation, continuously if necessary, along with heart rate and it is used in multiple healthcare settings. In the field of pediatrics, this simple device has become instrumental in caring for infants and children with various cardio-pulmonary diseases. Although it is a commonly used device, many issues exist with its efficiency and effectiveness. Pediatric pulse oximeters are usually very small and incorporated into a wrap that may fit around the foot or finger of the young patient. Issues commonly observed with these current models include: high percentage of clinically unimportant and false alarms largely due to movement artifact, burns associated with heated transcutaneous electrodes, detachment of the device or tripping due to long cords, and finally lack of output data personalization with regard to altitude, skin pigmentation, and age. To address these issues, a novel pulse oximetry device, the SMART-OX, has been proposed. This device makes use of redundancy to improve efficacy as well as minimize risk of burns. The SMART-OX system consists of a wireless; multiple probe system communicating with a novel data processing package controlled using a user-friendly computer interface. Multiple probes provide a feedback system to reduce the number of false alarms, improve accuracy, while reducing burn risk because one probe is not continuously shining light on the patient’s skin. SMART-OX will not only benefit the patient, but also reduce costs for hospitals and clinics. It is estimated every minute reduction of wasted staff time spent checking a current pulse oximeter alarm equals $1.8 billion in savings nationally. This novel integrated pulse oximetry system will be an integral piece of technology in improved pediatric care.
Advance Cath

Ryan O'Callaghan (Leader)
Garret Coman (Leader)
Nick Blickenstaff

Project Summary

AdvanceCath is a urinary catheter intended for patients requiring indwelling catheterization for longer than one day due to bladder dysfunction, urinary incontinence, urinary retention, or paralysis. There is a very high risk of urinary tract infection (UTI) associated with indwelling urinary catheterization, with over 1 million annual cases in the US alone, adding approximately $850 million to the cost of care. We believe our device will significantly reduce the risk of UTI by addressing the primary mechanism with which bacteria enter the urinary tract, through bacterial film formation on the external surface of the catheter. This is accomplished with a novel design that better utilizes the body's anatomy and natural method of flushing bacteria out of the urinary tract. In addition to decreased infection rates, AdvanceCath provides superior comfort and a more discrete appearance than the Foley catheter. We have received very positive feedback from multiple physicians, validating AdvanceCath as a high potential, feasible solution for a true healthcare need.
Project Summary

Coumadin is the drug of choice for persons on anti-coagulation therapy. However, this drug has a very narrow therapeutic window that requires frequent visits to the physician for monitoring of the International Normalized Ratio (INR). Patients who find these recurrent visits inconvenient have created an emerging market with their desire to test their INR using readily-available home testing kits. Using smartphone apps on the patient end and a secure web portal on the physician end, Real-time Informatics has developed a seamless process that delivers the patient’s home-acquired INR directly to their physicians desktop. Our process is patent-pending, and delivers patient data to physicians in real-time, a multi-fold improvement over the current standard which relies on phone communication and facsimile documents for data sharing. Real-time Informatics delivers health data in a secure way at the speed of the internet, which yields better patient outcomes while leveraging physician time.
FIT Catheter

Ahrash Poursaid (Leader)
Mitch Barneck (Leader)
Ryan Coil
Martin de la Presa
Adam Bracken
Nate Rhodes
James Allen

Project Summary

Fecal incontinence affects 18 - 33% of patients in critical care settings, 46% of patients in long term care facilities, and 44% of people in residential nursing homes. For these bed ridden patients, the current standard of care is the balloon rectal catheter, wherein a hollow balloon attached around the end of the catheter is inserted into the rectum. This allows the stool to drain down the middle of the balloon into the catheter. The design calls for the balloon to be inflated and rest on the rectal shelf of the patient to stay in place. There are various problems with this device, namely that it constantly falls out, leaks, and simply cannot be used for patients with poor rectal tone (the largest contributing factor to cases of fecal incontinence). Leakage of stool requires the time and cost washing of bed sheets, increases the risk of skin erosion by over 22 fold, and often results in infection.

The FIT catheter has three unique characteristics to combat these problems: The innovative balloon design significantly improves on the current available models by effectively preventing the leakage of fecal matter. The next two features combine to secure the catheter in place and provide a seal to protect against leakage. For patients with poor rectal tone, this solution will provide the needed strength to hold the catheter in place. The stool will flow into a collection bag positioned at the end of the catheter without leakage, mess, and risk to the patient.
Foley Safe

Heather Narciso (Leader)
Hanna Barrett Yates
Alex Hoang
Jessie Villardie
Scott Rafferty

Project Summary

FoleySafe has developed a novel tool that decreases the catheter-associated urinary tract infection (CAUTI) rates associated with the use of Foley catheters. CAUTIs are the number one care-related infection in hospitals around the world, causing more than 13,000 deaths, and costing health care systems and patients billions of dollars every year.

The FoleySafe reduces CAUTI rates by preventing urinary reflux, and providing an innovative early detection system that indicates the presence of CAUTI-causing bacteria biofilms before complicated infection occurs.
Hands Free Wheelchair

Scott Lee (Leader)
Jessica Mayer (Leader)
Jerica Johnson
Luna Koizumi
Shaun Lauer
Matt Turner

Project Summary

Patients with several different kinds of neurological disorders, muscular dystrophy, and rheumatoid arthritis may present with ataxia and lack of fine motor control. These conditions can cause problems for patients who use joystick-controlled power wheelchairs. Patients who have decreased control of normal power wheelchairs are more at risk for injury. They may also experience decreased independence and may have issues in performing normal activities of daily living.

Our solution to this problem is a device that utilizes the patient’s proximal gross motor control to maneuver a joystick on a power wheelchair. Gross motor control of a wheelchair improves maneuverability and quality of life of patients with ataxia or decreased fine motor control. Our device attaches the patient’s forearm to the wheelchair armrest with a connection to the original wheelchair joystick. This allows the patient to operate the wheelchair using their arm muscles rather than their small finger and hand muscles. The device is completely mechanical and can easily replace the armrest of the wheelchair with a simple installation.

We plan on obtaining a patent and then going forward with the manufacturing process of this device. We will then market directly to hospitals and healthcare facilities.
HINS Laser Light Catheter

Ahrash Poursaid (Leader)
Mitch Barneck (Leader)
Ryan Coil
Martin de la Presa
Adam Bracken
Nate Rhodes
James Allen
Shawn Moore

Project Summary

There are approximately 5 million Central Venous Catheter lines placed annually in the United States. Despite technological advances there are 250,000 cases annually of Central Venous Catheter associated infections occur in the US. Approximately 12%-25% of Central Venous Catheter infections lead to mortality. In 2010 31,000 people died from CVC related blood stream infections. Our technology uses an innovative High intensity light to irradiate bacterial colonies which cause these infections. This technology has been shown to be up to 99.9% effective at inactivating bacterial growth, while being safe to use in humans. An estimated value of $6.25 billion is spent in the US to treat Catheter related blood stream infections. We hope that our device will save millions of lives and billions of dollars.
Smart Scope

Greg Sun (Leader)
Grant Sun (Leader)
Suzanne Wendelken

Project Summary

The smart scope is approximately 1/20th the cost of the Glidescope, our primary competitor. It also provides the features of any smartphone such as video conferencing, which can be advantageous in telemedicine and education applications. It is also portable using AA batteries and is unique in several ways.

Our product is the only video laryngoscope which utilizes ubiquitous smart phone technology paired with a conventional Macintosh laryngoscope blade and everyday optical scope. We incorporate existing and widely utilized technologies to reduce manufacturing costs and eliminate cumbersome bedside stands.

Future renditions of the scope will offer a sterile sleeve to cover the blade of the scope. This will have multiple advantages. First, it will offer sterility to each patient it is used on. The sleeve will also keep costs low for the department using the scope as well as creating a continuing revenue stream for Smart Scope.

Revenues for the company will be typical for a high growth market. Since the video laryngoscopy market is in its infantile stage, growth will be high in the first few years. We have nailed down costs of production to just over $100/unit and expect to sell each unit for $800 to $900 each. Additionally, sheaths will be around $2 each to manufacture and can be sold for the same margins as the scope.

Finally, through our research we found that the Smart Scope will fall under a class I device and will only
Cervical Tenaculum

Aaron Faulkner (Leader)
Angela VanAtta (Leader)
Alli Straubher
Shaun Hart
Michael Dowdle

Project Summary

This is a tenaculum-like device used to provide traction on the cervix during medical procedures. The device grips the cervix without piercing it, thus reducing or eliminating patient pain, discomfort and bleeding. This device allows for better visibility of the cervix. This device grips the cervix on the outer perimeter of the cervix as opposed to placing part of the device into the cervical allowing for easier passage of other devices into the uterus. The device hinges on a fulcrum placed outside of the body so the device will have less unintended points of contact and take up less room in the body. Typical tenaculums can only be used to grip the lateral portions of the cervix whereas this device can grip the posterior and anterior portion in addition to the lateral. This allows for greater adjustment capabilities for the patient anatomy.
Project Summary

Persons who have Laryngeal cancer and Parkinson’s disease often lose the ability to project their voice; this makes communication difficult, especially in public places with excessive ambient noise. Our goal is to help them communicate with their family and friends in these hard to communicate areas.

UComm addresses current amplifier needs using an in-mouth (attaches to teeth, like a retainer) high-quality microphone that is attached to a bluetooth transmitter (also in mouth). The microphone picks up voice and transmits the sound via bluetooth to an external device like a smart phone. The smart phone will serve as the amplifier, picking up the bluetooth and amplifying the sound. A person using our device would wear the UComm device on their back teeth, and simply activate their phone to enable amplification.

Current devices on the market are very noticeable and unattractive, causing discomfort for laryngectomy patients. These devices are out dated and do not take advantage of available technology. Our device will revolutionize the way that amplification is done, making it discrete, simple, and more convenient than ever before.
Project Summary

The product currently under development will be able to keep infants warm during surgical procedures to ensure fewer post-operation complications. We plan to use phase-change technology in order to create a warming blanket for infants undergoing surgical procedures.

The need for a simple and effective, affordable warming system for neonatal infants under anesthesia is widely prevalent. Our product works where current solutions do not since it does not require a constant input of energy to work, which is a prime product for any place with expensive or an unreliable power source. Some neonatal surgeries can last anywhere from four to six hours straight.

During this time under anesthesia, neonates are especially prone to anesthesia-induced hypothermia.

1) It works without any moving mechanical parts that are prone to mechanical failure.
2) It delivers a steady, uninterrupted flow of heat to the patient.
3) It is lightweight and easily transportable.
4) It is not resource heavy and can be manufactured anywhere in the world.
5) It can be sanitized in the field without autoclave.
6) It is simple to use and does not require more than a brief training on its use.
7) It is reusable
Precise Cut
Sourav Kole (Leader)
Tim Cosgrove
Madeline Torres
Daniel Betz

Project Summary

Removal of necrotic burden by surgical debridement is a key step in wound management. Devitalized/dead tissue and necrotic burden can be a breeding ground for bacteria and therefore prevents healing, and the concealed dead spaces may harbor bacteria that further cause tissue damage. Surgical debridement is a fast and effective method of removing devitalized tissue by limiting tissue destruction and wound contamination.

The current gold standard requires surgeon inspection of the affected area to inspect for any physical presentations of ischemic or necrotic tissue that involves discoloration, inflammation, and absence of a pulse. The surgeon must use his/her discretion to identify the necrotic borders and correctly remove all of the necrotic tissue.

Past researchers have showed a distinct correlation between bacteria burden present in a wound and the tissue pH level. Also, it is known that ischemia lowers the tissue pH. PreciseCut uses this to replace the current imprecise and subjective system of debridement into a disposable, rapid, accurate, and quantitative testing system that augments the visual determination of surgeons to precisely cut around necrotic tissue and create clean margins every time. PreciseCut, with the complementing aspects of surgical precision and risk-abatement, is a revolutionary idea for surgical debridement.
Final Ceremony Awards

This section will list the awards for the 2011-2012 year.

Friday April 6, 2012
6:00 PM
The Tower @ Rice Eccles Stadium
Final Ceremony Awards

This section contains the awards by team.

**Liyan Inhaler**
$15,000 - 1st Place
$5,000 - Best Business

**Smart Ox**
$10,000 - Runner up
$5,000 - Best Engineering

**Advance Cath**
$10,000 - Runner up

**Real Time INR**
$10,000 - Runner up
FIT Catheter
$5,000 - Best Medical
$1,000 - Best Visual Aids

Foley Safe
$3,000 - STAC Grant

Hands Free Wheelchair
$3,000 - STAC Grant

HINS Laser Light Catheter
$3,000 - STAC Grant
This section contains copies of news articles pertaining to this year’s events.

**The Salt Lake Tribune**

**Inhaler cleans up in University of Utah’s ‘bench to bedside’ contest Health**

Rick Egan | The Salt Lake Tribune Camilo Corredor, left, Chris Ciancone, Jamal Abdinor and Jackson Murphy, undergraduates at Westminster College and the University of Utah, won the U.’s Bench to Bedside Medical Device Competition grand prize with their idea for improving inhalers used by asthmatics. They hope to start a business to manufacture their device called LIYEN, or "last inhaler you'll ever need."

Team of undergraduates hatches idea to improve device used by millions of asthmatics.

By Brian Maffly

The Salt Lake Tribune

Published: April 26, 2012 06:35PM
Updated: April 26, 2012 06:36PM
Rick Egan | The Salt Lake Tribune Camilo Corredor, left, Chris Ciancone, Jamal Abdnor and Jackson Murphy, undergraduates at Westminster College and the University of Utah, won the U.’s Bench to Bedside Medical Device Competition grand prize with their idea for improving inhalers used by asthmatics. They hope to start a business to manufacture their device called LIYEN, or “last inhaler you’ll ever need.”

Asthma is no laughing matter, but Chris Ciancone thinks the inhalers he uses now to treat his lung disease are a joke.

The Westminster College business student, with the help of three University of Utah engineering students, turned that frustration into the winning entry for the U.’s Bench to Bedside Medical Device Competition earlier this month.

Inhalers haven’t advanced much in Ciancone’s lifetime despite their shortcomings, said the 24-year-old mountain climbing enthusiast from Layton. The devices are formally called pressurized metered dose inhalers, or pMDI, an acronym Ciancone came to loath during asthma attacks that leave him gasping for air.

“It looks like it came out of 1982 textbook,” Ciancone said. “It’s hard to use. You have to have perfect hand-breath coordination, and even if you get it right, you only get 20 percent of the medicine to the lungs. Not only does it look horrible, it doesn’t get the job done.”

Asthma is an acute inflammation of airways in the lungs that afflicts up to 10 million Americans. While recovering from sinus surgery last year, Ciancone became fixated on improving existing inhalers, which emit an aerosolized dose that needs to get into the airways to do any good.

Most of the drug just gets stuck in the mouth and throat, according to the team.

“You have a half-second window to get the inhalation right,” Ciancone said. “If you put this in the hands of a child or elderly person, they aren’t going to get the medicine in their lungs. It only leads to poor patient compliance and frustration.”

His team created a device they call LIYEN, an acronym for Last Inhaler You’ll Ever Need and pronounced like the lion Ciancone put on his business card. He and his teammates — Jamal Abdnor, Camilo Corredor, and Jackson Murphy — are starting a business to turn their idea into a product they say will improve the health of asthmatics and save them money.

“I’m excited to see what comes from his project,” said Matt Sorensen, a second-year U. medical student who organizes Bench to Bedside. “They found an interesting niche. It’s been a long time coming for something to change. It’s opened a window for a new market.”
Ciancone’s team claims LIYEN users will not have to worry about timing their inhalations, and that patients’ lungs will receive 70 to 90 percent of the drug used to control asthma. That drug commonly goes under the brand Albuterol.

Anxiety of unpredictable attacks prevents asthmatics from fully engaging life, according to Ciancone, whose own attacks are triggered by allergens.

“We feel our device will empower them to do what they dream to do. For me that’s climbing mountains,” Ciancone said. He hopes to personally demonstrate LIYEN’s efficacy on a climb up Tanzania’s Kilimanjaro, Africa’s highest peak at 19,341 feet.

The crew of undergraduates bested 13 other Bench to Bedside teams, mostly led by U. graduate and medical students, to claim the $15,000 grand prize, plus the $5,000 prize for best business plan. They were also angling for the $1,000 prize for most creative poster.

“We lost to a rectal catheter,” Murphy said.

Murphy, a bioengineering major, and Ciancone entered the inaugural Bench to Beside last year with U. medical students, presenting an idea for surgical markers. This year, they hooked up with Coredor and Abdinor, chemical engineering majors who graduated from the U.-affiliated high school called AMES, or Academy of Math, Science and Engineering.

They kicked around ideas for improving portable dialysis machines, tattoos that measure glucose levels and multi-cartridge syringes, before settling on the inhaler, which are used by millions of people and have seen little innovation.

“The drug companies are making plenty of money so they are content with the way things are,” Murphy said.

Ciancone, who graduates this spring, is considering graduate school at the U. to study in the Lassonde entrepreneur program. But he and the LIYEN team are devoting the next year developing a prototype and securing patents and FDA clearance.

bmaffly@sltrib.com

—

Bench to Bedside

The University of Utah last year launched this challenge to students to develop commercially viable improvements to medical devices. To see all the winners, visit www.sltrib.com/Money.

© 2012 The Salt Lake Tribune
Westminster Student Designs Award-Winning Medical Device

Press Release

May 1, 2012

Westminster marketing student, Chris Ciancone, has always dreamed of climbing Mount Kilimanjaro, but asthma has kept the 24 year old from seriously considering the nearly 20,000-foot ascent—until now. Ciancone and his teammates from the University of Utah recently took top honors in the University of Utah’s Bench to Bedside Medical Device Competition winning the grand prize for “Best Overall Device,” as well as “Best Business.” The team designed a novel inhaler device, called LIYEN, that improves delivery of albuterol to the lungs of asthma patients.

Ciancone conceived of the life-saving idea while hospitalized for sinus surgery. As an asthmatic, Ciancone never goes anywhere without an inhaler.

“It was always so embarrassing to pull out my inhaler when I was kid,” recalled Ciancone. “I want asthmatics to have something that empowers them to accomplish their goals, not hide.”

Ciancone teamed up with three engineering students from the University of Utah, Jamal Abdinor, Camilo Corredor, and Jackson Murphy, to create a prototype of the LIYEN inhaler. LIYEN is an acronym for the “last inhaler you’ll ever need.” LIYEN is designed for 70-90 percent lung deposition of Albuterol compared to the current pMDI inhaler that has only 20 percent lung deposition.

“Eight million asthma patients in the U.S. use a standard inhaler and many don’t even get 20 percent of the medicine because they mess up the hand-breath coordination required to deliver it,” said Ciancone. “The LIYEN’s patent pending technology eliminates most user error.”

Ciancone’s team competed against 13 other teams during the 2012 Bench to Bedside Medical Device Competition hosted by the Technology Venture Development at the University of Utah. Students from the U of U’s medical school, college of engineering and school of business participated in the competition that focuses on teaching bioengineering and business to learn to work together. Ciancone combined his business model, market research, and presentation skills with the science knowledge of his teammates to create the competition’s winning device.

“This is a key example of how important it is to add business skills into the equation of commercializing any innovative product,” said Linda Muir, director of the Institute for New Enterprise at Westminster. “We’re so proud to support and encourage the entrepreneurial spirit of students like Chris.”
Ciancone will use the entrepreneurial skills he gained at Westminster to make LIYEN commercially available to asthma patients. The Technology Venture Development Office at the University of Utah will provide resources to Ciancone’s team to help facilitate intellectual property rights and licensing options for the new medical device.

“Chris has been involved in the Bench to Bedside competition both years, and has really put in a lot of effort to making his team successful,” added Matt Sorensen, Bench to Bedside president. “I’m excited to see what comes from his project.”

Ciancone, who enjoys rock climbing, plans to focus his career on biomedical development and innovative outdoor products for asthmatics to use at high altitudes. With the LIYEN inhaler, Ciancone is one step closer to reaching the top of Kilimanjaro.

(5.1.12)
References

