



# DiaBeatIt Kit

Madeha Ahmed, Aniq Akther, Rubba Al-Kafaji, Kallet Burton,  
Alessandra Crabtree, Soraya Taylor



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

### Introduction

Diabetes has become a common disease for people of all ages. There are many types of diabetes; for example, Type I, Type II, and Gestational. Type I diabetes occurs when the insulin producing cells of the pancreas are damaged. Injecting insulin is the only way to keep glucose levels under control. Type II diabetes is when the pancreas produces insulin but not enough. It develops due to one's poor lifestyle, unlike Type I. To prevent further complications, you would need to watch your diet, exercise, and take oral pills. Gestational diabetes occurs during pregnancy due to hormonal changes at that time. In turn, it affects insulin, which raises glucose levels.

### Problem

There are a wide range of gadgets available to aid diabetics but many are either expensive or not easy to access from one provider. Using needles is a dominant method for checking glucose levels throughout the day. The issue is that many fear needles and it's a hassle to clean it constantly. Many are also embarrassed by the gadgets that are given to them and refuse to wear them outside

### Background

- Inexpensive for those with Medicaid.
- Five components in one.
- Customizable to your style and needs.
- A discrete product to make diabetes accustomed to one's lifestyle.
- Less stressful and painful for diabetics.

### Why

Our gadget is created to aid the needs of diabetics. They require stylish products that are both inexpensive and easy to access. We give them exactly that and rid them from the burden of checking glucose with needles.

## Project Description

### Five Components Of the Kit

#### Pamphlet

- Provides you with information on support groups and treatment options as a diabetic.
- Lays out some ways to cope with your emotions, specifically depression and anxiety.
- Makes ways to help you eat properly and most importantly be healthy.

#### Watch

- Any information related to the lens, foot pad, and tooth will be detected and the patient will be alerted.
- Customizable
- Instant results

#### Contact lens

- Has two sensors (one on top and one on the bottom) that tears can seep through and provide a glucose reading.
- The lens also has an antenna that can move around and take pictures of various parts of the eye to detect any abnormalities.
- The antenna will gather all the information and send it back to the watch.

#### Foot pad

- Relieve tingling
- Relieve pain
- Detect trauma
- Massage feet

#### Dental

- Monitors glucose levels
- Checks for any malformations in the mouth

## Expected Outcomes

- As complex as diabetes is, our product makes the treatment less complicated.
- Diabetics will not feel ashamed or embarrassed while dealing with diagnosis.
- Provides support and diabetic resources.
- Accommodates to diabetics of all ages.
- Build a partnership with Henry Ford and other non-profit organizations; such as American Diabetes Association, Children Diabetes, Diabetes Research Institute Foundation, and Joslin Diabetes Center.



# Smiles For Miles

Megan Nowak, Abtisam Hassan, Ariana Hall, Vernon Smith, Federick Johnson



## Introduction/Background/Why/Problem

### Diabetes affects many significant body systems, but it plays a significant role in oral health

- 371 million people worldwide are affected by diabetes, and according to the American Hygienist Association, one third of all diabetics will suffer from Periodontal Diseases.
  - Periodontal Diseases, like Periodontitis and Gingivitis, are infections that can cause the gums to be inflamed and bleed. In extreme cases, the gums can pull away from the tooth and cause bone loss in the jaw.
  - Diabetics are also 5 times more susceptible to other oral related infections such as thrush, ulcers and tooth decay, all of which are very harmful to the oral cavity.

- Some health professionals are unaware of the impact diabetes has on oral health, this especially applies to people in impoverished health care regions.
  - According to the World Health Organization, 1 in 9 people are diagnosed with diabetes and acquire oral associated infections.
  - The prevalence is related to the lack of available resources to treat and prevent infection.
  - The increased pervasiveness in the Middle East is also in part due to the lack of awareness by its people regarding oral preventative measures necessary when diagnosed with diabetes.

\*\*\*Currently there is a lack of insulin which is necessary for treatment. Without insulin blood sugar levels are not controlled and cause infection to flourish. Resources such as dentists and dental supplies are scarce or non-existent so diseases escalate.\*\*\*  
-World Health Organization

**Statistics suggest a significant need for oral health support for those afflicted by complications associated with diabetes, which has motivated the Smiles for Miles team to research, collaborate and create strategies that will make a positive difference. We have committed our efforts to establish a non profit organization focused on increasing diabetic dental care for those in need. Through missions trips to impoverished areas, we will improve quality access to dentists, medical professionals, social workers, and supplies, we will to reduce, prevent and treat oral diseases induced by diabetes.**

## Project Description

We are a global non profit organization that provides specialized diabetic dental care to impoverished regions, through mission trips. Our goal is to treat, reduce, and prevent oral diseases caused by diabetes.

### Syria

- The initial target area will be the geographic area of Syria. According to the World Health Organization, the prevalence of diabetes within this geographic region has almost tripled since 1980. Significant barriers to resources and services exist due to the economic and political conditions.
- Additional sites will be selected based on Periodontal disease and diabetes prevalence.

### Funding

- Funds for missions expenses will be generated through grants, sponsorships, and individual donations.
- Unique to this program, people with diabetes will have the opportunity to make a difference by purchasing an Oral Care Box through our website. All proceeds will be donated to Smiles for Miles.

### Smiles for Miles Diabetic Oral Care Box

When diabetic patients subscribe to Smiles for Miles Oral Care Box, they will receive a box containing three oral hygiene items.

- Our signature toothpaste infused with minerals and antibiotics to directly treat and help prevent periodontal diseases.
- A glycemic index increasing mint, *Boost Mints*, that aims to give diabetics who are feeling a bit drowsy a little boost of glucose.
- An "all access" card which will contain a link to our website where information and our mission trip vlog will be displayed. A toll free 24 hour 7 day hotline for diabetics to contact medical professionals regarding questions or concerns they may have.

### Dentists

- These same products will be used by the missionary dentists and hygienists in the afflicted countries.
- Missionary dentists and hygienists, with experience treating diabetic patients will be recruited from all over the world to participate in this global outreach.

## Expected Outcomes

### Goal

- Smiles for Miles strives to decrease high percentages of oral diseases by assisting developing countries with diabetes dental care.
- We hope to keep glucose levels under control and in return, have a result of healthy strong teeth, eyes, and kidneys.

### Support

- We aim to provide diabetics emotional and mental support via a hotline that will give them an opportunity to confide in someone about their troubles.
- Our objective is to help uninformed diabetics become more knowledgeable about their oral health by providing an opportunity to instamessage dentists, doctors, and nurses who volunteer to make a difference.
- Missionaries will invest their time, talent and treasure in underdeveloped countries, creating global awareness and social consciousness necessary to make a difference.

### Products

- The objective of the Boost Mints is to service diabetics by raising their glucose level. The Boost Mints will be an over the counter product, catered to the general public supplying them with fresh breathes.
- Our signature toothpaste is manufactured to help prevent diabetes and obesity.
- The toothpaste and Boost Mints will be advertised in commercial sites to benefit all consumers.



# Diabetes vs. Everybody

De'Kiya Mitchell , Randa Johnson , Danya Hill

Nicole Perry, Briajah Tucker



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

Students are ashamed about having diabetes and they're not opening up about it. Disadvantaged families are not educated enough about their overall health and diabetes. The problem is the government has failed in educating the urban, poverty stricken families. Unaffordable health has played a major role in most these issues.

## Project Description

The Live'n Go.....

The Live'n go consists of three Items, The Ear Buddy, The Candy Pen and an Informational Coloring Book for youth and adolescence.

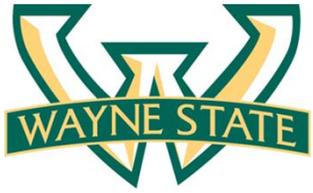
The Ear Buddy utilizes Bluetooth to connect to any smart device. The ear buddy will be set to remind the user when to take their insulin.

The Candy Pen shaped like a lollipop so it can replace the bland and boring insulin devices diabetics use now.

The coloring book will simply show simple illustrations of nurses and doctors administering insulin with helpful information to newly diagnosed patients.

## Expected Outcomes

Ensure that all adolescents are highly educated on insulin intake, the consequences of not taking the insulin, and overall balanced health.



# DiaFit

Kayla Harris, An'Drese Hopkins, Isis Madyun, Anish Nimmagadda, Elizabeth Vaillencourt



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

- Diabetes is the seventh leading cause of death in the United States.
- It has affected 25.8 million people of the U.S. population.
- Every place in the body needs glucose, which is also known as sugar.
- But, when glucose levels rise high, it cannot get into the cells without insulin.
- If glucose cannot get into the cells, then cells won't get the energy needed.
- By exercising, the glucose level in the person with diabetes blood can be reduced.

## Project Description

- It is a wristband with a moisture sensor attached to it.
- A moisture sensor checks blood glucose levels with no pain.
- The blood glucose moisture sensor is vastly less painful than the normal sensor with a silicone microneedle, making it optimal for use at anytime.
- Velcro will be used to connect the moisture sensor to the wristband.
- The velcro is detachable, so the sensor is portable.

## Expected Outcomes

- For people to feel more comfortable while exercising.
- More convenient product, with easy access.
- Awareness of body needs.
- Encourages people with diabetes to exercise.
- Effectively checks glucose levels.
- Affordable.
- Keeps people less at risk for hyperglycemia or hypoglycemia.
- No transportation needed.
- Low cost.
- Comfortable around peers.



# The Diabetic Test

Moses Reed, Diane Player, Taylen Mention,  
Jasmine Mathis, Hovhannes Koehler



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

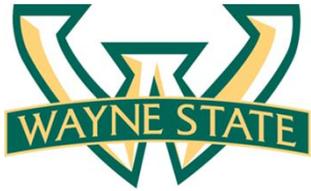
In numerous cases Diabetes is treatable with no side affects, but far too many people do not find treatments nor diagnose the disease until symptoms form which can be harder to treat, and life threatening. If we can have more people know they had diabetes, treatment plans would work better to help keep patients healthy, our goal will be met.

## Project Description

Our device, The Diabetic Test, uses a blood sample from the patient and the chemical Hemoglobin A1C test to accurately determine the buildup of Glucose in the body, and in turn accurately find Diabetes in a tested patient. The test is done inside the handheld testing device which gives a glucose reading with data from two-three months prior.

## Expected Outcomes

If a product like this was made it would be more accessible to more people, and able to help diagnose diabetes sooner with more accuracy. This would allow for a higher number of diabetic patients to be discovered each year, and individual treatment plans to be prescribed sooner for a healthier diabetic population overall.



# Master Minds

Sonya Liggins, Cierra Price, Aaron Rainey, Caira Walker, LeeAnn Wilson



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

What is Diabetes?

-Diabetes is the amount of insulin produced by the body is inconsistent.

- Having too much glucose can cause damage to the eyes, kidneys, nerves, and can lead to heart disease and the removal of a limb.

Causes

-The main cause if unknown but some factors that are involved are:

- Family history- Type 1 and Type 2

-Pregnancy- Gestational

-Obesity- Type 2

-Climate-Type1

Physical inactivity- Type 2

Types:Types 1: Insulin dependent ( your pancreas does not produce any insulin at all )

Type 2: Oral or injectable insulin( your pancreas produces insulin but not enough)

Gestational: Develops during pregnancy ( caused by an increase of hormones that less ables the body to use insulin).

Surgical- Surgery on pancreas may cause organ dysfunction.

Chemical- Steroids, may cause an increase in blood sugar levels.

Statistics:

25.8 million people are affected

11.8 % of male and 10.8% of women are affected

76,488 deaths were caused by diabetes in the year 2015

Ranked 7th for the cause of death

8.3% of the U.S population has diabetes

193,000 Americans under the age of 20 are estimated to have diabetes

## Project Description

Product-

We created them because everyone of us knows someone that struggles with diabetes.

Technology:

Uses your sweat that is created from your skin to help determine your glucose levels.

Has a little chip inside that vibrates when your sugar is either too high or too low, if you do not react with 2-3 minutes then the chip will sound an alarm until you react.

The chip has a little battery that lasts for 6 months, and at the end of the 6 months then you would come into the store for a 5 minute visit for us to change your battery for \$10.00.

Some features included:

-Water proof

-Affordable

- Fashionable( One size fits all and they come in all different colors and designs. They can also be custom made))

-Physical activity friendly and very comfortable

## Expected Outcomes

Expected Outcomes:

-We want people to feel comfortable with the fact that they have diabetes and to make them not feel embarrassed.

-To help people, before it gets to late and basically save lives.

-Make them self aware about their blood sugars, and see what triggers there sugar to either get too low or too high.



# Being Mindful of Your Diabetes

Joshua O'Bannon-Liggins, Caliah Wilder, Kiana Weems, Raegan Singleton, Alexis Thompson



## Introduction/Background/Why/Problem

Diabetes is recognized as one of the top 10 causes of death in the U.S., causing stress to the diabetic and family members involved

### Background of Diabetes

- ▶ Type 1 – Condition in which the pancreas produces little to no insulin
- ▶ Type 2 – Condition in which the pancreas does not produce enough insulin to keep blood sugar normal
- ▶ Symptoms – Weakness and fatigue, numbness in extremities. Extreme complications include loss of teeth and sight, amputation, and coma.

## Project Description

### The SmartPatch

Wearable and removable waterproof patch containing a chip with personal data about your Type 1 or Type 2 Diabetes. It communicates with smart devices like iPhones and smartwatches with the download of the SmartPatch app.

### Features

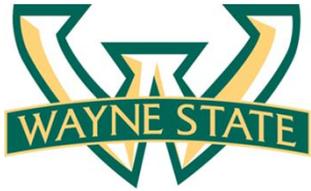
- ▶ Includes 10 adhesive patches, each wearable up to 5 days at a time
- ▶ Notifies device how to raise or lower your blood glucose levels.
- ▶ Constant, accurate monitoring of blood glucose levels
- ▶ More convenient and less painful than a test strip
- ▶ Alerts the nearest hospital or physician in case of emergency
- ▶ Contains a Bluetooth accessible device if not using other smart devices
- ▶ Covered by insurance

## Expected Outcomes

- ▶ The **SmartPatch** allows you to know at ALL TIMES what your diabetic levels are.
- ▶ Lower risks of extreme diabetic outcomes
- ▶ Can be prescribed by physician or purchased at any pharmacy retail locations
- ▶ Relieves stress from you and your family members
- ▶ Avoid periodontal disease
- ▶ Risks – Sensitivity and allergic reaction to skin

### References

cdc.gov  
diabetes.org – American Diabetes Association  
webmd.com/diabetes



# The Ring Effect

La’Nasia Nelson, Andrew Rainey, Jada Raymore,  
Micaiah Webb, Malik Whitehead



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

### Introduction

Our group was able to produce a plan for an invention that will be engineered to be programmed to essentially be controlled with a Micro controller using Arduino software. Our group was able to come together, and generate an invention that has the ability and potential to change the appearance of diabetes to the general public, as well as utilize new and upcoming technology created to help people who suffer from diabetes as a whole.

### Background

Did you know that diabetes is the 7th leading cause of death in the United States? In 2015, there were 79,535 casualties due to diabetic complications. There is an estimated 29 million people in the US suffering with diabetes. Type 1 diabetes is when the pancreas cannot create insulin and type 2 diabetes is when the pancreas does make insulin but it does not work in the body like it should.

### WHY

Diabetics are constantly looking for easier ways to track blood glucose levels. With our product, The Ring Effect, users can easily track blood sugar. It's easy to manage, it's comfortable, recommends healthy foods, and it is less to carry. It comes in many different colors and styles for both kids and adults, and it is also modern and affordable. The Ring Effect is suitable for all ages, waterproof, and can be worn throughout the day.

## Project Description

There is a new developing solution; The Ring Effect. This ring is lined with microscopic needles that will continuously measure the blood glucose levels within your bloodstream. The measurements will be shown digitally on a display across the top of the ring. The Ring Effect will not only show the numbers, but it will also notify consumers when the levels are getting into dangerous zones. This ring will vibrate when the user is experiencing hypoglycemia and hyperglycemia. When experience hyperglycemia ring will automatically inject insulin stored in a replaceable capsule. The amount of insulin in a capsule is prescribed by the user's doctor and will need to be replaced daily. In addition to automatically injecting insulin The Ring Effect will also bluetooth all the information to a paired application that can be accessed on smart-devices. This application will store all data collected by The Ring Effect, which will help users analyze previous behavior, as well as include guides and meal suggestions to plan for better diabetes management. Each ring will be programmed through the application by the users doctor; this will ensure the correct dosage and measurements are made precisely.

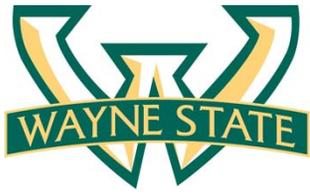


## Expected Outcomes

As a result of the Ring Effect consumers will find this product convenient and easier to manage diabetes because they won't forget to keep track of their of their glucose level. This is especially true for kids and elderly adults. The reason it's more beneficial is because it is more private, it does not take time out of your day, it is painless, and less work than having to inject yourself with insulin.

- More comfortable
- Less embarrassment
- Happier life
- More convenient
- Painless





# Ambition Girls Inc. Presents: THE BETA BRUSH!



C<sup>2</sup> Pipeline

Chinemerem N, Demesha P, Bre'Asia Y, Carlynn Y

## Introduction/Background/Why/Problem

86 million people in the United States have prediabetes. 9/10 of us **aren't aware of it**. This is a problem because awareness is not being raised soon enough allowing pre-diabetics won't show symptoms and will not make proper lifestyle changes to lower the risks of becoming a type two diabetics. We are targeting pre-diabetics, ages 5-17 because they are the **largest** group at risk.



## Project Description

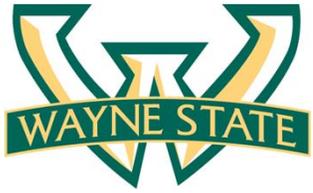
The Beta Brush is a toothbrush that **collects glucose levels using saliva**. The tooth brush will send your results directly to a family physician. The Beta Paste, which is a toothpaste that will accompany our product, is a sugar-free paste that will aid the reduction of glucose. The brush will also **include positive messages** after each test encouraging each patient to keep track of their lifestyle and make healthier choices. These messages are just the motivation each patient needs!

dreamstime.com

## Expected Outcomes

The Beta Brush will **assist in raising awareness** in youth especially. By uploading **real-time** information to your physician, your doctor will be much better prepared to care for their patients and will have less trouble keeping up with certain habits that you have made. Our product will assist in **lowering** blood glucose. It will become a much **less painful** method in testing sugar levels and is also fun to use. Since the brush sends positive messages after each test, it will help encourage the patient and lower the rate of patients who feel embarrassed about the disease.

You  
Rock!



# Title: 6D-Tee

**Authors: Samantha E., Denisha B., Maya C., Tyrek B., Makyla W,, and Makiya E.**



**C<sup>2</sup> Pipeline**

## Introduction/Background/Why/Problem

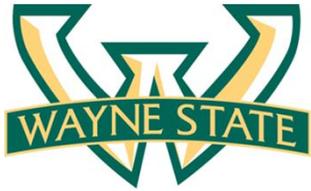
The 6D-Tee is a diabetic T-shirt that releases insulin which absorbs into skin. People with diabetes have to inject themselves with needles which causes pain and discomfort. Kids and the elderly sometimes forget to take insulin, so we came up with a painless alternative to injecting insulin.

## Project Description

The Diabetic T-shirt is a piece of clothing that enables you to inject insulin through the shirt, so the insulin can absorb through your skin. The shirt replaces insulin shots, making it great for the kids and the elderly. There will be a days supply of insulin in the vials attached to a rectangular pallet by a magnet, which can clip onto any type of pants or skirt. The days supply of insulin will automatically go through tubes that are throughout the shirt, connected to it is a super absorbent layer of polymer that can absorb moisture that's twice it's own weight (maybe more). The insulin is automatically able to shoot up through a controller for the pump, that also tells it when to turn on and off, and how much insulin to dispense. Similar to setting an alarm clock on a smartphone. We can accomplish this with a programming language such as C++.

## Expected Outcomes

The expected outcome of 6D-Tee, the diabetic t-shirt, is a pain-free experience for diabetics of all ages. It means not having to use a needle to provide their medication and they can have a better quality of life. Children would especially benefit from this; they could discreetly take their medicine without being bullied for being different.



# Drug Delivery Wireless System

Hieu Bui, Gabe Cretcher, Aarian Driskell, David King,  
Breonna Luster, Sumer Tuayma



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

An estimated 29 million Americans have diabetes and unfortunately, one fourth of them are unaware (*Diabetes Latest*, CDC.gov, 2014). On average, by the time someone is diagnosed with Type 2 diabetes, the disease has been present for about 4 to 7 years (*Diabetes Is the leading Cause of Chronic Kidney Disease*, Davita, 2017).

Diabetes is the leading cause of blindness in working-aged adults (*Ten Things You*, joslin.org, 2017). Some other symptoms of diabetes include: frequent urination, excessive thirst, unusual weight loss, blurry vision, and extreme hunger. Although these symptoms might occur, they are not as severe with someone who has Type 2 diabetes. That is why it's often undiagnosed for many years (*Diabetes Is the leading Cause of Chronic Kidney Disease*, Davita, 2017).

The global cost of diabetes per year is 825 billion (*Cost of Diabetes*, Harvard.edu, 2016). With new technology, such as the Drug Delivery Wireless System or D2 Wireless System, this number can be reduced greatly.

## Project Description

Our product, the Drug Delivery Wireless System, is an implantable microchip that connects to an easily accessible mobile app. The microchip can be inserted into various spots in your body, such as your forearm or thighs. The chip can monitor your glucose levels, blood pressure, cholesterol, as well as many other vitals that are important for diabetes patients to keep track of. The information collected by the microchip can be wirelessly sent to the app and can be accessed by your doctor. When the microchip senses something is wrong with your vitals, it can send emergency alerts to your phone.

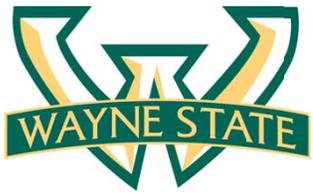
Apart from monitoring your vitals, the D2 Wireless System acts as an artificial gland that is able to release insulin in a patient's body when needed. This is very important because insulin is a hormone made by the pancreas that allows your blood sugar levels to stabilize (Hess-Fischl, *What is Insulin*, 2017).

The app allows patients to request medical data from their doctor, as well as tracking your nutritional goals and giving you a personalized diabetes management plan. Included in the app is a 24-hour consultant to answer any questions the patient may have in regards to their medical needs.

## Expected Outcomes

Because the Drug Delivery Wireless System microchip releases insulin directly into your system, it eliminates the need to self-inject insulin making it a very effortless and painless way to stay healthy. It is also inexpensive compared to other methods. For example, insulin pumps cost anywhere between \$4,500 and 6,500 (*Insulin Pump Cost*, Costhelper.com, 2015). Health insurance may be able to cover some of the cost of the D2 Wireless System, however the system is affordable without health insurance. The projected cost for the microchip is \$24.99.

Initially the microchip will not be available worldwide. For initial testing, a pilot program will be established in the Detroit and Metro-Detroit area. After the testing phase and collecting data from all the patients, the microchip will be available globally. With the D2 Wireless System, we hope to help diabetic patients enjoy a better quality of life, and make the complications that come with medication delivery for diabetic patients non-existent.



# Forever Fresh Express



C<sup>2</sup> Pipeline

Julia D'Arca, Essence Eckford, Emoni Fitzgerald,  
Nina Flowers, Ahmad Graham, Briana Martin

## Introduction/Background/Why/Problem

- We are Forever Fresh Express, And we bring freshness to you....**FOREVER!**
- \$50,000 to start our business. By donations, and loans.
- Connecting with the National Diabetes Prevention Program.
- There isn't a lot of healthy choices around the Detroit area.
- To help the prevention of diabetes, and to help diabetics less dependent on insulin.



unite for diabetes



## Project Description

- Healthy food truck.
- Provides smoothies, sandwiches, and our special salad.
- Very affordable.
- Online express delivery.
- We park at different locations to serve also.
- We have a point system, which gives free gifts after a certain time of purchasing on our food truck.

### HEALTHY SMOOTHIES

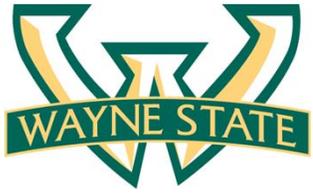


## Expected Outcomes

- Decrease the percentage of type 2 diabetes.
- To have diabetics less dependent on insulin.
- To promote healthy lifestyles in the community..



© 2013 How to Give Insulin Shots



# D1 Kit

Axel Esbri-Colon, Ariel Gordon, Sophia Guerrero, Mayet Madyun, Jessica Michalec and Clinton Pruitt



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

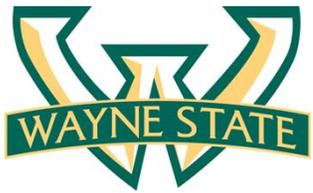
Did you know that every 10secs someone in the world is diagnosed with diabetes, and every 10secs someone in the world dies because of diabetes. That's why we made the D1 kit or the diabetes kit (we named it D1 because its 1 of a kind). The problem that every diabetic has is that you have to take blood every day to check your sugar levels. With our kit all you need is a little bit of saliva because saliva has a lot of sugar and that's what bacteria feeds on. Some studies say that saliva glucose readings are more accurate than blood glucose readings. That how we know this kit works.

## Project Description

Our prescription kit gives you a low cost screening and testing in the comfort of your own home. The D1 kit includes 3 devices: the Lollipop, the retainer, and the toothbrush/ tooth paste. Each of these items pertain to a different age group. First in our kit we have, The Lollipop. The lollipop is exactly what it sounds like, however; it is not completely edible. The outside of the device is disposable and has the flavoring, making it appealing to children. It has 3 capillaries that suck in the saliva to read the glucose in the child's mouth. After the flavor goes away you save the test strip on the inside of the lollipop for your next trip to the doctor. This is perfect for on the go testing before each meal and will make it much more enjoyable for your children. The second device in our kit is, The Retainer is a mouth piece that has a device on the lower part of the mouth piece. Using the MATLAB computing programming language using data, mean values and standard deviations with the formal "SE" equals "SD" divided by the square root of 'N'. This model is going to pick up salvia with this device and tell you if your glucose is high or low. High levels of bacteria are found in patients with diabetes due to the inability to buffer out sugars in the saliva, which is what our toothbrush focuses on. As the patient brushes, the saliva would be collected through the bricals as a glucose oxidase would be emitted from the push of a button. This process would indicate whether or not the levels of bacteria, and or glucose are of a high concentration in the mouth.

## Expected Outcomes

This product will effect everyone with diabetes, diagnosed and prescribed, live a more happy carefree life. Not only will they not have to dread pricking their fingers everyday for blood but they also don't have to make as many trips to the doctor. Our product is portable and can be used anywhere. It will stop the chance of diabetes by diagnosing people who might otherwise suffer the diabetes affects such as blindness, sores that don't heal or maybe even limb amputation. So with our D1 kit you can know how to control your diabetes. So go to your Doctor and get your D1 kit.



# Insolution

“we’ve found the solution to easier insulin intake”

Kelsey G., Drai H., Marylicia M., Yasmine M., & Markeis H.



C<sup>2</sup> Pipeline

## Introduction/Background/Why/Problem

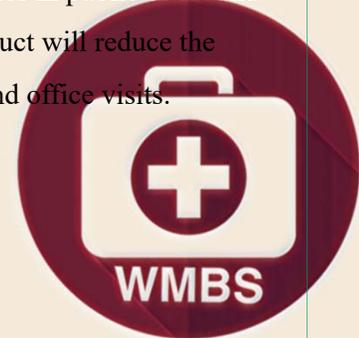
Diabetes affects 1 in 4 adults in the U.S. with most adults being diagnosed with Type 2 and Type 1 being found amongst children. For this reason, we have designed an insulin patch called *Insolution*. We have created this product to not only address the untimeliness of manually taking your blood sugar but the feeling felt by many children or adolescents and amplified with being a young diabetic which is; not fitting in. Our product is purposely made to look as discrete as possible for this very reason. One of our main goals to be accomplished with the making and selling of our item is to make the patient feel as comfortable as possible with managing their own diabetes. We also want our clients to feel less pressure with the responsibility of remembering to take insulin between meals and constant worrying about their blood sugar levels.

## Project Description

We have created two products, the first one being the insulin patch and the second being a Bluetooth connected app that receives information from a microchip placed within the patch. The patch works by storing insulin within a tubule. The tubule passes insulin through a thin, 1cm needle which anchors itself to the epidermal layer of the skin. The microchip processes how much insulin should be released by reading the blood sugar. Our insulin patch also addresses the wound clotting issue using nanotechnology. If the processing chip reads are off, the consumer is provided with an emergency insulin injection button within the app. The app also will send you periodic notifications stating your current blood sugar level, as well as suggested foods that will either raise your blood sugar, lower your blood sugar or maintain your blood sugar.

## Expected Outcomes

What is it we plan to accomplish with this product? Our plan is to make life easier for people with diabetes to accomplish the things they need or want to do. Some diabetic children can't even go out and have fun with their friends because they are diabetic and their parents would be worried about them getting what they need. Our patch also provides comfort in their own skin to children or adolescents who might be self conscious about managing their diabetes in public or around their peers. This product will reduce the number of hospital and office visits.





# PROdiaplate

Aniya Palmer, Kameron Hardge, Asia Lindsey,  
Richelle Michalak, Gigi Guha



## Introduction/Background/Why/Problem

It is common for most diabetics to complain about taking shots on a daily basis to measure their glucose level or wearing insulin pumps in both type 1 and type 2. However, the biggest problem from diabetics is portion control. Diabetics cannot control the amount of sugar intake in their blood because they cannot control their portion size. Unfortunately, the majority of the diabetics do not carry measuring cups everywhere they go. If a diabetic can't keep their glucose levels in a safe range, they could develop a number of long term health complications; that is why proportions are heavily enforced. The idea of our project is to enforce the strict idea of proportions unlike insulin shots or wearing watches, which are annoying and tedious. Our plate can be used for both type 1 and type 2 diabetics.



## Project Description

The “**PROdiaplate**” is a customized proportion plate for each diabetic for their specific dietary needs. The plate includes the big five food groups such as vegetables, proteins, dairy, grains, and fruits. Some diabetics may need more carbs because their starch content in their blood is low. Another example would be some diabetics needs to have a low amount of fruits because of the high the sugar content in fruits. The “**PROdiaplate**” will be waterproof, portable, and kidsafe. The plate is also both useful and affordable and will be available at a low cost through health insurance or MEDICAID/MEDICARE.

- On the plate, there are LED light sensors around the circumference of the plate such will include:
  - **Red**: “too much, needs to reconsider food proportions, dangerous to body”
  - **Yellow**: “warning, slow down, minimize food amount”
  - **Green**: “perfect, ready to eat.”
  - Using these common street light colors will be useful, because these colors are easy to recognize and are widely known.



## Expected Outcomes

Did you know that in the year 2000; 1 in 4 kids will develop diabetes? The outcomes of the **PROdiaplate** will start when the children are young, and will teach children the benefits of portion control at an early age. This plate will be successful because of three main characteristics of the plate: Affordable, Understandable, and Manageable. The **PROdiaplate** is:

- Affordable, because of instead of taking insulin shots, pills, or pumps, the diabetic will have an affordable customizable plate; paid for by their insurance; that is specifically tailored to their dietary needs.
- Understandable, because it is customly designed for each patient where all the tracks will work together: Medical, Pharmacy, Engineer, Social Worker, and Dentist to meet the needs for a specific patient. In addition to understand, the PROdiaplate will have LED light sensors that will give the diabetics a visual representation of the correct portion sizes for them.
- Manageable, because it is kidsafe; made with flexible BPA-free plastic and silicone; waterproof and dishwasher safe, and portable which can be taken to restaurants and other outings.

With the three main characteristics of the PROdiaplate; no diabetics should have a problem with keeping their portion sizes under control.

- ★ Every 6 months the patient will be checked out by their diabetic care team to see if the plate has improved their eating habits. The hope is that diabetes rates will slowly decrease because of the PROdiaplates, and that diabetic patients lives and diets will be improved in a positive way.