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## **Using Motion for Educational Information Design Max's Story: Teenagers with Type1 Diabetes**

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# Using Motion for Educational Information Design

Max's Story:  
Teenagers with Type1 Diabetes

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**Wenyu Ouyang**

A Thesis submitted to the Faculty of the  
College of Imaging Arts and Sciences

A Thesis submitted in partial fulfillment of  
the requirements for the degree of  
Master of Fine Arts in  
Visual Communication Design

School of Design  
Rochester Institute of Technology

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# Abstract

# Abstract

## **Using Motion for Educational Information Design Max's Story: Teenagers with Type1 Diabetes**

### **Keywords**

Motion graphics, Infographics, Educational information, Type 1 Diabetes (T1D), Medical info, Control Diabetes, Teenagers

### **Abstract**

Today, some younger people are suffering from chronic illnesses, such as diabetes, leukemia, and depressive disorder, which are some of the most significant concerns in the world. In spite of advancements made by modern science and technology, some chronic illnesses still last a lifetime, such as Type 1 Diabetes, known as T1D. In this situation, positive attitudes and correct understanding of the disease is extremely important in educating children how to manage their condition.

There are some excellent educational materials with a large quantity of text, which are good for parents to read. At the same time, there are picture books designed for children aged two to eight. However, the information in these books is too simple for teenagers. As for interactive apps about diabetes, some of them are directed toward medical professionals and students, but are too difficult and detailed for children to understand. What's more, the design of such apps is too serious and formal for children. Motion graphics is a new dynamic and appealing format to transfer information, using moving graphics and sound. The information becomes easier to understand. However, few themes of motion graphics talk about diabetes, let alone focus on helping young people can cope with negative feels about this illness.

This thesis project is a two and a half minute motion graphic telling a story about Max, a teenager coping with Type 1 Diabetes. The integration of visually interesting and dynamic motion graphics, sound, and storytelling are much more appealing to teenagers than just words on a page. In Max's story explains strategies he employs to cope with his blood sugar issues and have a positive attitude. This motion project utilizes the principles of design, animation and information graphics. Overall, the project provides a trial to combine educational information and motion graphics using a teenage-friendly way to communicate life-changing information.

# Introduction

# Introduction

## Situation Analysis

- 1 *Type 1 Diabetes* accessed September 22, 2014, <http://www.diabetes.org/diabetes-basics/type-1/?loc=db-slabnav>
- 2 *JDRF FACTS*, General Diabetes Information, February 2013
- 3 *JDRF FACTS*, JDRF and Diabetes Statistics, February 2013
- 4 *School Advisory Toolkit for Families*, accessed September 24, 2014 [http://www.cga.ct.gov/coc/PDFs/plti/JDRF\\_School\\_Advisory\\_Toolkit\\_revised\\_2010.pdf](http://www.cga.ct.gov/coc/PDFs/plti/JDRF_School_Advisory_Toolkit_revised_2010.pdf)
- 5 Kim Gosselin and Moss Freedman, *Taking Diabetes to School, Special Kids in Schools Series* (JayJo Books, 2004)
- 6 Jean Betschart-Roemer, *It's Time To Learn About Diabetes: A Workbook on Diabetes for Children* (Wiley, 1995)
- 7 *Diabetes App - blood sugar control, glucose tracker and carb counter* by BHI Technologies, Inc., accessed October 21, 2013, <http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>
- 8 *Diabetes in Canada* accessed September 22, 2014, <http://visual.ly/diabetes-canada-0>
- 9 *Social Diabetes motion graphics* by Leonardo Pereira accessed September 22, 2014, <https://www.behance.net/gallery/6949411/Social-Diabetes-motion-graphics>
- 10 *American Diabetes Association* accessed September 22, 2014, <http://www.diabetes.org/>

There is no doubt that the younger generation will be the main force in any country's development and future. In recent years, children's physical and mental health problems have become one of the most important topics of discussion. Nowadays, many children struggle with chronic illnesses such as diabetes, leukemia, and depressive disorder. It is important to educate children how to manage their condition.

Type 1 diabetes (T1D), previously known as juvenile diabetes, is an autoimmune disease in which a person's pancreas stops producing insulin, a hormone that enables people to get energy from food.<sup>1</sup> T1D usually strikes in childhood, adolescence, or young adulthood, and lasts a lifetime.<sup>2</sup> There are as many as three million Americans with T1D, and more than 15,000 children diagnosed with T1D in the United States.<sup>3</sup>

Since so many people are diagnosed with T1D in the United States, many products and designs for this group have emerged. There are many printed designs for T1D. Some of them are for adults to read, such as Juvenile Diabetes Research Foundation publicity material, which gives some basic knowledge of T1D.<sup>4</sup> Some of them are for younger children to read, such as picture books. For example, *Taking Diabetes to School* (Special Kids in Schools Series) is a picture book with colorful illustrations inside.<sup>5</sup> At the same time, there are also some workbooks on diabetes for children. For instance, *It's Time to Learn About Diabetes: A Workbook on Diabetes for Children* is an entertaining and easy-to-use guide which helps children ages eight to ten manage their diabetes in simple terms, and lets grade-schoolers know how to take care of themselves.<sup>6</sup>

In the interactive design field, some applications (apps) on multi-touch tablet devices provide an introduction to diabetes. For example, some help diabetes patients get a better handle on their blood sugar control. Others are digital cookbooks, helping people solve their everyday problem of healthy meal selections. "Diabetes Buddy- Control Your Blood Sugar" is a digital assistant managing blood sugar for diabetes patients.<sup>7</sup> Some motion graphics are attractive, such as introduction to the history and possible solutions for diabetes,<sup>8</sup> and related product promotions.<sup>9</sup> There are also some official websites offering different kinds of information about diabetes, such as the American Diabetes Association, <http://www.diabetes.org/><sup>10</sup>

In summary, there are picture books and workbooks to educate children about diabetes, but there is a lack of well-developed apps doing the same. Motion graphics is a good way to share information, but few of them focus on children's physical and mental health problems.

## **Problem Statement**

The problem this author wants to solve is how to encourage children to learn about T1D. How can children manage their daily life and have a positive attitude when faced with T1D? How can designers present the complicated information and new concepts in understandable and visually interesting ways? How to let children learn the important things about T1D in few minutes?

There is no doubt that there are some excellent educational materials. They have lots of text, which are good for parents to read. There are some good picture books that tell the story with leading characters about how to control their diabetes. Those books teach children they don't need to be afraid of diabetes, and they can manage their condition by themselves. At the same time, some books also use metaphor to explain complicated information. However, these picture books are designed for children two to eight years old. So the information in the books is too simple for teenagers.

There are some interactive apps about diabetes, but some of them are directed toward the medical professionals and students. These apps include the medical illustration and life-like 3D animation, which are too detailed for children to understand.<sup>1</sup> In addition, some apps to help control blood sugar are easy to use, but for children, the color and icon systems are a little bit serious and formal.<sup>2</sup>

Motion graphics is a new dynamic and attractive format to transfer information. With moving graphics and sounds, the information becomes very understandable. Other than the introduction of the history of diabetes and promotion of new products, few of the themes of motion graphics are talking about diabetes. They are not helping children to get rid of negative feelings and haven't encouraged them to manage their daily life and have confidence in their health.

In order to improve this, the author did research to see who should be her target audience. She found that teenagers are the group really needing good education. Teenagers are the most challenging group. They are the most difficult for having good sugar control. They struggle for independence, and don't want to follow instructions. Their growth and sexual hormones are at high levels and interfere with insulin activity. These are important years (ages 14 –18) in relation to diabetes complications. Teens have to think about self-identity, peer relationships and sexuality. It is often hard for them to be consistent.<sup>3</sup> The author chose teenagers recently diagnosed with T1D in the United States as her target audience.

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1 *Diabetes (Animated Pocket Dictionary series) Focus Apps* by Expanded Apps, accessed October 21, 2013, <https://itunes.apple.com/us/app/diabetes-animated-pocket-dictionary/id441879644?mt=8>

2 *Diabetes App - blood sugar control, glucose tracker and carb counter* by BHI Technologies, Inc., accessed October 21, 2013, <http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>

3 *School Advisory Toolkit for Families*, accessed September 24, 2014 [http://www.cga.ct.gov/coc/PDFs/plti/JDRF\\_School\\_Advisory\\_Toolkit\\_revised\\_2010.pdf](http://www.cga.ct.gov/coc/PDFs/plti/JDRF_School_Advisory_Toolkit_revised_2010.pdf)

# Literature Review

# Literature Review

## Introduction

The author's research focuses on content refinement and how to unify visual elements in a teenage-friendly way.

She started gathering information on diabetes from books that target different age groups. She also focused on human anatomy and physiology to better explain medical knowledge to teenagers. In addition, She read some books about information design and graphic design principles that include symbols, diagrams, pictograms, characters, color, layout, typeface and grid systems. Last but not least, she explored some books about motion graphics to understand the basic principles.

## Sources

### Diabetes and Medical Information

#### 1 **A First Book For Understanding Diabetes**

H. Peter Chase  
Novo Nordisk, 2008

This book helps people learn about diabetes at an early age. It is designed for children to learn with the assistance of an adult. It helps readers learn the basic knowledge of diabetes. It teaches reader how to manage diabetes no matter what patients circumstances are or their phase of life.

#### 2 **It's Time To Learn About Diabetes: A Workbook On Diabetes For Children**

Jean Betschart-Roemer  
Wiley, 1995

This book is an easy-to-use guide that explains diabetes in simple terms. It helps school-age children to learn about what's happening in their bodies. It shows children how to control their diabetes and feel good about themselves. It also has some exercises at the end of each chapter helping children review what they learned.

#### 3 **The Everything Parent's Guide To Children With Juvenile Diabetes: Reassuring Advice For Managing Symptoms and Raising a Happy, Healthy Child**

Moira McCarthy and Jake Kushner  
Adams Media, 2007

This book has comprehensive information for parents who have to raise a child with diabetes. The guide features advice on adjusting to life with diabetes, helping children take control of their health, monitoring diet and insulin levels, handling emergencies and finding support for parents and children.

#### **4 The Great Katie Kate Discusses Diabetes**

M. Maitand Deland MD and Jennifer Zivojn  
Greenleaf Book Group Press, 2010

This is a picture book for six years and older children to read. It has two main characters, Andrew, diagnosed with diabetes, and Katie Kate, a super hero who magically appears. Katie Kate introduces Andrew to other kids who also have diabetes, and takes him inside the human body to explain what's going on with him. With the knowledge of controlling diabetes, Andrew is no longer worried about his chronic illness.

#### **5 An Introduction to Human Disease Pathology and Pathophysiology Correlations**

Leonard V. Crowley, M.D.  
Jones and Bartlett Publishers, 2007

This book is designed for the introductory college level. The "Pancreas and Diabetes Mellitus" chapter provides a clear and well-illustrated explanation of the structure and function of the pancreas as well as biochemical disturbances in diabetes. It was helpful for me to understand the pathological knowledge of diabetes.

### **Design Information**

#### **1 Designing Information: Human factors and Common Sense In Information Design**

Joel Katz  
John Wiley & Sons, Inc, 2012

This book is an essential and comprehensive guide to understanding information design and how to make it better. It shows plenty of examples about using line, color, and form appropriately, and how to explain complex data and information visually. It provides design principles and ways to communicate in a simple, honest and accessible form.

#### **2 Information Design Workbook: Graphic Approaches, Solutions, And Inspiration + 30 Case Studies**

Kim Baer  
Rockport, 2008

This is a workbook with a methodical and comprehensive approach to convey innovation information design. It is packed with useful tips, ideas and stories from not only the author but also from information designers and agencies around the world. It is a good resource to know how processes work, what their problems are, and how to create formal quality and high function design.



### **3 The Practical Guide to Information Design**

Ronnie Lipton  
John Wiley and Sons, Inc, 2007

This book, which covers the principles of design, perception, and usability, teaches designers how to design effectively and present content clearly. With step-by-step examples, the book analyzes the processes necessary to dissect large quantities of information logically, and organize it so readers can clearly utilize the information towards the intended goals.

### **4 100 Things Every Designer Needs to Know About People**

Susan Weinschenk  
New Riders, 2011

This book combines real science and research with practical examples to deliver a guide every designer needs. With it one will be able to design more intuitive and engaging work for print, websites, applications, and products that matches the way people think, work, and play.

### **5 Moving Graphics New Directions in Motion Design**

Dopress  
Promopress, 2012

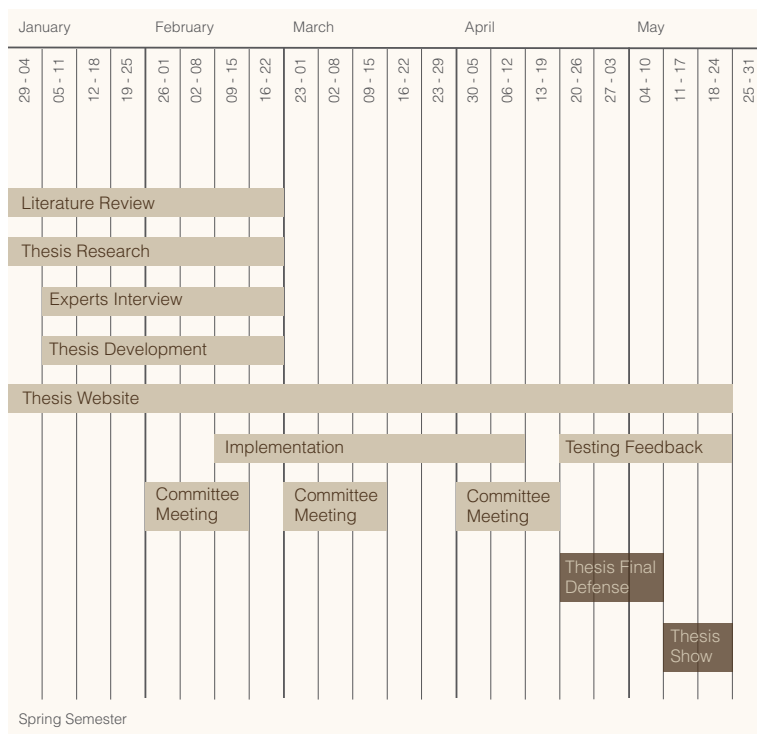
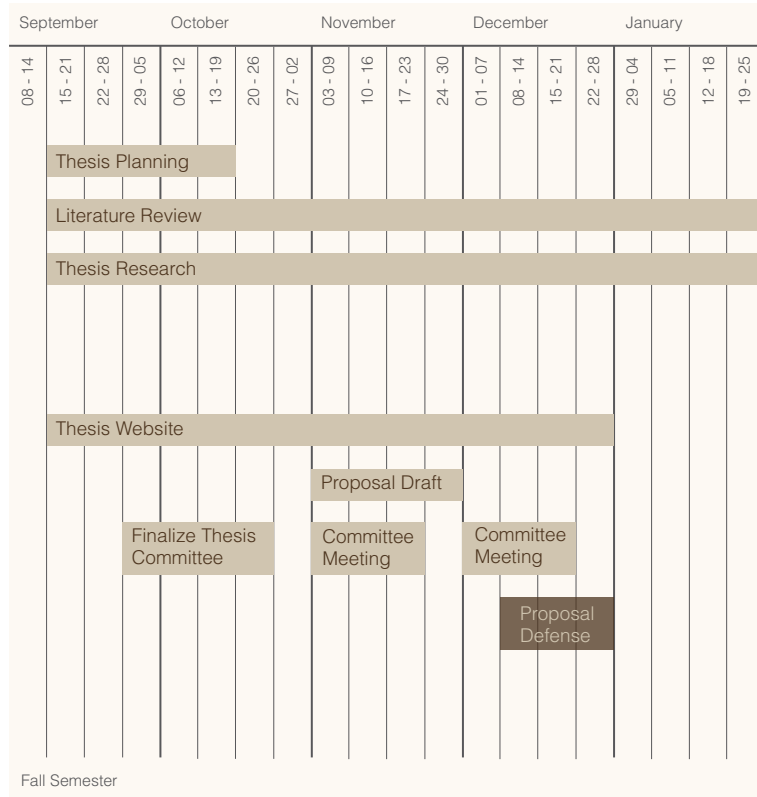
This book is an excellent showcase of the visually powerful motion graphics in the industry, which explore the elements of color, typography, movement, and sound across a wide range of media. With useful examples of the work, features, and images from professional motion graphics, the book offers an in-depth look at the dynamic area of creative design.

## **Conclusion**

After reviewing these resources, the author has brought together the most important information about diabetes for teenagers. She created visually interesting designs using information design, graphic design, and motion graphics principles.

# Process

# Timeline



# Existing Solutions

## Existing Infographic Design for Diabetes

### **Weight Loss Leads to Diabetes Prevention**

Agcmahfuz | October 21, 2013

<http://visual.ly/weight-loss-leads-diabetes-prevention>

### **Why type 2 diabetes in Australia is an issue**

Medibank | October 21, 2013

<http://visual.ly/why-type-2-diabetes-australia-issue>

### **Diabetes The Silent Epidemic**

USA | October 21, 2013

<http://visual.ly/diabetes-silent-epidemic>

## Existing Symbol Design for Health Issues

### **Children's Hospital Pictogram**

October 21, 2013

<http://webdesigneraid.com/40-amazing-examples-of-pictograms-for-your-inspiration/>

### **Medical Icon - Color**

September 25, 2014

<http://www.shutterstock.com/pic159130799/stock-vector-medical-icon-colorhtml?src=sBdYOOI8vNvxnmNxKrE2yQ-1-14>

## Existing Application Design for Diabetes

### **Diabetes App**

#### **Blood sugar control, glucose tracker and carb counter**

BHI Technologies, Inc. | October 21, 2013

<http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>

### **Diabetes App**

#### **Animated Pocket Dictionary Series**

Expanded Apps | October 21, 2013

<https://itunes.apple.com/us/app/diabetes-animated-pocket-dictionary/id441879644?mt=8>

### **iCookbook Diabetic App**

#### **Recipes and nutritional information plus health articles for people with diabetes**

Publications International, Ltd. | October 21, 2013

<https://itunes.apple.com/us/app/icookbook-diabetic-recipes/id541245203?mt=8c>

### **Diabetes App**

#### **eKnowledge - Diabetes: Lectures for Clinical P.**

Projects In Knowledge, Inc. | October 21, 2013

<https://itunes.apple.com/ca/app/eknowledge-diabetes-lectures/id424013592?mt=8>

**Existing Motion Graphics  
Screen Shots for Diabete**

**Diabetes in Canada**

September 24, 2014

<http://visual.ly/diabetes-canada-0>

**Do you fancy a drink**

September 24, 2014,

<http://www.youtube.com/watch?v=KsDZiDaS2bo>

**Értéktér**

September 24, 2014,

<https://www.youtube.com/watch?v=tGvwg7mlZ4E>

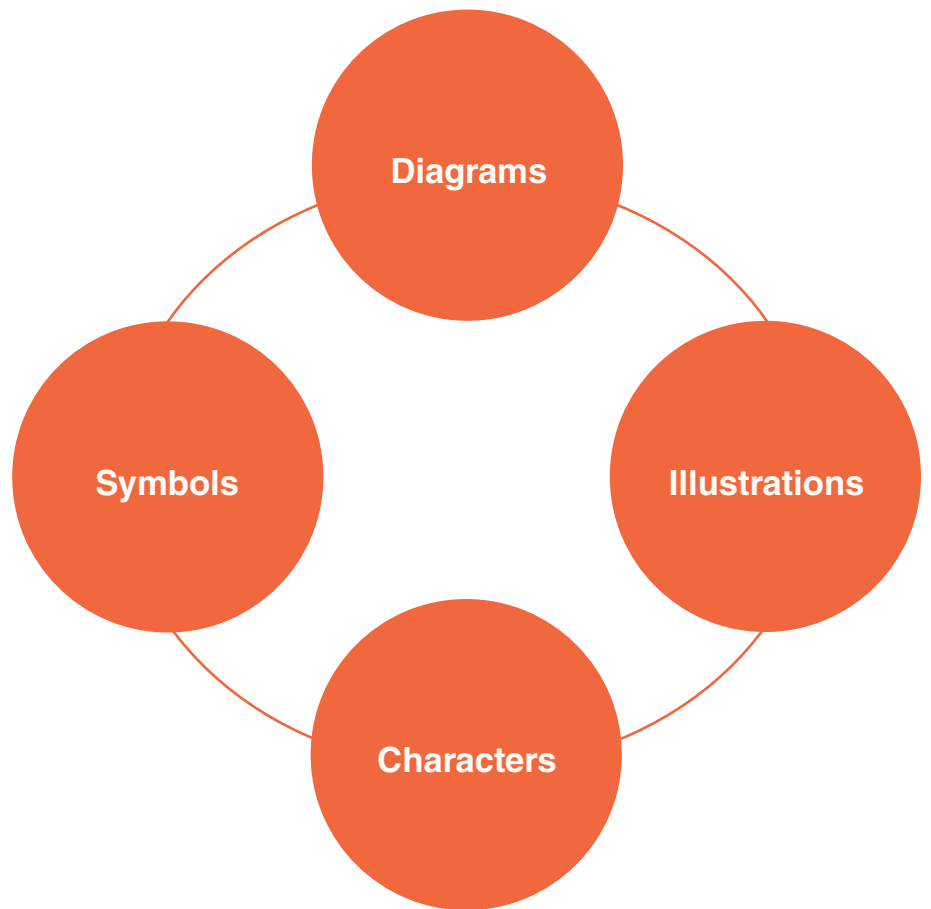
**Japan The Strange Country**

September 24, 2014,

<http://www.youtube.com/watch?v=Au0Ue7qCy6k>

## **Conclusion**

After reviewing these existing solutions, the author has decided to combine four kinds of non-verbal visual language in her motion graphics. There are Symbols, Diagrams, Characters and Illustrations.



# Story Contents

## Introduction

After reading some books, such as *A First Book For Understanding Diabetes*, *It's Time To Learn About Diabetes: A Workbook On Diabetes For Children*, and *JDRF Publicity material School Advisory Toolkit for Families*, the author summarized some significant information to help teenagers to control T1D. Most teenagers prefer to believe what their peers say. In order to have a better educational influence as well as increase their sense of trust, the author decided to create a teen character's own story to encourage other teenagers to learn about T1D.

The author also interviewed Bill Brewer, Director of Rochester Institute of Technology Exercise Science program, many times to make sure the story contents were based on scientific fact.

## Explanation of Story Contents

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### Specific story contents

### Why the author chose this information and edited in this way

---

In 2010, when I was 13, I was first diagnosed with Type 1 Diabetes. I could not believe it! I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. I felt shocked, sad, and afraid. Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations.

The main character Max is a teenager. He has negative feelings at the beginning, so that the story will build up sense of trust for audiences when they have the same situation. In order to call attention to T1D, it shows the shocking statistics and serious complications of T1D.

After I knew that approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States, I felt a little bit better because I knew I was not alone.

Using positive attitudes to face statistics, audiences will feel comfort since others face the same problems.

Unfortunately, I was diagnosed with Diabetic Ketoacidosis. Ketones made me very sick! DKA occurs when my cells can't get the energy they need from glucose, and my body begins to drain the energy away from muscle and fat making ketones, which become like poison to the body. They build up in the blood and are passed in the urine.

Very high blood sugar levels can lead to Diabetic Ketoacidosis (DKA). Informing teenagers about medical information concerns about high blood sugar.

---

**Specific story contents****Why I choose this information and edit in this way**

---

Eventually, I recovered from DKA. After that, a new trial awaited me. Not only do I have to worry about high blood sugar, I also have to worry about low blood sugar. I was learning how to drive last year, when one day, I forgot to eat my snacks on time. I was driving a car just like a drunk person. Thanks to my instructor sitting beside me, I avoided having an accident, and I learned that I should always have sugar with me.

Low blood sugar will happen when you don't have enough sugar. Informing teenagers about medical info concern about low blood sugar. Describe risks associated with low blood sugar.

From now on, I would handle these situations better. No sadness! No fear! I am going to control diabetes and not let it control me!! Now I am maintaining good sugar control. I can do this through food, insulin, testing and exercise. I am even using an alarm watch to remind me.

What you can do to control your blood sugar. Encourage audience to have a positive attitude and share their feelings.

In addition to talking with other teens in diabetes camp, I also talk to my family, doctors, nurses, and teachers about my situation and feelings, both in person and online. Getting their support makes me feel much more confident about controlling my sugar.

No sadness! No fear! We can control diabetes and not let it control us!! We can feel like everyone else and have a wonderful life.

Encourage audience again, and their trust in themselves to control their diabetes.



# Character Design

## Sketches for Different Characters

Figure 1

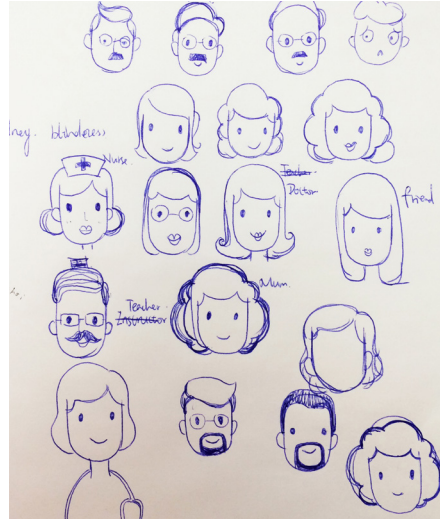


Figure 1: Sketches for different characters

## Sketches for Max

The taller ones are Max at 17 years old, the shorter guy is 13 year old Max. The author use geometrical shapes to build characters, which make them have simplicity and modern look. Figure 2

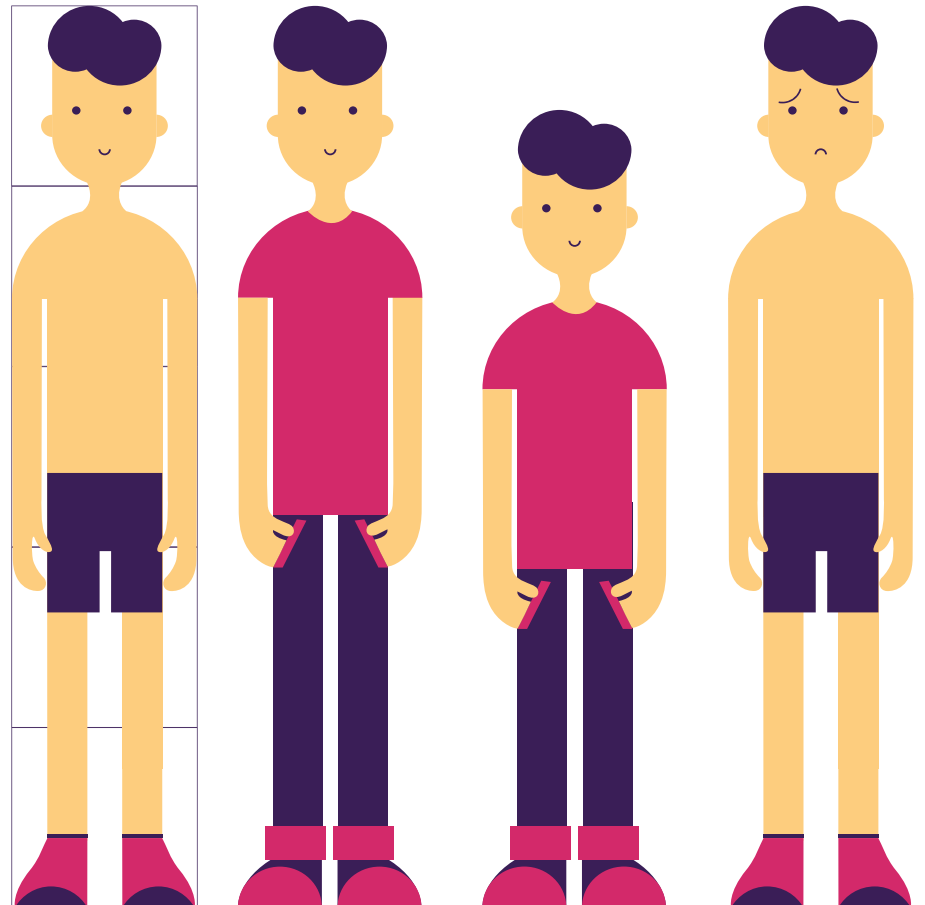


Figure 2: Sketches for Max

### Sketches Characters with Grid System

With the grid system, the characters are unified in a round shape. Figure 3

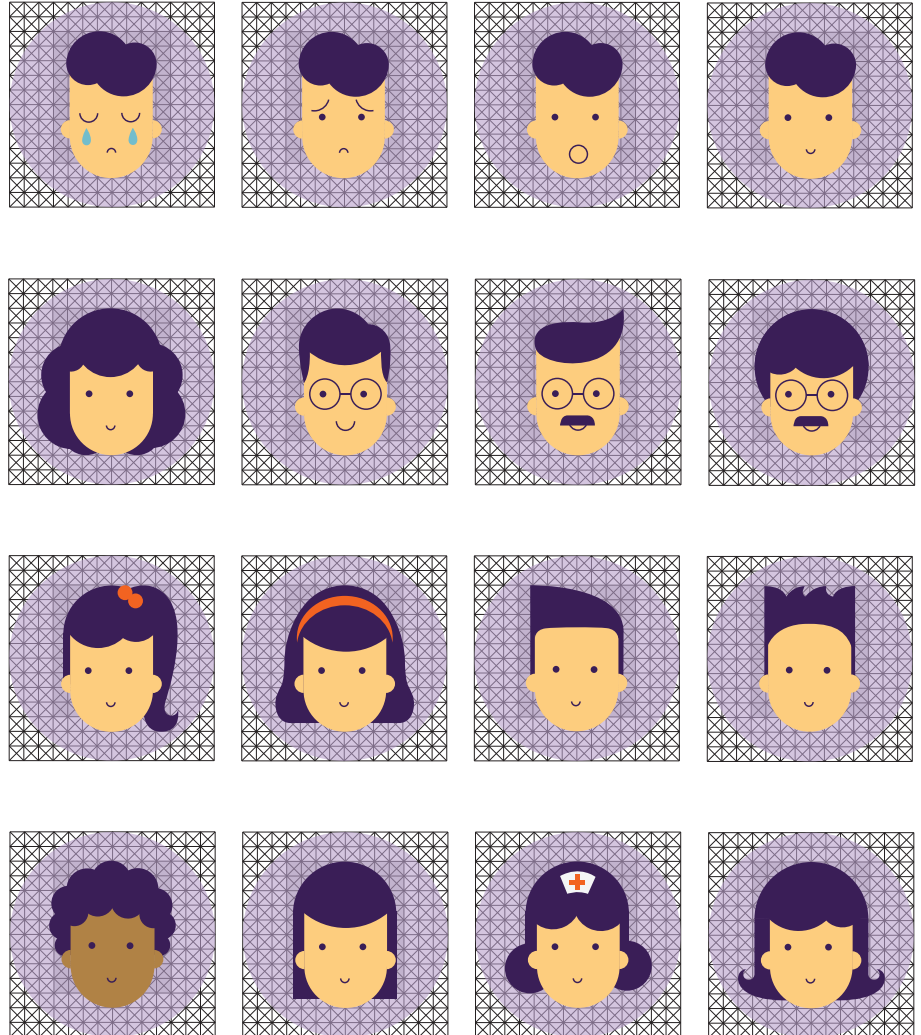


Figure 3: Sketches characters with grid system

## Final Characters

The first line:  
Mom, Dad, Max

The second line:  
Doctor, Nurse, Teacher

The third and fourth line:  
The friends Max met in  
diabetes camp

Unified the color scheme and  
modified the doctor character  
to make her recognizable. For  
the whole story, except Max,  
the author only use head icons  
to recognize other characters  
in this project. Figure 4



Figure 4: Final Characters

# Symbol Design

## Sketches for Different Symbols

The author used geometric shapes to unify the symbols.

Figure 1



Figure 1: Sketches for Different Symbols

## Symbols with Grid System Examples

The author chose her best solution to unify the symbols. Food, insulin, exercise, and testing symbols are examples shown in the grid system. The symbols are unified in a round shape, which makes them systematic. Figure 2

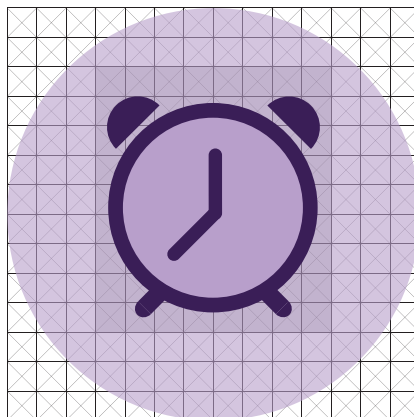
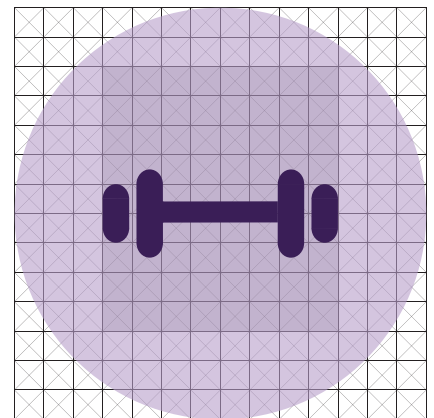
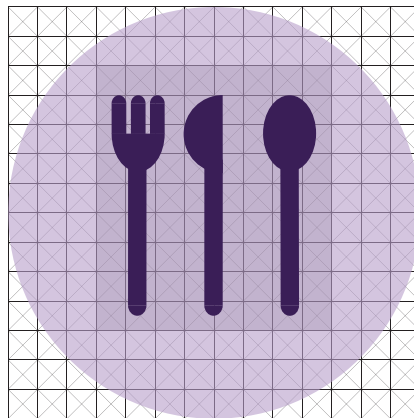
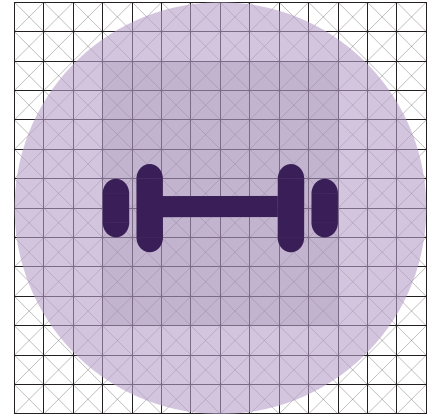
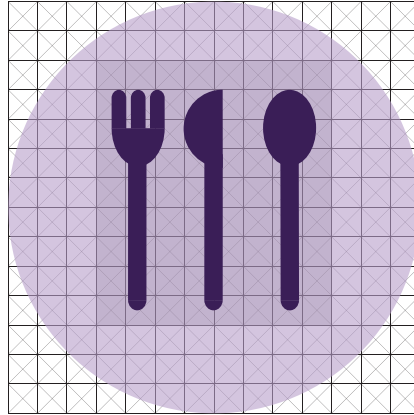


Figure 2: Symbols with Grid System Examples

## Final Symbols Examples

The color scheme of the five symbols. Figure 3



● **Food**



● **Insulin**



● **Testing**



● **Exercise**



● **Alarm**

# Diagram Design

## Sketches for Different Diagrams

### Sketch 1

The initial idea was creating an abstract shape of the United States map to represent the United States. The people pictograms covering the map represents 3,000,000 people.

### Story content

I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. Figure 1, Figure 2

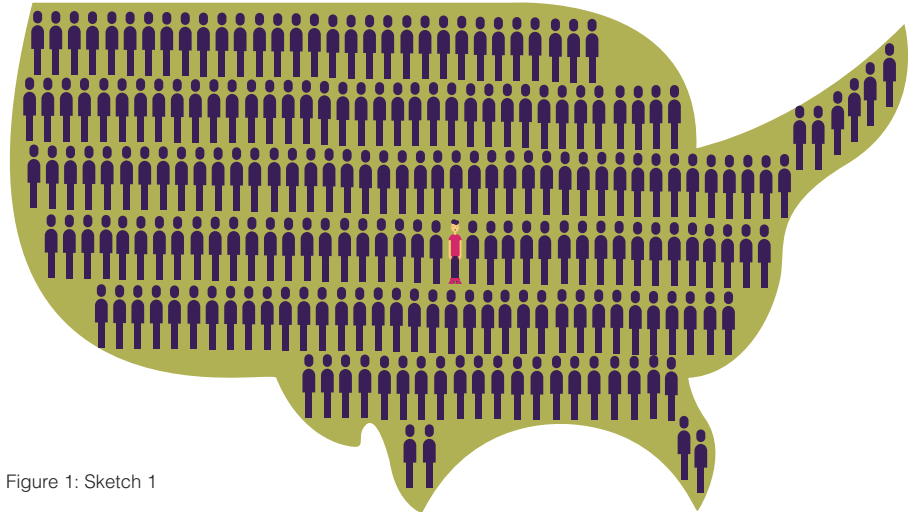


Figure 1: Sketch 1

### Sketch 2

The author used the United States flag to represent the United States instead of the US map, separating white and red for people pictograms. Since the author used lots of round shapes to unify the design, she also used a round shape for the flag.

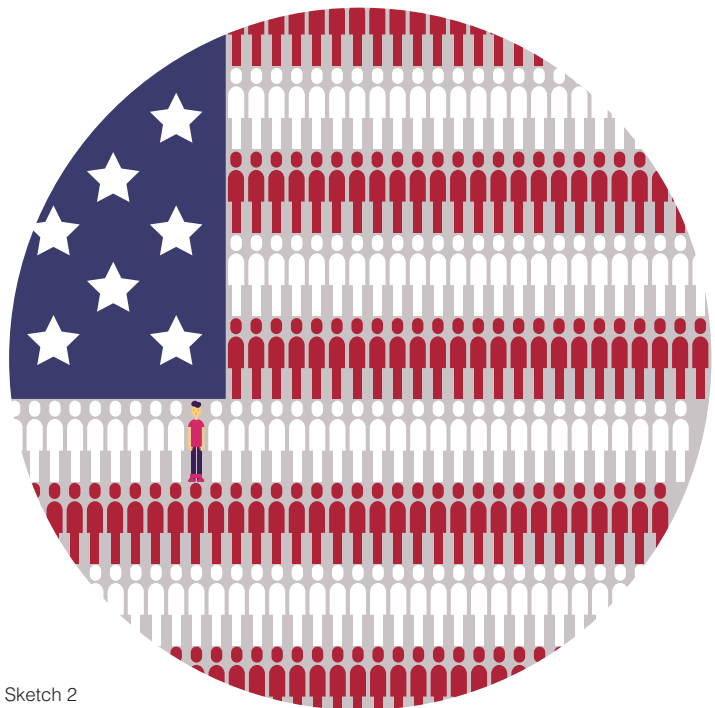


Figure 2: Sketch 2

### Story content

Approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States. Figure 3, Figure 4

#### Sketch 1

The initial idea was using a bar chart, which has 7 people pictograms to represent 7 days for a week. There are 4 parts for each day, each part means 20 people.

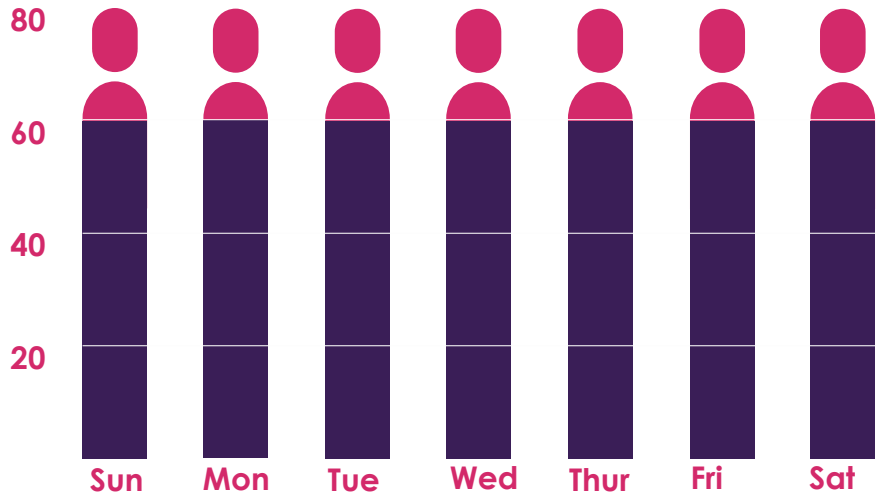


Figure 3: Sketch 1

#### Sketch 2

The author used the colors from the United States flag to relate the story to the United States. The chart has the exact number to show how many people a day are diagnosed with Type 1 Diabetes.

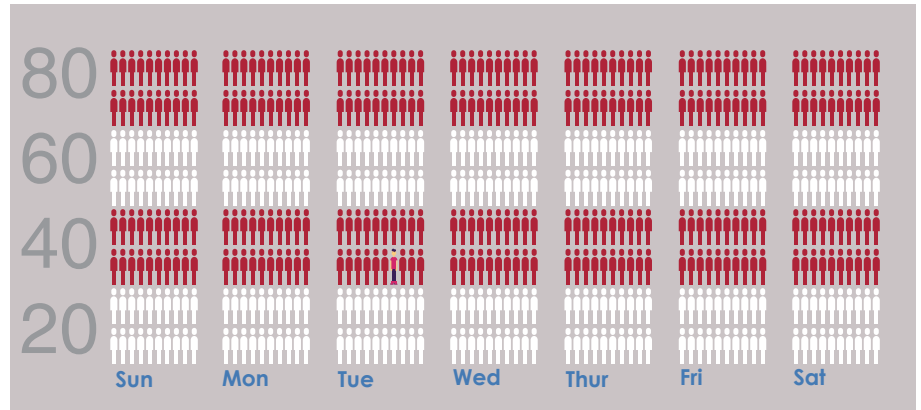


Figure 4: Sketch 2



### Story content

Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations. Figure 5

### Sketch 1

The look and feel of the symbol of Blindness is inconsistent with the symbols for Heart attack, Kidney failure, on nerve damage.

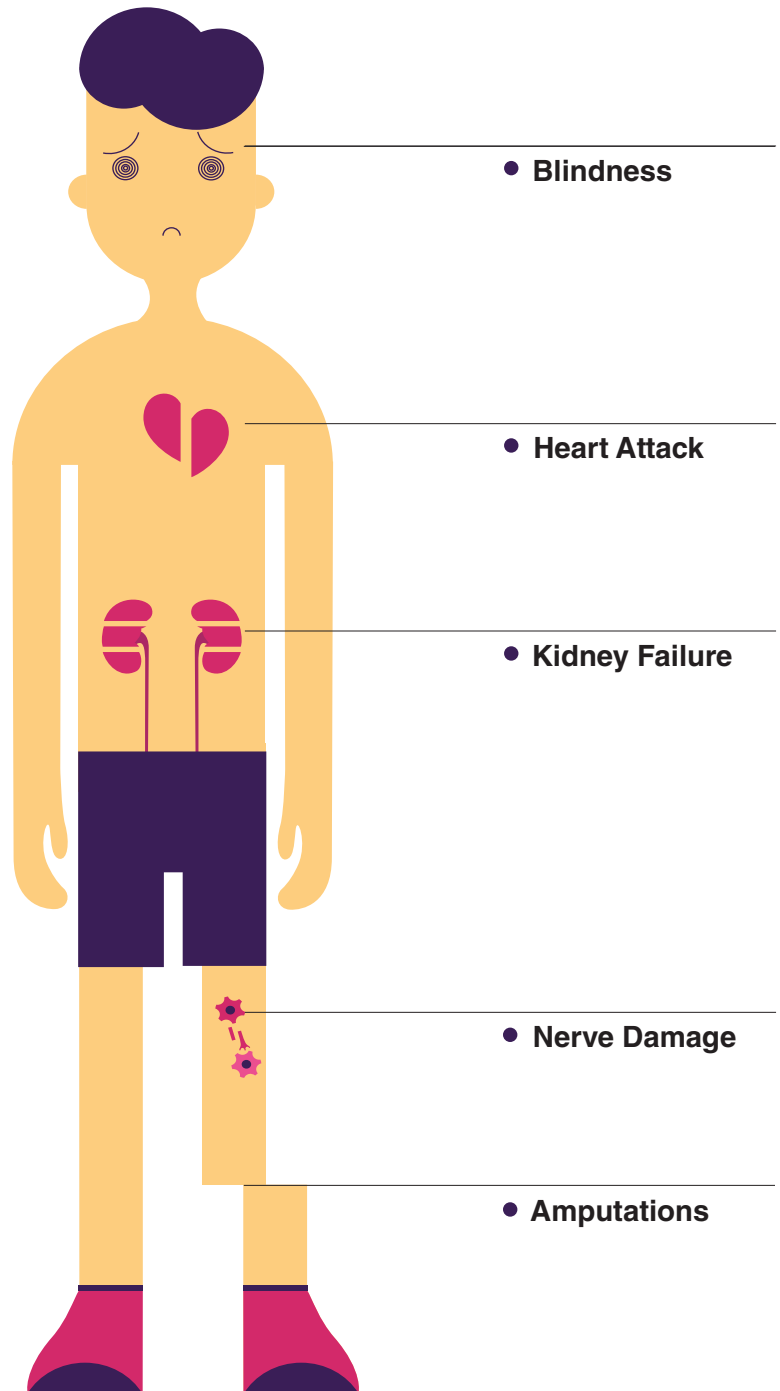


Figure 5: Sketch 1

### Story content

DKA occurs when my cells can't get the energy they need from glucose. Figure 6, Figure 7, Figure 8

#### Sketch 1

The energy in the diagram was a disconnected curve. The Capital G and C cannot represent Glucose and Cell.

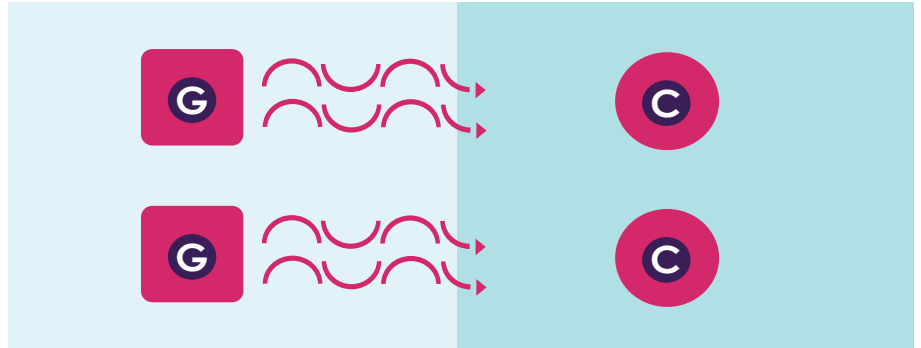


Figure 6: Sketch 1

#### Sketch 2

The disconnected energy was modified to become a connected curve from Glucose to the Cell.

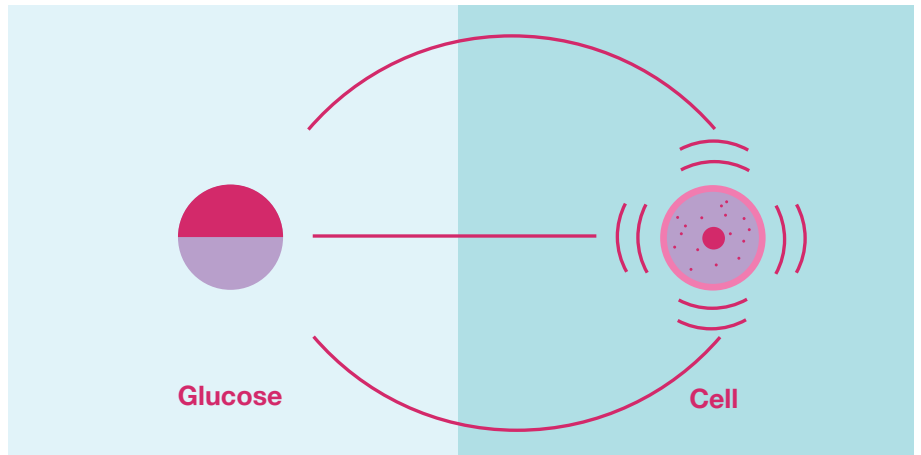


Figure 7: Sketch 2

#### Sketch 3

Arrows added at the end of the energy curve show the cell should get the energy from glucose on the left side and the cell can't get the energy from glucose on the right side.

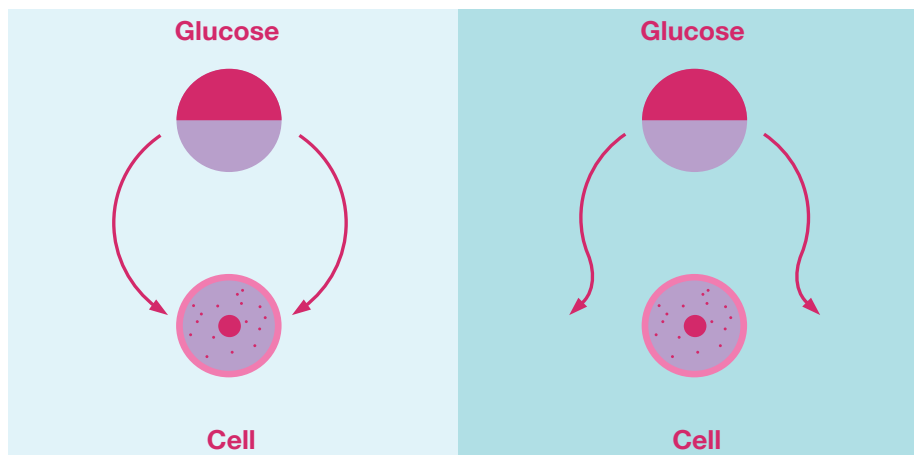


Figure 8: Sketch 3

### Story content

Ketones become like poison to the body. They build up in the blood and are passed in the urine. Figure 9, Figure 10

#### Sketch 1

The Capital K can't represent Ketones without explanation.

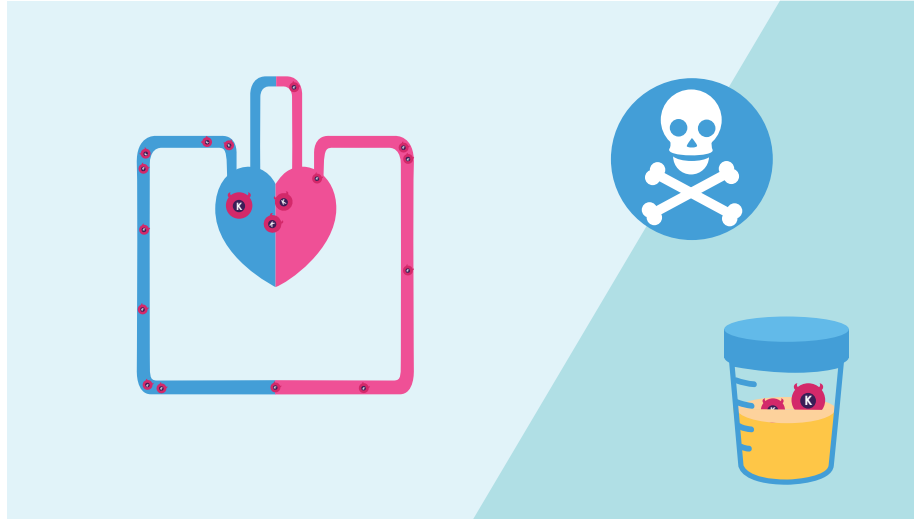


Figure 9: Sketch 1

#### Sketch 2

Adding a body behind the blood system makes the diagram more recognizable.

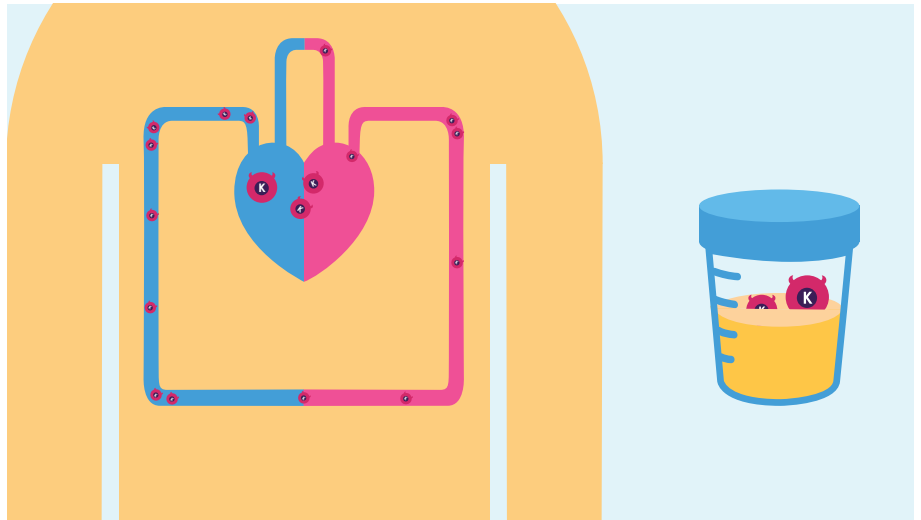


Figure 10: Sketch 2

**Final Diagrams**

This is after collecting feedback from the evaluation survey and doing research for good examples of infographics. First, the author changed the color scheme of the diagrams. In addition, she added some necessary text to make the information more understandable.

**Story content**

I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. Figure 1

**Explanation**

Since this part is about statistics, using text to show the number emphasizes that this is a huge number of people.

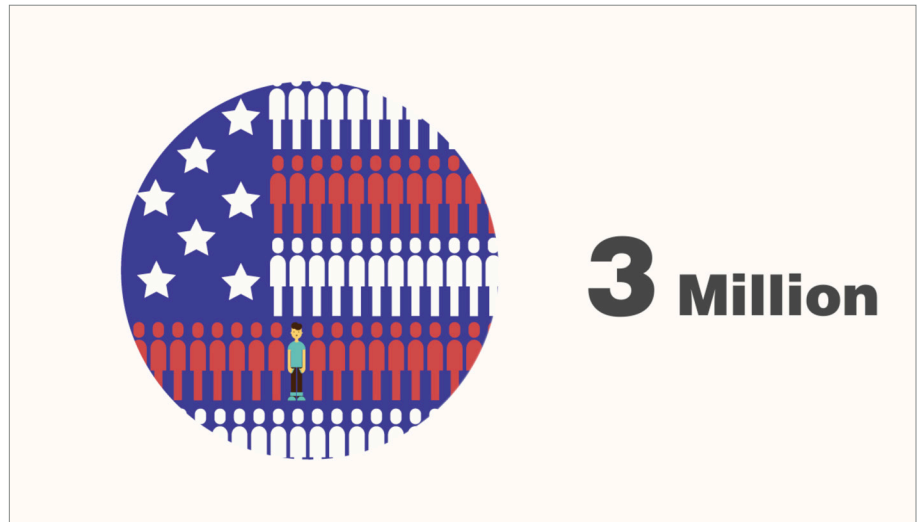


Figure 1: 3 million people with T1D in US

**Story content**

Approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States. Figure 2

**Explanation**

The color scheme was simplified and text was added to the top of the diagram, which emphasized T1D.

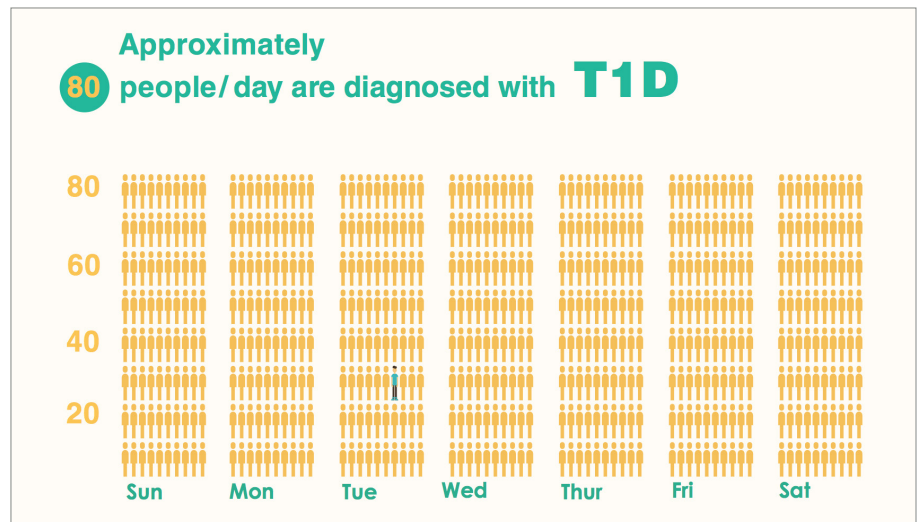


Figure 2: 80 people /day are diagnosed with T1D

### Story content

Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations.

Figure 3, Figure 4, Figure 5, Figure 6, Figure 7

### Explanation

The author separated different serious complications, used several circle lines on the organs to represent those complications.

The final solution of those diagrams will transfer to motion graphics with audio. The break of each complication is so short to show the text of blindness, heart attack, kidney failure, nerve damage, and amputation. The author only kept the *complications* here, so that the audience can keep their eyes on the motion graphics.

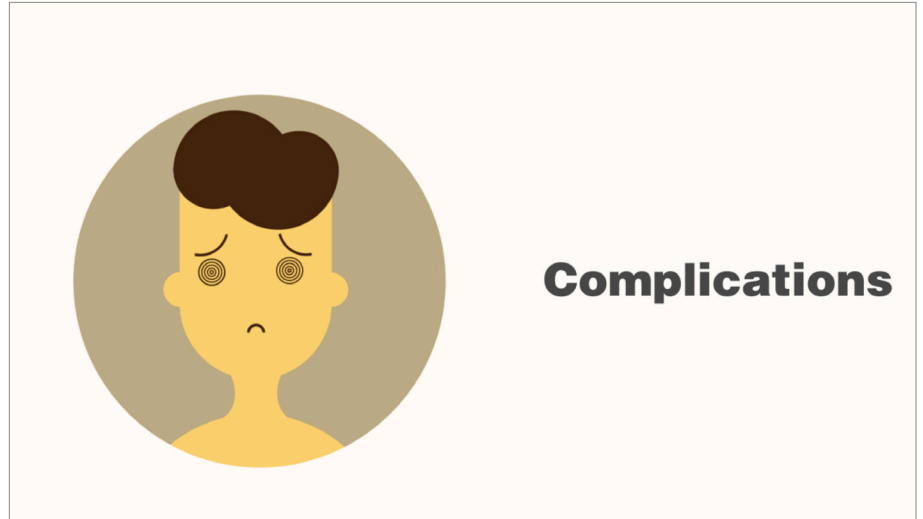


Figure 3: Blindness

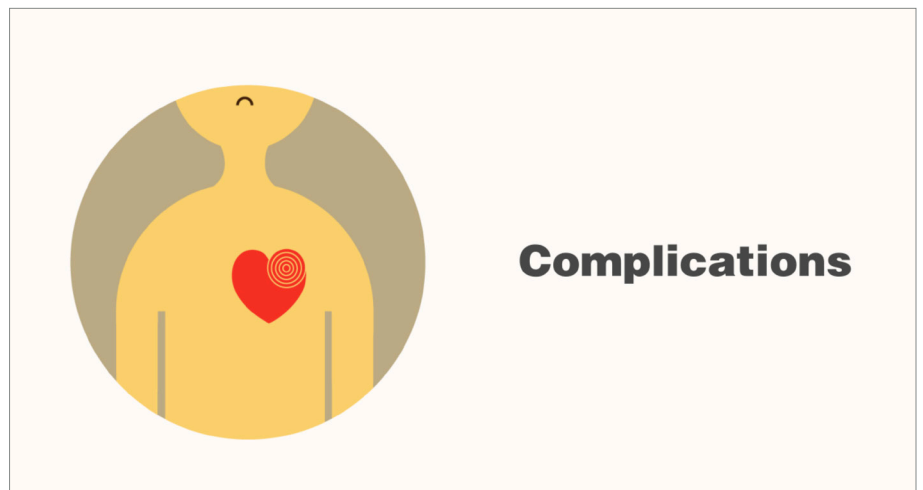


Figure 4: Heart attack

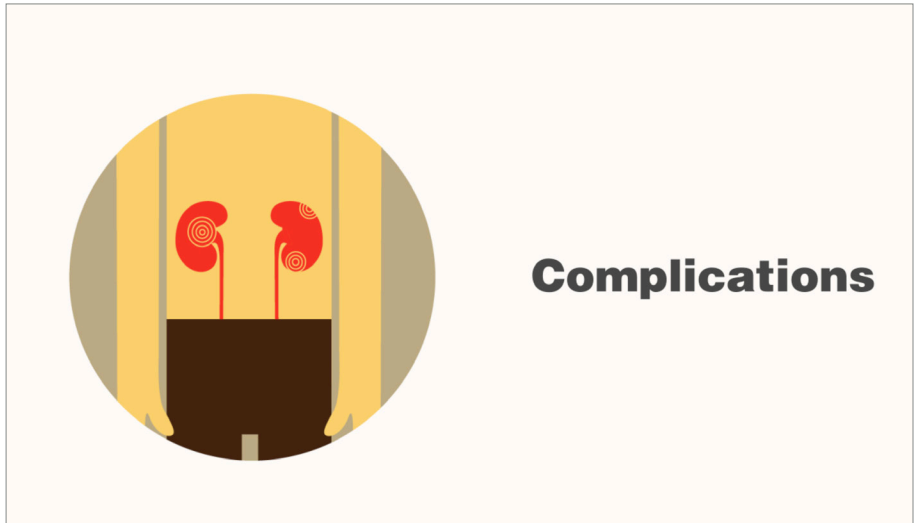


Figure 5: Kidney Failure

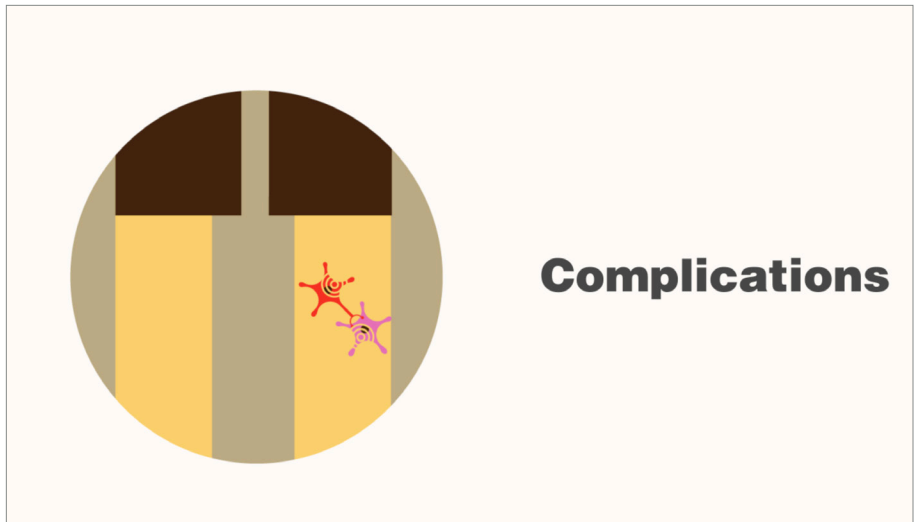


Figure 6: Nerve Damage

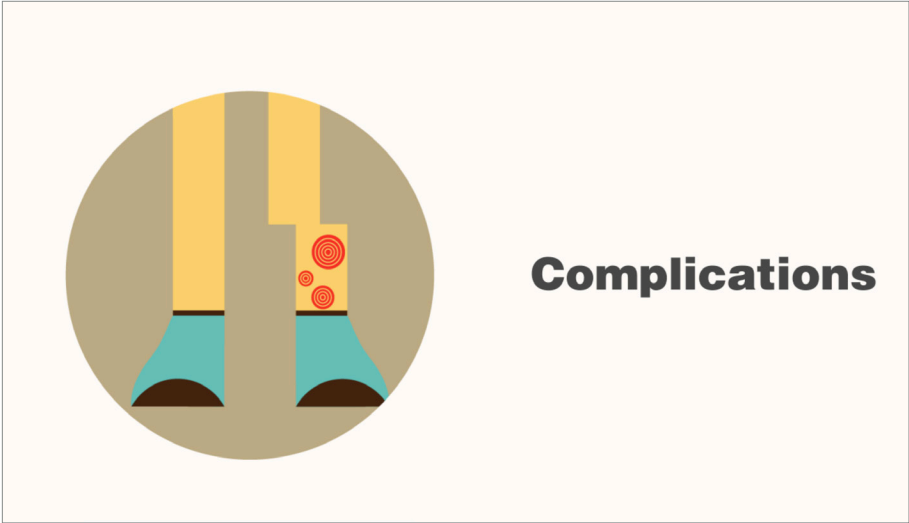


Figure 7: Amputations

**Story content**

Ketones made me very sick! Figure 8

**Explanation**

Word and symbols of ketones show at the same time, which help the audiences learn the unfamiliar symbol. Audiences also tell that ketones are bad by use of the devil horns.

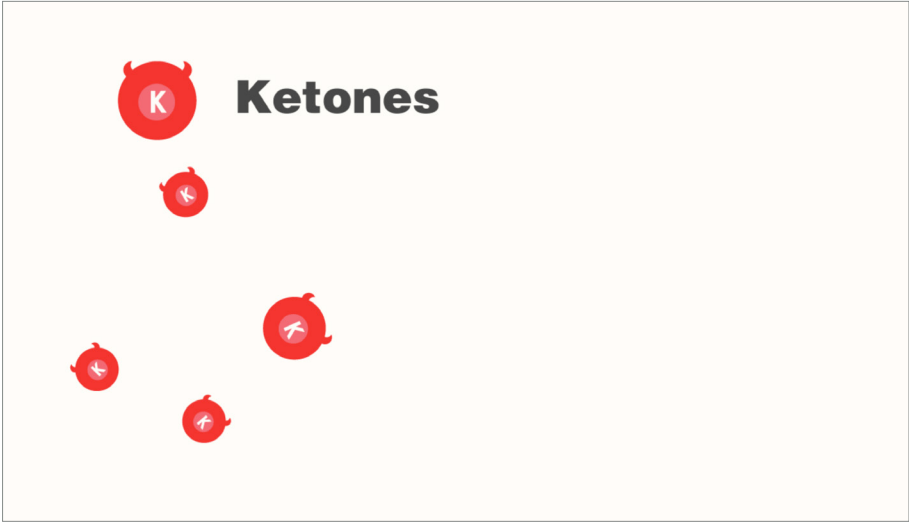


Figure 8: Ketones

**Story content**

DKA occurs when my cells can't get the energy they need from glucose.

**Explanation**

Because Diabetic Ketoacidosis are difficult and unfamiliar words, keeping it on the screen for awhile is very important to help audience learn what they mean. Thanks to the final solution in motion graphics, the arrows can change directions to show cells can't get the energy from glucose.

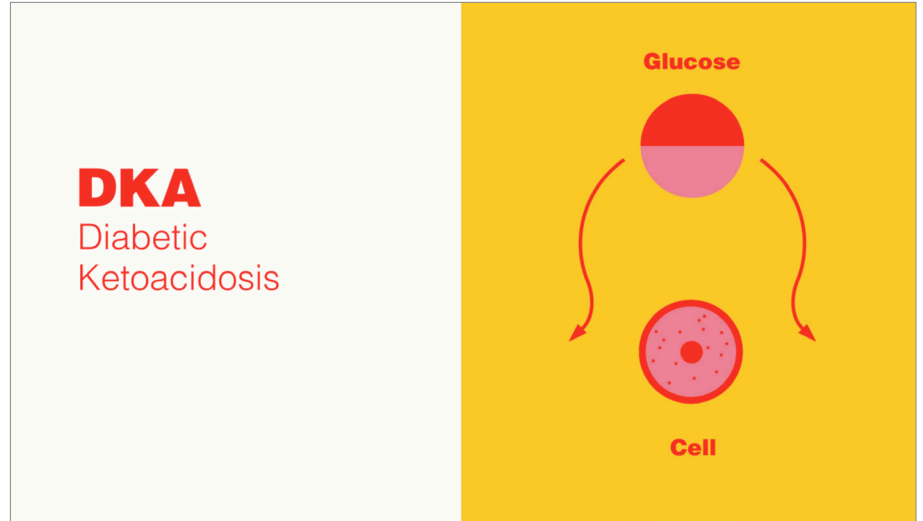


Figure 9: DKA occurs when my cells can't get the energy they need from glucose

**Story content**

Ketones become like poison to the body. They build up in the blood and are passed in the urine.

**Explanation**

Audience can tell the Ketones symbols without text, because they have already appeared with text before.

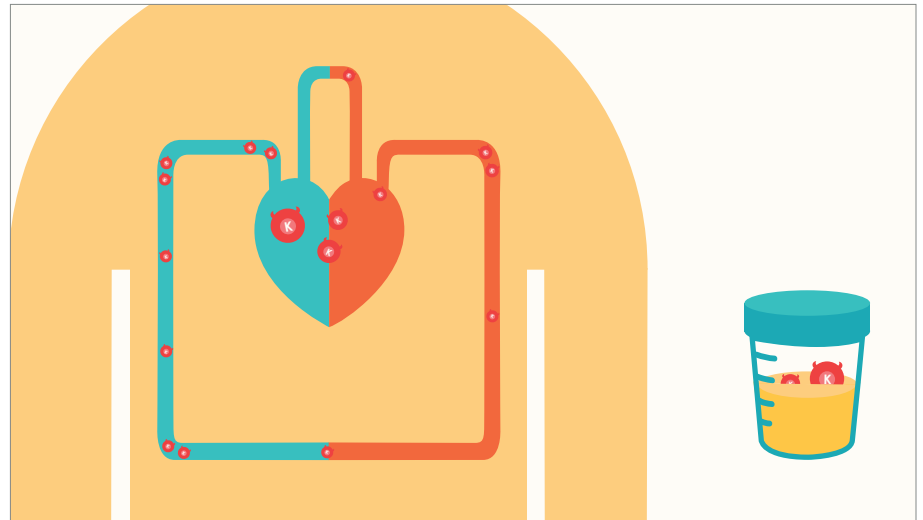


Figure 10: Ketones become like poison to the body



# Storyboard Design

## Selected Storyboard Sketches

1. I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. Figure 1

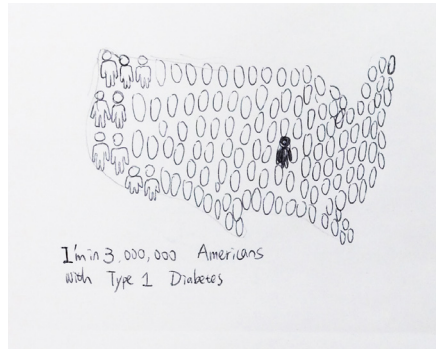


Figure 1: Sketch 1

2. I felt shocked, sad, and afraid. Figure 2

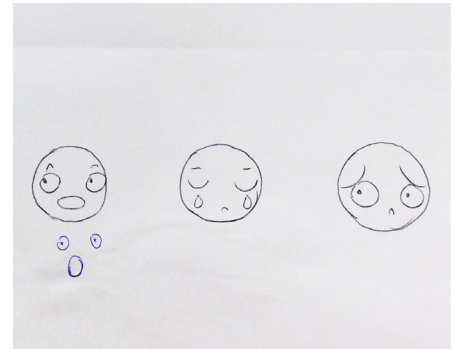


Figure 2: Sketch 2

3. Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations. Figure 3

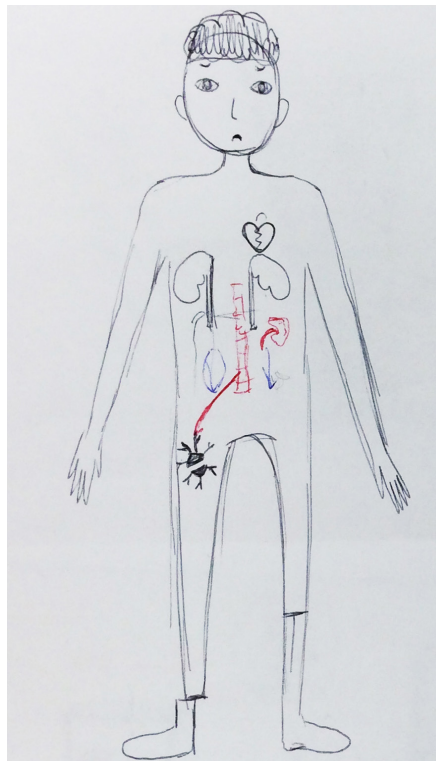


Figure 3: Sketch 3

4. After I knew that approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States, I felt a little bit better because I knew I was not alone. Figure 4, Figure 5

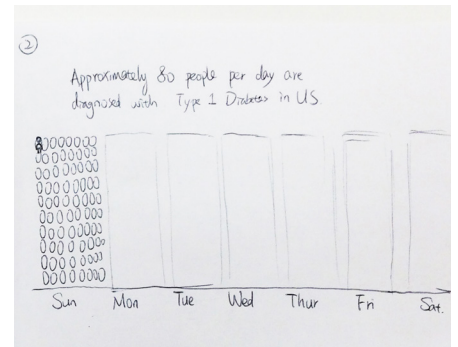


Figure 4: Sketch 4

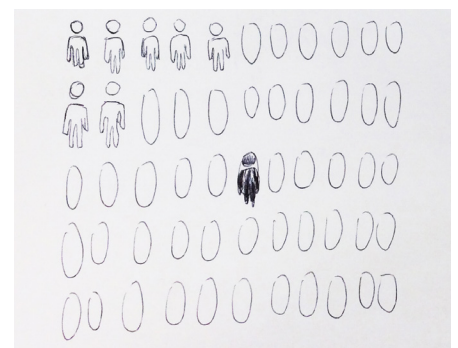


Figure 5: Sketch 5

5. Unfortunately, I was diagnosed with Diabetic Ketoacidosis. Ketones made me very sick! Figure 6



Figure 6: Sketch 6

6. DKA occurs when my cells can't get the energy they need from glucose. Figure 7

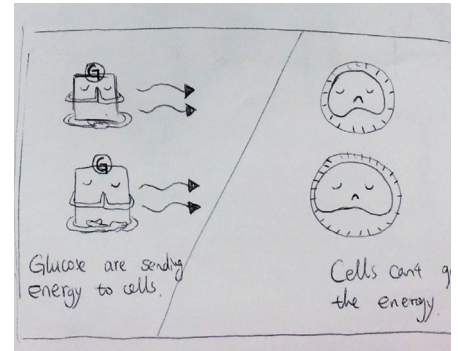


Figure 7: Sketch 7

7. My body begins to drain the energy away from muscle and fat making ketones, which become like poison to the body. Figure 8

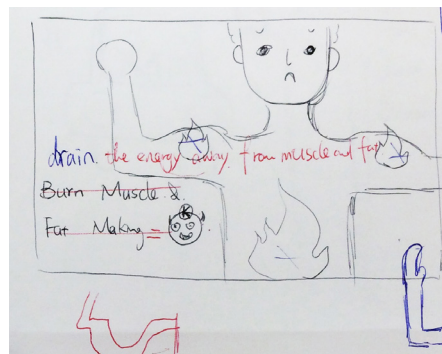


Figure 8: Sketch 8

8. They build up in the blood and are passed in the urine. Figure 9

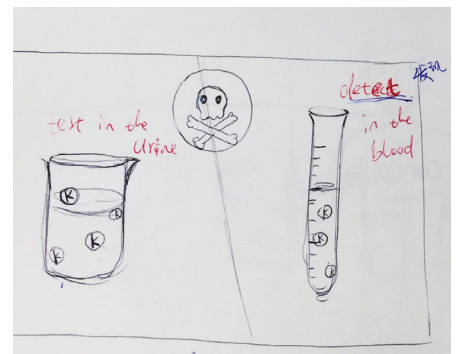


Figure 9: Sketch 9

9. Eventually, I recovered from DKA. After that, a new trial awaited me.

Figure 10

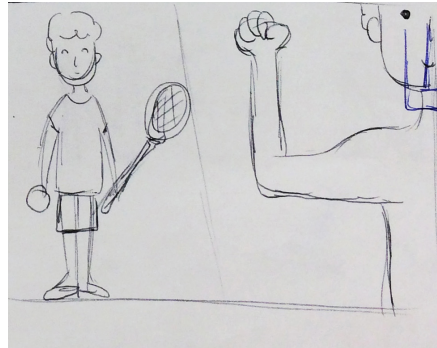


Figure 10: Sketch 10

10. I was learning how to drive last year. One day, I forgot to eat my snacks on time. I was driving a car just like a drunk person.

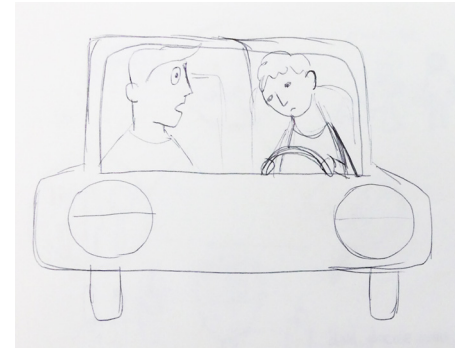


Figure 11: Sketch 11

11. Thanks to my instructor sitting beside me, I avoided having an accident, and I learned that I should always have sugar with me.

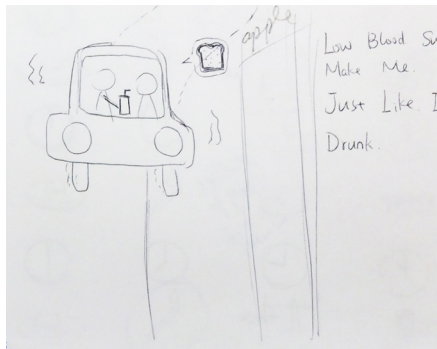


Figure 12: Sketch 12

12. From now on, I would handle these situations better.



Figure 13: Sketch 13

13. No sadness! No fear! I am going to control diabetes and not let it control me!! Figure 14

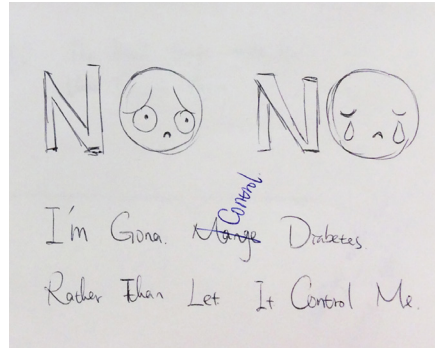


Figure 14: Sketch 14

14. Now I am maintaining good sugar control. I can do this through food, insulin, testing and exercise. Figure 15

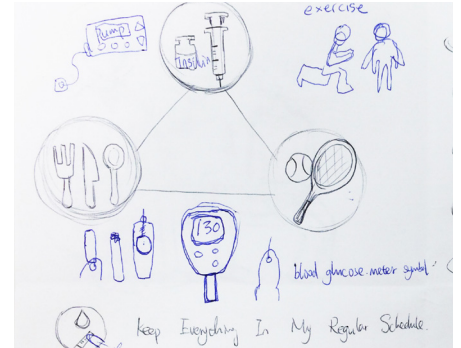


Figure 15: Sketch 15

15. I am even using an alarm watch to remind. Figure 16

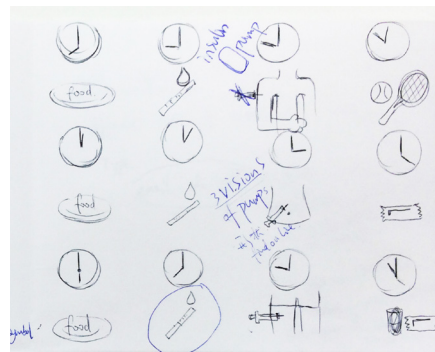


Figure 16: Sketch 16

16. In addition to talking with other teens in diabetes camp, I also talk to my family, doctors, nurses, and teachers about my situation and feelings, both in person and online. Figure 17, Figure 18



Figure 17: Sketch 17

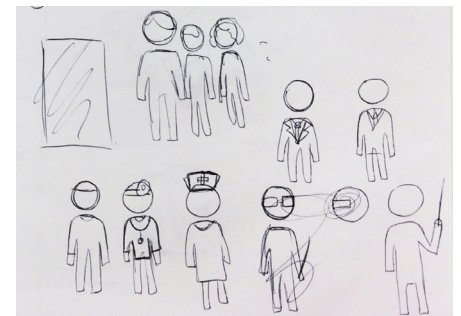


















Figure 18: Sketch 18

**Final  
Color Scheme**

	R G B	242 119 127		R G B	79 54 32
	R G B	99 197 187		R G B	131 137 135
	R G B	254 205 127		R G B	242 104 62
	R G B	208 197 174		R G B	15 181 157
	R G B	204 204 203		R G B	19 117 127
	R G B	239 66 64		R G B	231 177 125
	R G B	33 190 203		R G B	174 129 69
	R G B	254 197 71		R G B	255 250 245

## Typography

“Max’s Story: A Teenager with Type 1 Diabetes” uses the typeface Helvetica LT Std. Helvetica LT Std is one of the derivations of Helvetica,<sup>1</sup> which is among the most widely used sans-serif typefaces.<sup>2</sup> Helvetica LT Std is easy to read on screens. It has several different weight options. The author chose three weight options, which are able to provide variations and visual information hierarchies.

Helvetica LT Std  
Light

**Helvetica LT Std  
Bold**

**Helvetica LT Std  
Black**

---

<sup>1</sup> *Helvetica Font: Helvetica LT Std (Complete)*, accessed October 9, 2014, <http://www.ephifonts.com/free-helvetica-font-helvetica-lt-std-complete.html>

<sup>2</sup> *Helvetica*, accessed October 9, 2014, [http://en.wikipedia.org/wiki/Helvetica#Similar\\_typefaces](http://en.wikipedia.org/wiki/Helvetica#Similar_typefaces)

**Final Color  
Complete Storyboard**

Hi, I am Max, and this is my story. Figure 1

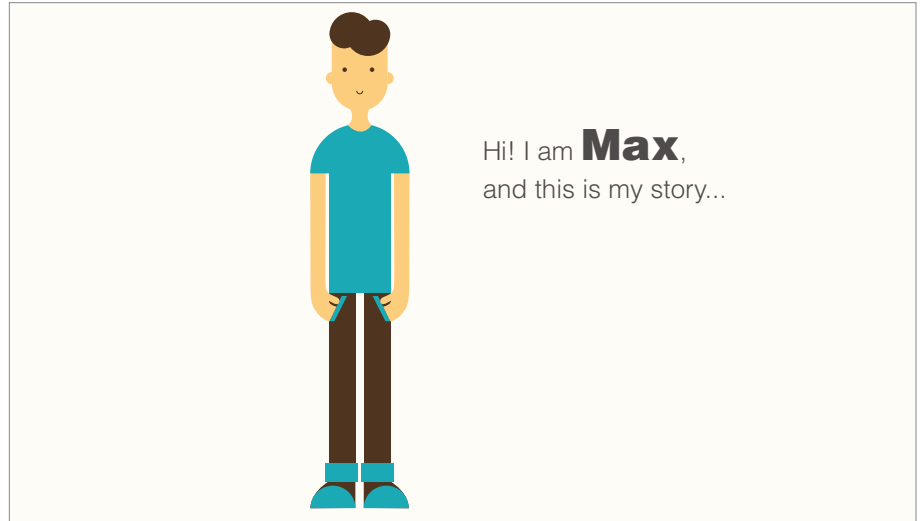


Figure 1

In 2010, when I was 13, I was first diagnosed with Type 1 Diabetes. Figure 2

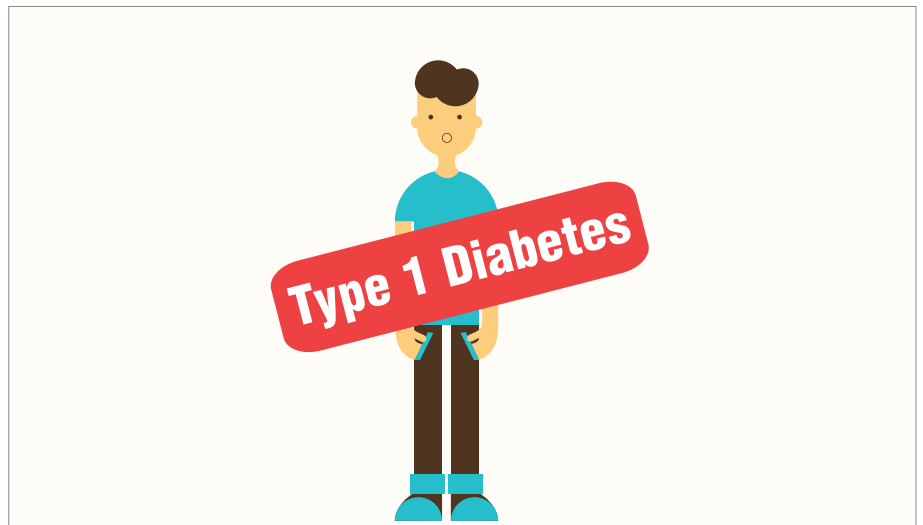


Figure 2



I could not believe it! I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. Figure 3

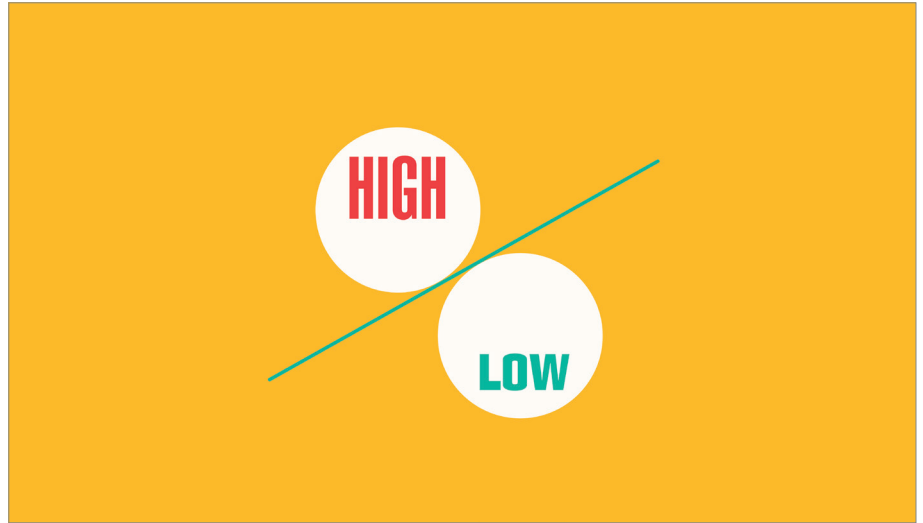


Figure 3

I felt shocked, sad, and afraid. Figure 4

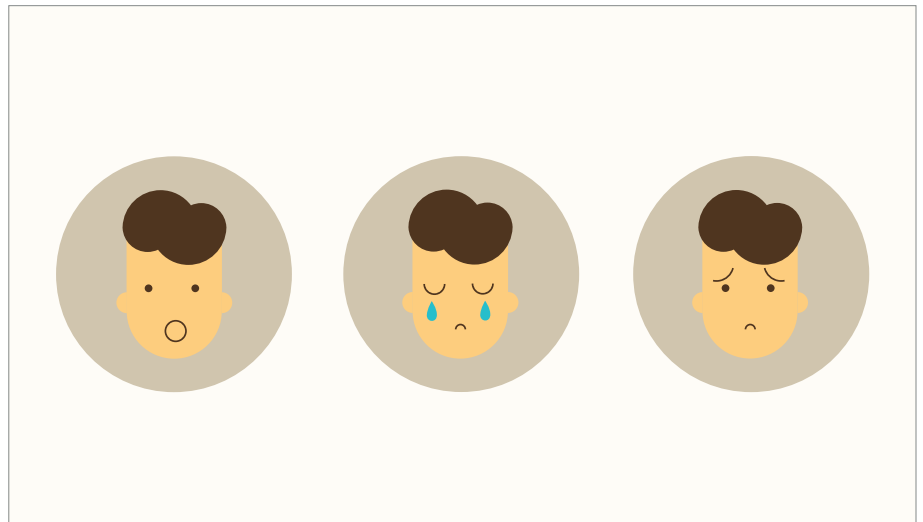


Figure 4



Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations. Figure 5, Figure 6, Figure 7, Figure 8, Figure 9

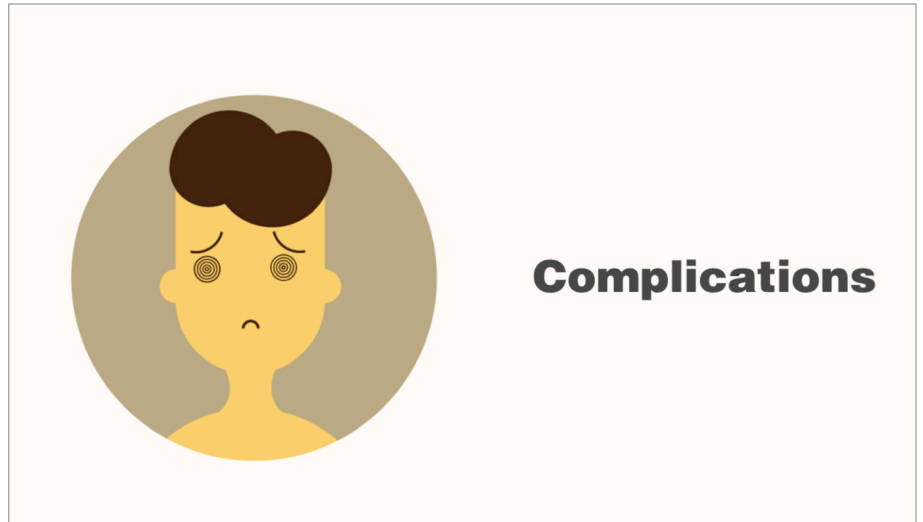


Figure 5

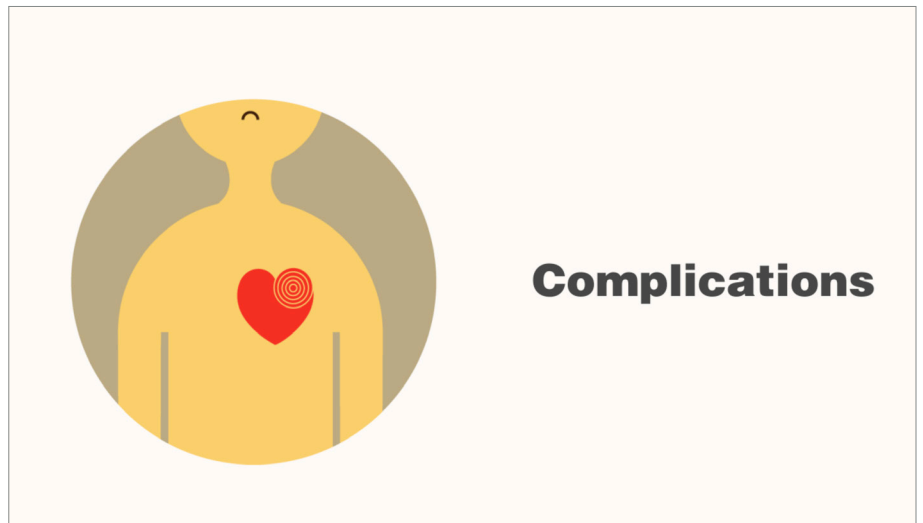


Figure 6

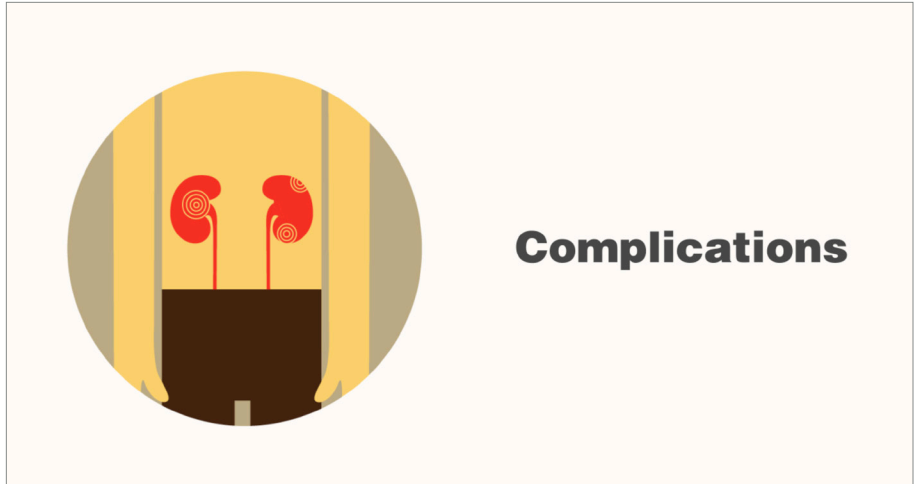


Figure 7

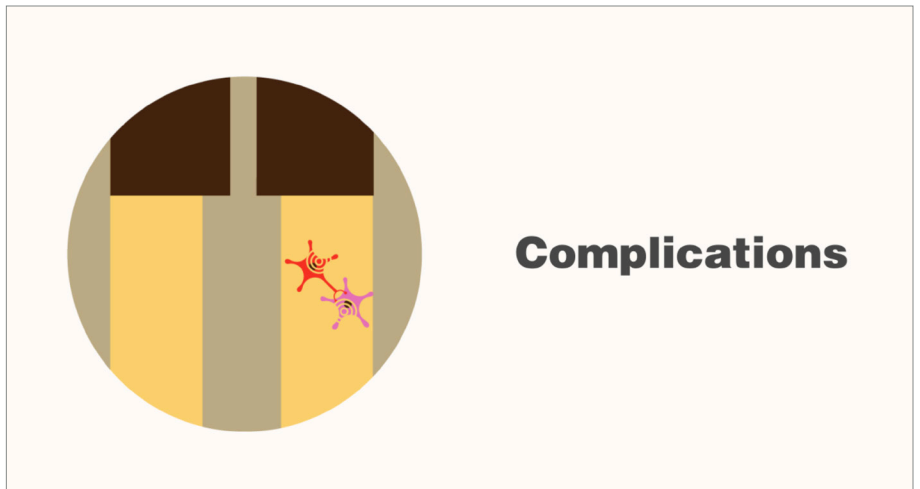


Figure 8

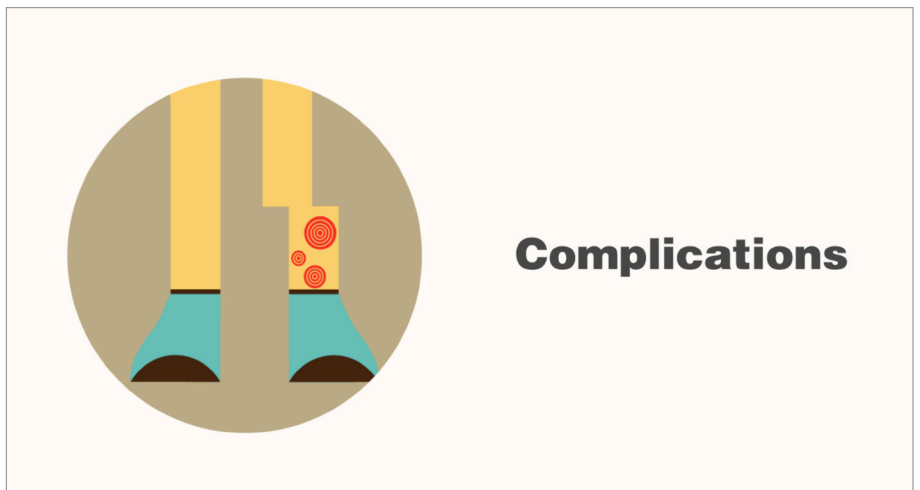


Figure 9

After I knew that approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States, I felt a little bit better because I knew I was not alone. Figure 10, Figure 11

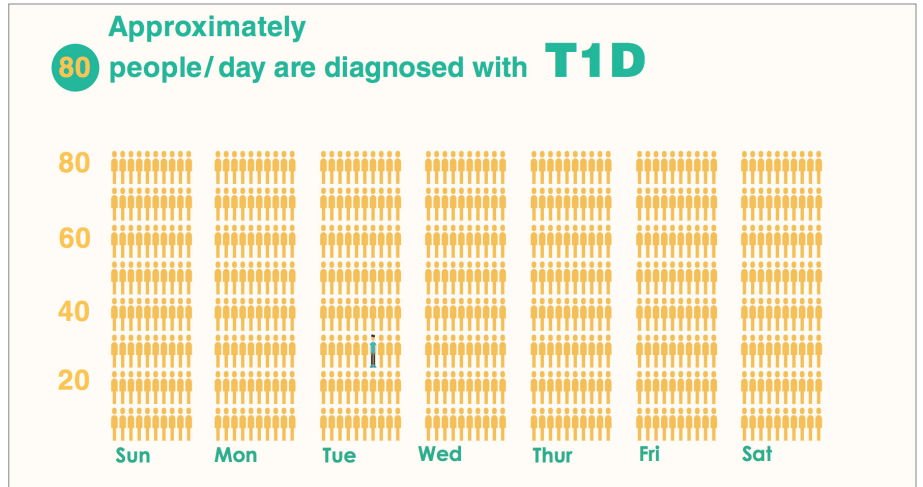


Figure 10

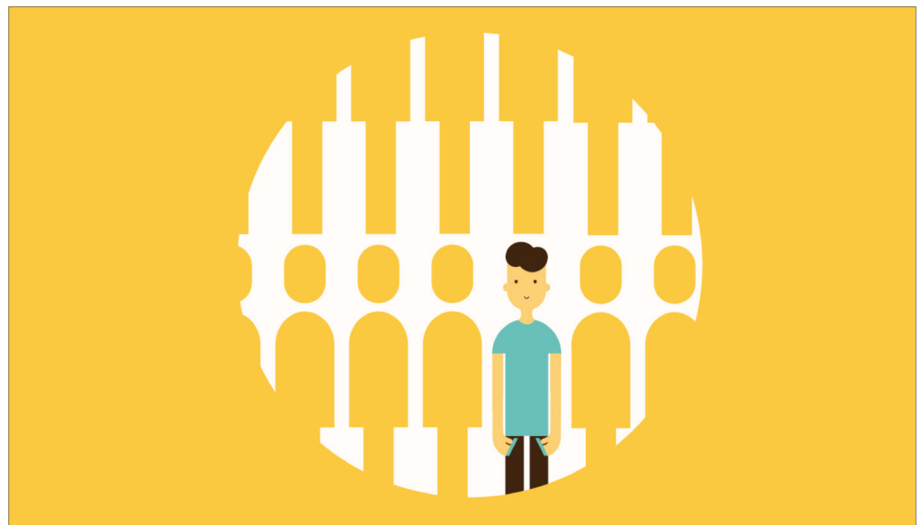


Figure 11

The first few days were the most difficult. Figure 12



Figure 12

Unfortunately, I was diagnosed with Diabetic Ketoacidosis. Figure 13



Figure 13

Ketones made me very sick! Figure 14

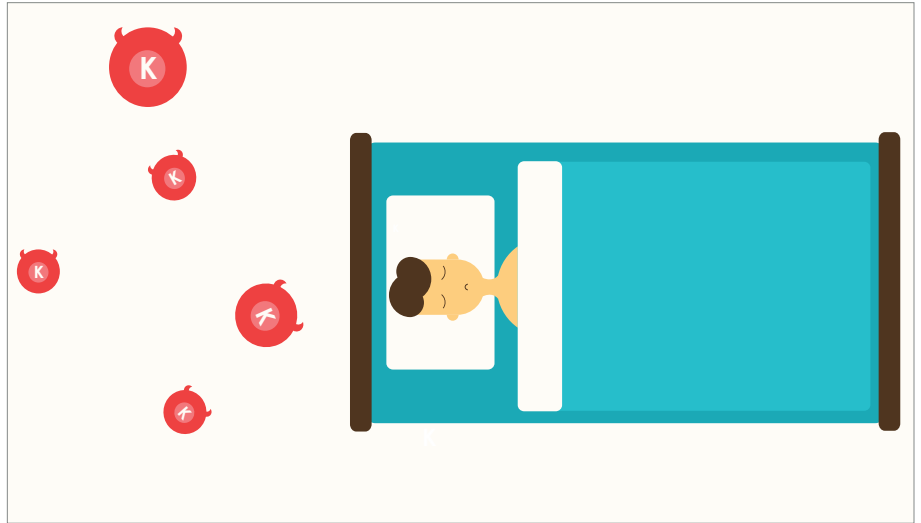


Figure 14

DKA occurs when my cells can't get the energy they need from glucose. Figure 15



Figure 15

My body begins to drain the energy away from muscle and fat making ketones, which become like poison to the body. Figure 16



Figure 16

They build up in the blood and are passed in the urine. Figure 17

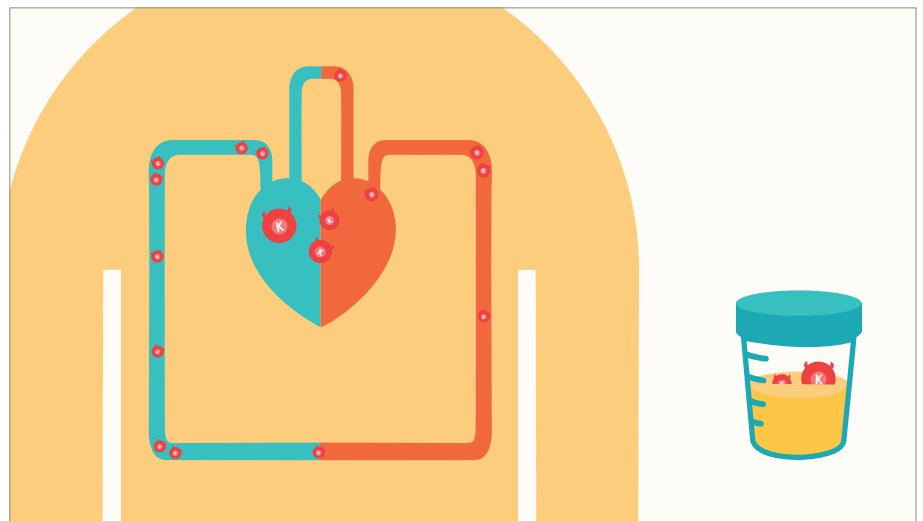


Figure 17

Eventually, I recovered from DKA. After that, a new trial awaited me. Figure 18

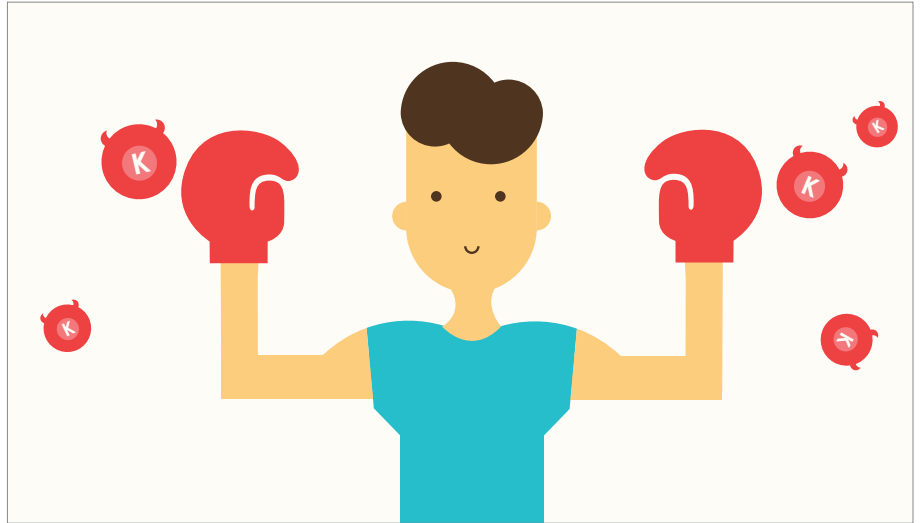


Figure 18

Not only do I have to worry about high blood sugar, I also have to worry about low blood sugar. Figure 19

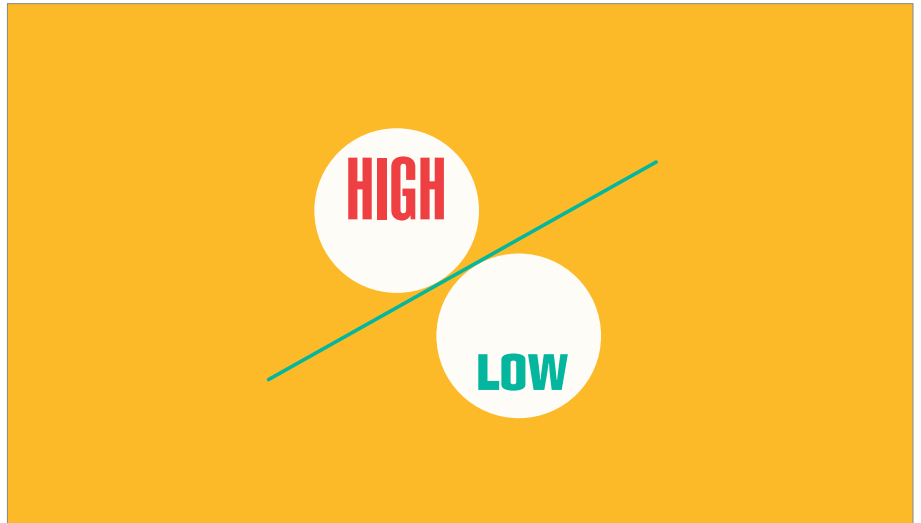


Figure 19

I was learning how to drive last year. One day, I forgot to eat my snacks on time. Figure 20, Figure 21



Figure 20

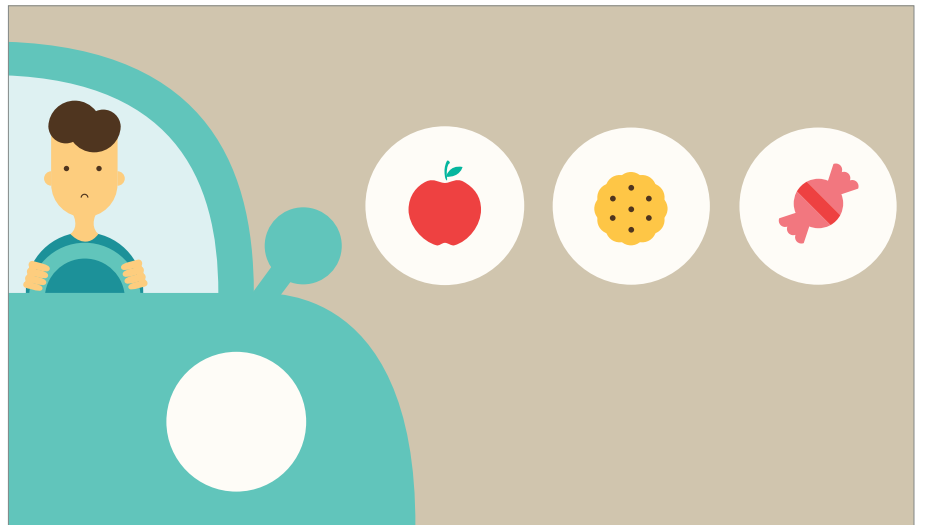


Figure 21



I was driving a car just like a drunk person. Figure 22

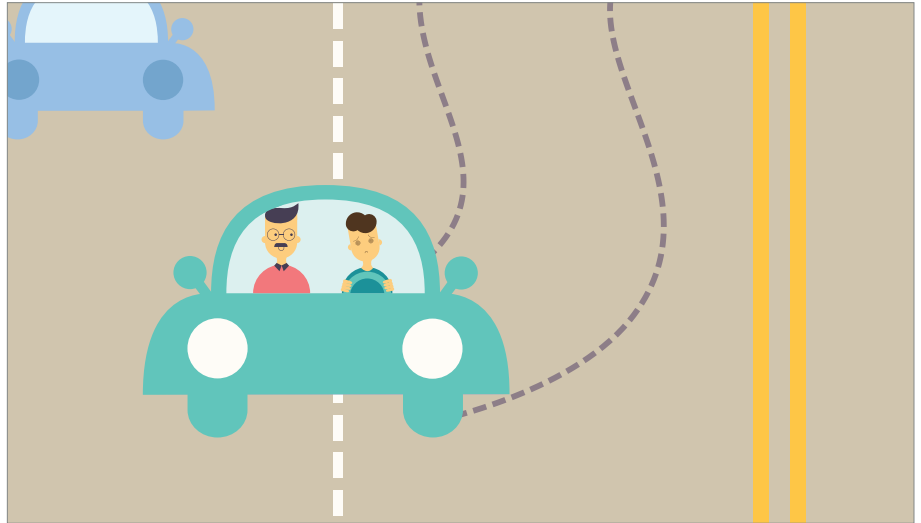


Figure 22

Thanks to my instructor sitting beside me, I avoided having an accident. Figure 23



Figure 23

I learned that I should always have sugar with me. From now on, I would handle these situations better. Figure 24

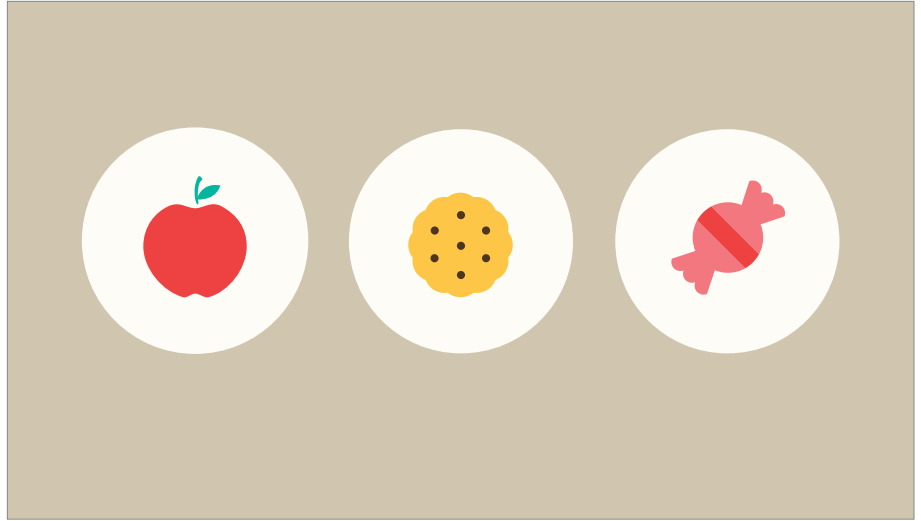


Figure 24

No sadness! No fear! Figure 25



Figure 25

I am going to control diabetes and not let it control me!! Figure 26, Figure 27



**I am** going to  
**control**  
**Diabetes**

Figure 26



**not**  
**let it**  
**control**  
**me**

Figure 27

Now I am maintaining good sugar control. I can do this through food, insulin, testing and exercise. I am even using an alarm watch to remind me. Figure 28

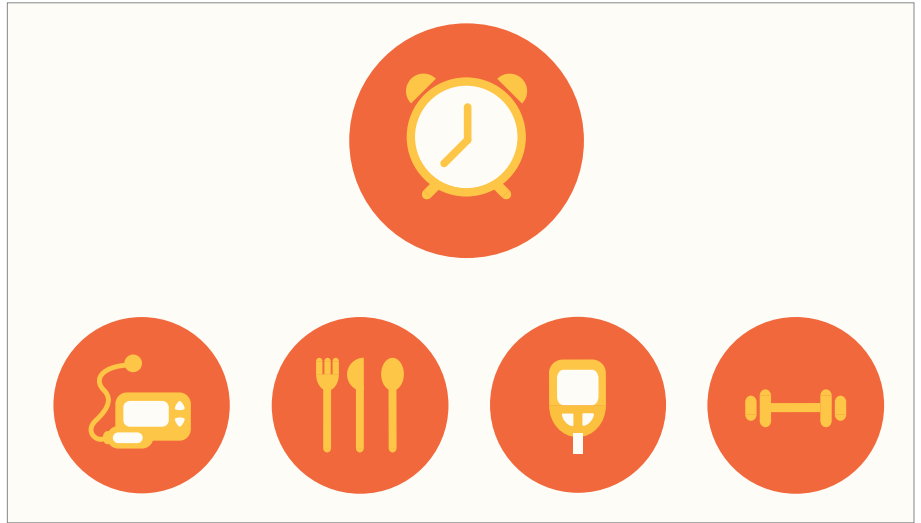


Figure 28

In addition to talking with other teens in diabetes camp, I also talk to my family, doctors, nurses, and teachers about my situation and feelings, both in person and online. Figure 29, Figure 30, Figure 31

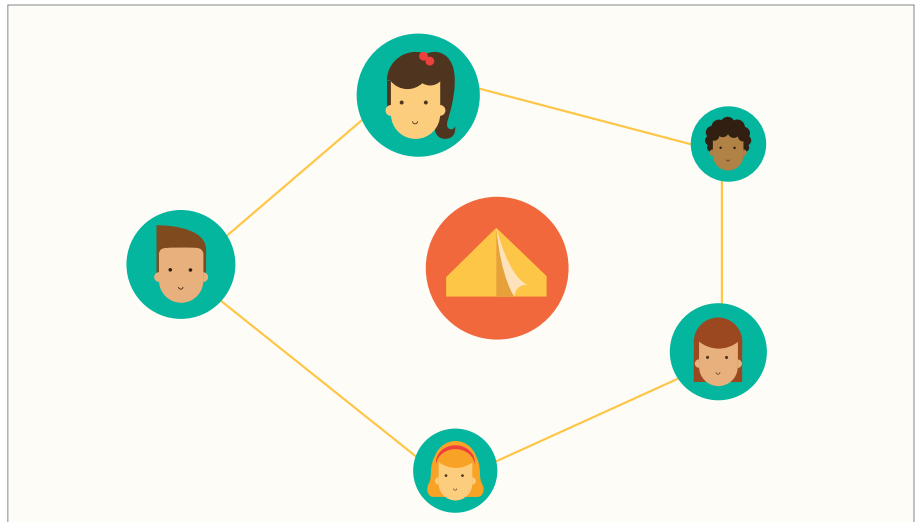


Figure 29

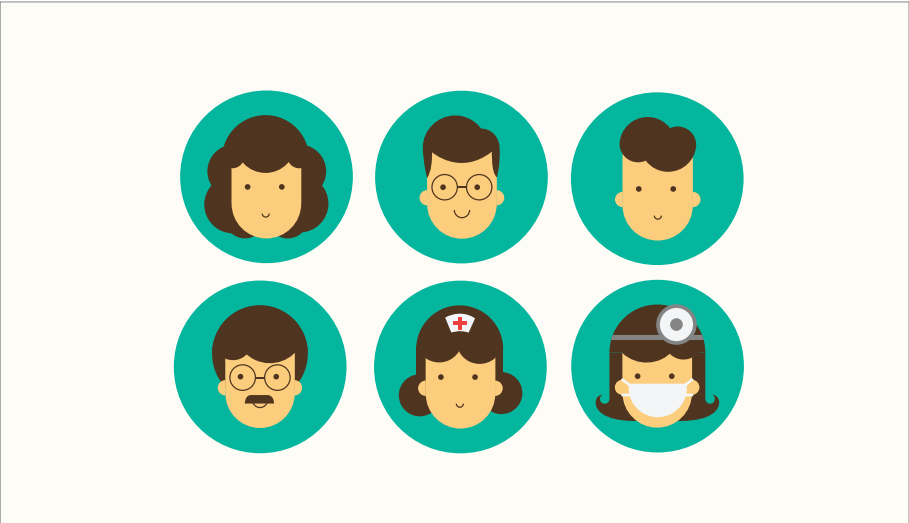


Figure 30

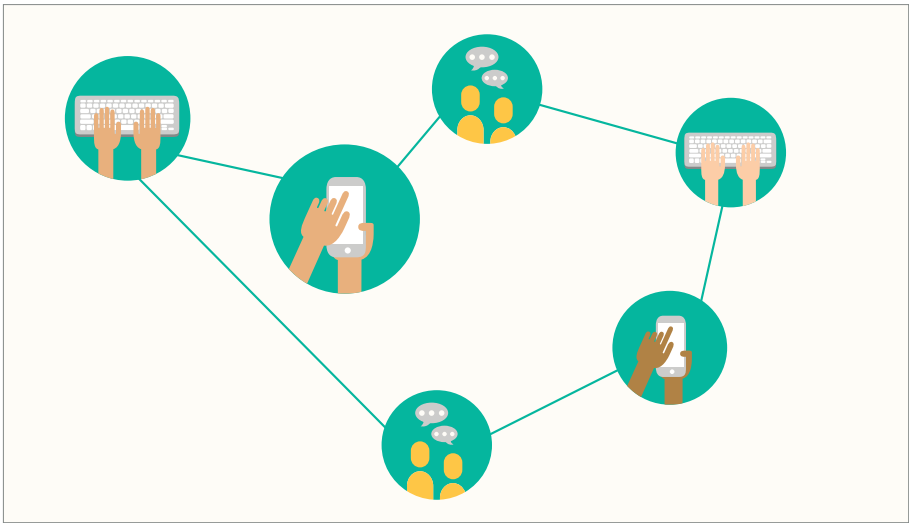


Figure 31

Getting their support makes me feel much more confident about controlling my sugar. Figure 32

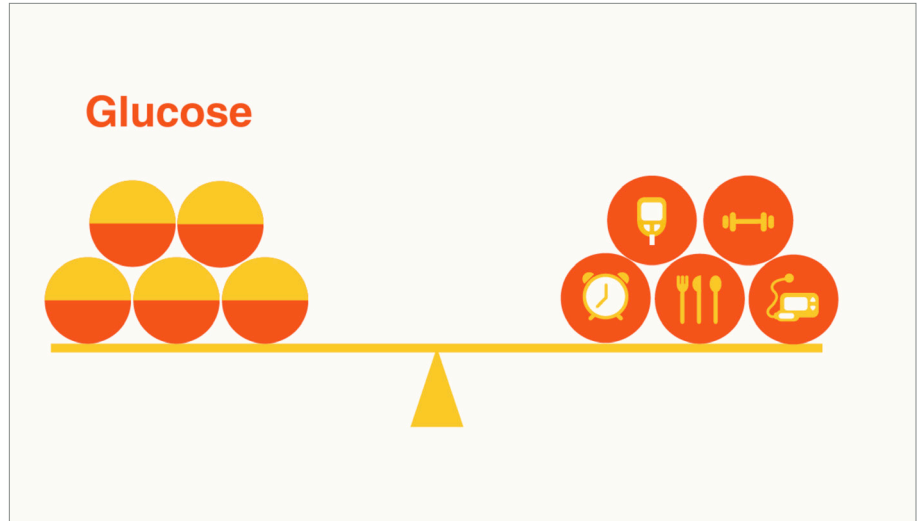


Figure 32

No sadness! No fear! Figure 33



Figure 33

We can control diabetes and not let it control us! Figure 34, Figure 35



Figure 34



Figure 35

We can feel like everyone else and have a wonderful life. Figure 36, Figure 37

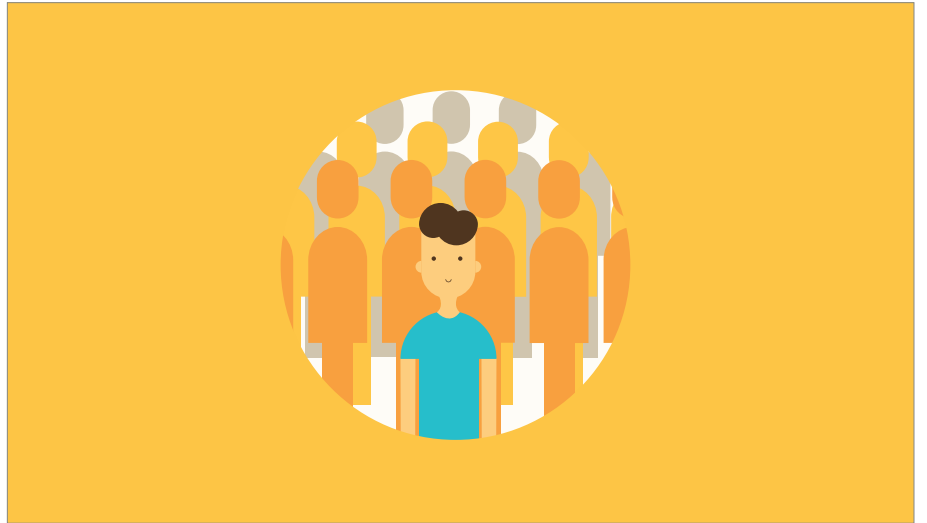


Figure 36



Figure 37



# In After Effects

After designing the full storyboard in Adobe Illustrator, the author started to build the motion graphics in Adobe After Effects, which was a huge challenge for her. She not only needed to think about how to make the animation dynamic and attractive, but also needed to think about how to control different transformations by adjusting timing appropriately. Sequencing, speeding, and fluency are the main aspects for this time-based project. Figure 1 – Figure 18

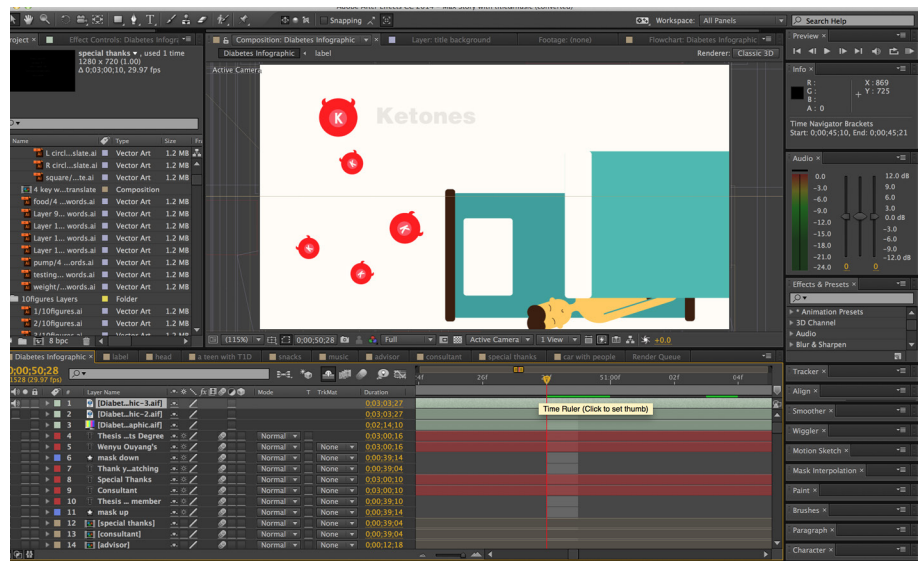


Figure 1

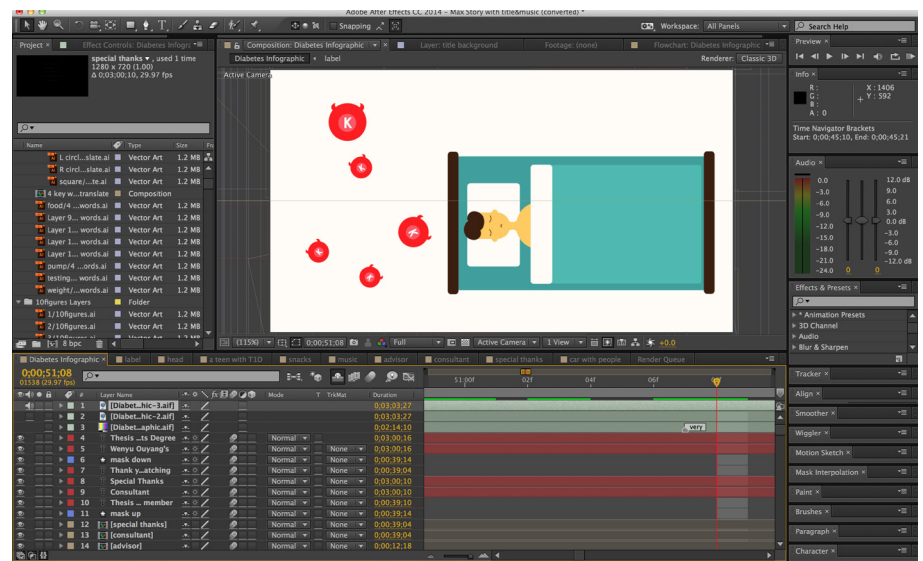


Figure 2

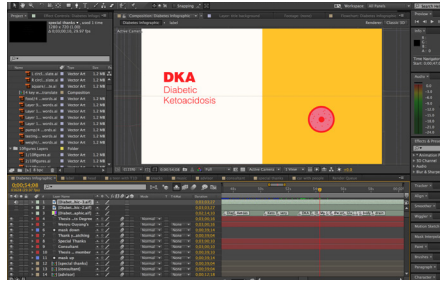


Figure 3

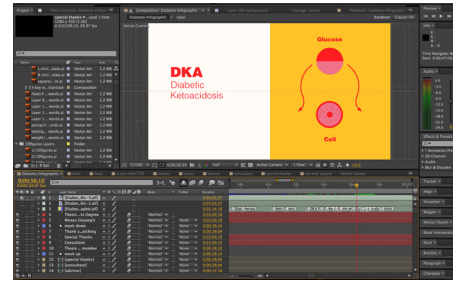


Figure 4

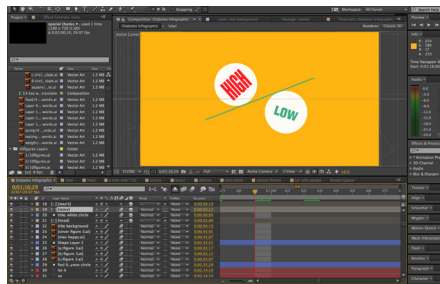


Figure 5

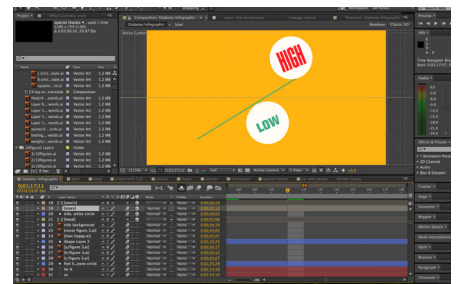


Figure 6

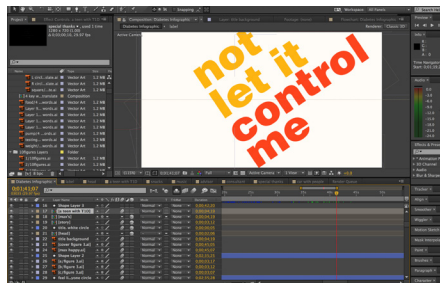


Figure 7

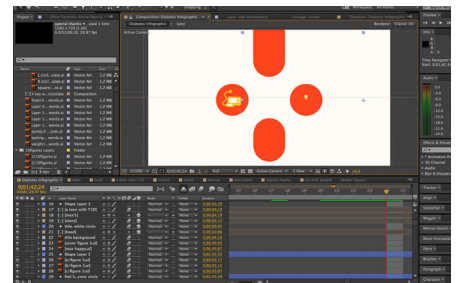


Figure 8

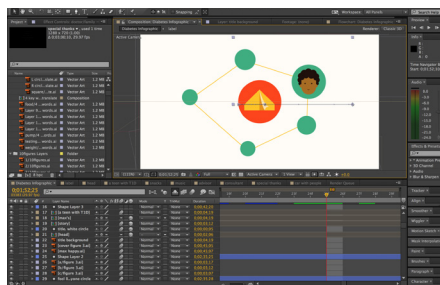


Figure 9

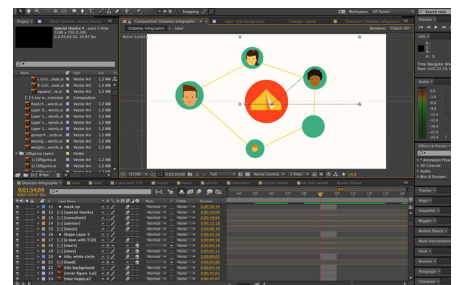


Figure 10

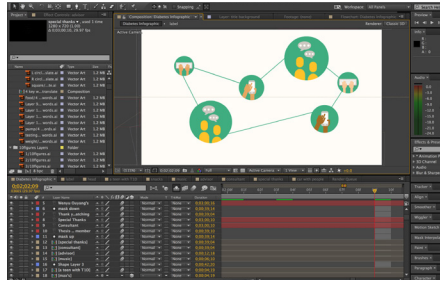


Figure 3

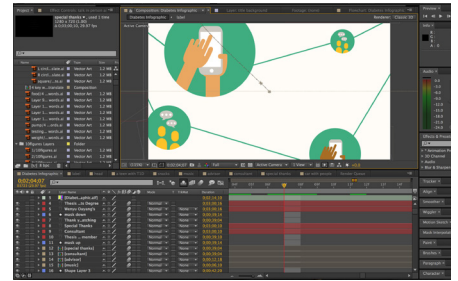


Figure 4

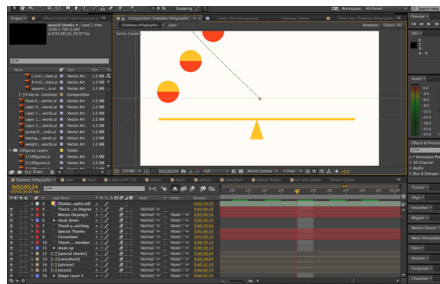


Figure 5

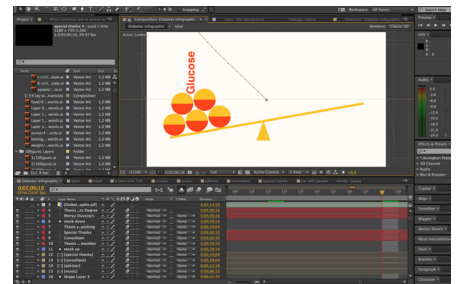


Figure 6

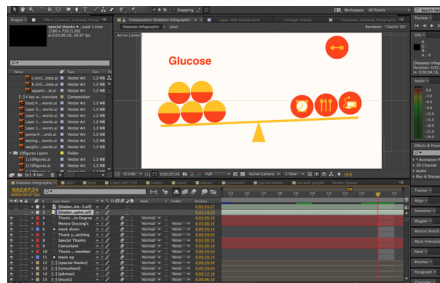


Figure 7

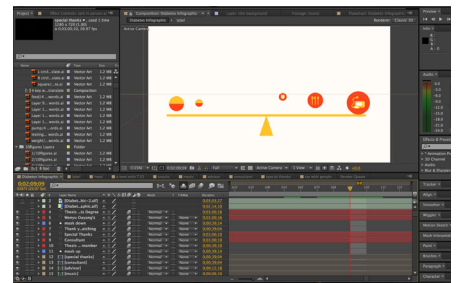


Figure 8

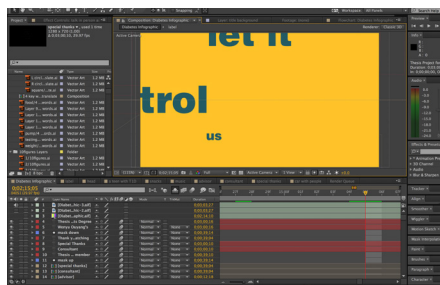


Figure 9

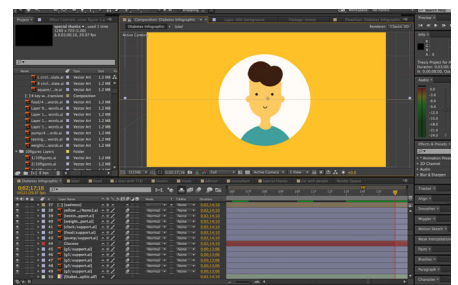


Figure 10

# Summary

# Evaluation Survey

There are two phases for the survey. Phase one, the author took part in ImagineRIT on May 3, 2014 at RIT James E. Booth Hall, and she interviewed 17 people. Phase two, the author was invited to join the Juvenile Diabetes Research Foundation (JDRF) Walk to Cure Diabetes event on May 18, 2014, held in Rochester NY, and she interviewed 13 people. The survey focused on the storyboard and final motion graphics of Max's Story. Over all, 16 teenagers and 14 adults were interviewed. There were 7 patients and 23 healthy people among them. Google Drive was used to edit the survey. Participants need to spend 5 minutes on the survey. With interviewing the participants and asking them to fill in the digital survey on iPad, finally received satisfied answers.

## Survey

Participants: 30

### How old are you?

12 –14	1	3%
15 –17	6	20%
18 –20	9	30%
older than 21	14	47%

### Are you living with Type 1 Diabetes?

Yes	7	23%
No	23	77%

### What do you think of the visual style of Max's storyboard?

Don't like	0	0%
Not bad	1	3%
Good	12	40%
Excellent	17	57%

### What do you think of the color palette of Max's storyboard?

Don't like	1	3%
Not bad	0	0%
Good	11	37%
Excellent	18	60%

**Can you understand the visual elements' meaning of Max's storyboard, such as symbols and diagrams?**

Yes	26	87%
No	0	0%
Not Sure	4	13%

**Would you watch the whole video if it is two and a half minutes?**

Yes	26	87%
No	1	3%
Not sure	3	10%

**How do you like the motion graphics?**

Don't like	0	0%
Not really	4	13%
Very Like	26	87%

**Do you understand the information in Max's Story?**

Yes	29	97%
No	0	0%
Not Sure	1	3%

**Do you agree this is a good way to educate newly diagnosed teenagers with T1D to learn about T1D?**

Yes	28	94%
No	0	0%
Not Sure	2	6%

**Do you think Max's story has positive impact for T1D?**

Yes	29	97%
No	0	0%
Not sure	1	3%

# Dissemination

The author got positive feedback from a varied audience when she took part in Imagine RIT on May 3, 2014 at RIT James E. Booth Hall. After the project was done, the author was invited to show her project at JDRF Walk to Cure Diabetes event on May 18, 2014, held in Rochester NY. She shared her project with people who were diagnosed with T1D and their families. Also, this project was presented by Professor Bruce Ian Meader at Medicine + Design Healthcare and Wellness Conference on November 7 and 8, 2014, hosted by the Vignelli Center at Rochester Institute of Technology.

The printed copies of the thesis documentation will be provided to the RIT Archives and the School of Design program as well as submitted electronically to the RIT Archives and ProQuest/UMI. In the future, the author will submit her finished project to design competitions such as HKDA Global Design Awards, D&AD Professional Awards and 365: AIGA Annual Design Competition. Also, she will publish the thesis documentation on a design journal. Last but not least, she will keep in touch with JDRF, and allow more patients to watch her video and benefit from it.

# Conclusion

The author has a strong sense of social responsibility, and she wants to design for the public good. Today, some younger people are suffering from chronic illnesses such as diabetes, leukemia, and depressive disorder, which are some of the most significant concerns in the world. The younger generation will be the main force for a country's development and future, and so that is where the author wants to have an impact. In spite of advancements made by science and technology, some chronic illnesses still last a lifetime, such as T1D. In this situation, positive attitudes and correct understanding become really important.

In order to encourage teenagers to learn about T1D and manage their daily life with a positive attitude, the author developed motion graphics. First, she reads some books to understand T1D, find out what are the most important things for newly diagnosed teenagers to learn. Secondly, she has also researched information design, graphic design and motion graphics design to help her find out what is the best design solution for teenagers. Thirdly, she interviewed experts and organizations several times to make sure her information was correct and made sense. She has evaluated her storyboard and motion graphics to find out what the audience thinks about it. Finally, she has created understandable and visually interesting motion graphics for teenagers with T1D. With this a two and a half minute long "Max's story", audiences can learn about how to get rid of the negative feeling, what happens when you do not control your blood sugar, and how to control your blood sugar.

Overall, the thesis is a good trial to combine educational information and motion graphics in a teenage-friendly way to convey important information. At the same time, it could become a successful case for using information design to show issues of reality. Using colorful and systematic symbols, diagrams, illustrations, and characters to build a motion graphics, one can have really good educational results. The project received recognition and was commended at the JDRF Walk to Cure Diabetes event on May 18, 2014, held in Rochester NY, and at Medicine + Design Healthcare and Wellness Conference on November 7 and 8, 2014, hosted by Vignelli Center at Rochester Institute of Technology. The significance and impact of the project was achieved through presenting it to the participants and sponsors at the two events.



# Appendix

# **Appendix I**

## Thesis Proposal



# **Information Design For Children**

A Guidebook & An Application  
On Multi-touch Tablet Devices  
For Children With Diabetes

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**Wenyu Ouyang**

Thesis Defense for the Master of Fine Arts Degree  
Visual Communication Design  
Rochester Institute of Technology  
College of Imaging Arts and Sciences  
School of Design

**Title**

**Information Design for Children: A Guidebook & An Application  
On Multi-touch Tablet Devices For Children With Diabetes**

**Thesis  
Committee  
Approval**

Chief Advisor  
Associate Professor Nancy Ciolek  
Visual Communication Design  
Date

---

Associate Advisor  
Professor Bruce Ian Meader  
Visual Communication Design  
Date

---

Associate Advisor  
Associate Professor Lorrie Frear  
Visual Communication Design  
Date

---

Associate Advisor  
Professor Chris Jackson  
Visual Communication Design  
Date

---

# Introduction

# Introduction

## Situation Analysis

Health is one of the most important topics of discussion in recent years, especially children's health problems. The younger generation will be the main force for a country's development and future. It is obvious that some chronic illnesses such as diabetes, lead into this with something about educating people to manage the condition is more important than ever. At present, there are some good designs for diabetes patients such as book design and a few applications on tablet devices.

It is good to know that there are many books about diabetes for children. There are some picture books, which have nice illustrations inside such as *The Great Katie Kate Discusses Diabetes*<sup>1</sup> and *Taking Diabetes to School (Special Kids in Schools Series)*<sup>2</sup>. These color illustration books are for children ages 4 to 8 years old and grade-schoolers with diabetes. There are some workbooks on Diabetes for children too. For example, *It's Time To Learn About Diabetes: A Workbook on Diabetes for Children* is an entertaining and easy-to-use guide, which helps children age 8 to 10 manage their diabetes in simple terms, and let grade-schooler know how to take care of themselves.<sup>3</sup> The majority of books about diabetes are for adults to read. For instance, *The Everything Parent's Guide To Children With Juvenile Diabetes: Reassuring Advice for Managing Symptoms and Raising a Happy, Healthy Child*<sup>4</sup> informs parents what to do when their children are diagnosed with diabetes.

In the interactive design field, some apps provide an introduction to diabetes, some help Diabetes patients to get a better handle on their blood sugar control, and some are digital cookbooks helping people to solve their everyday problem of healthy meal selection. The *Animated Pocket Dictionary of Diabetes* is a quick, handy, and visually compelling medical reference. The app has more than 100 diabetes and medical terms defined and illustrated using life-like 3D animation. It has short videos less than 1 minute to descriptive 3D illustration animations with a clear narration for each term.<sup>5</sup> *Diabetes Buddy-Control Your Blood Sugar* is a digital assistant managing blood sugar for Diabetes patients. It not only tracks the daily carb intake, weight, blood sugar, activity level and medicine intake, but also has a database of more than 20,000 foods for you to make food choices.<sup>6</sup>

In summary, there are picture books and workbooks about diabetes for children to read by themselves. But there is a lack of well-developed apps directed toward children who have diabetes. The majority of apps about diabetes are not child-friendly. For the average child, professional medical knowledge is too difficult to understand. Medical illustrations are often too realistic and graphic for children and the information design in these apps is complicated.

- 
- 1 M. Maitand Deland MD and Jennifer Zivoioin, *The Great Katie Kate Discusses Diabetes* (Greenleaf Book Group Press, 2010)
  - 2 Kim Gosselin and Moss Freedman, *Taking Diabetes to School, Special Kids in Schools Series* (JayJo Books, 2004)
  - 3 Jean Betschart-Roemer, *It's Time To Learn About Diabetes: A Workbook on Diabetes for Children* (Wiley, 1995)
  - 4 Moira McCarthy and Jake Kushner, *The Everything Parent's Guide To Children With Juvenile Diabetes: Reassuring Advice for Managing Symptoms and Raising a Happy, Healthy Child* (Adams Media, 2007)
  - 5 *Diabetes (Animated Pocket Dictionary series) Focus Apps* by Expanded Apps, accessed October 21, 2013, <https://itunes.apple.com/us/app/diabetes-animated-pocket-dictionary/id441879644?mt=8>
  - 6 *Diabetes App - blood sugar control, glucose tracker and carb counter* by BHI Technologies, Inc., accessed October 21, 2013, <http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>

**Problem Statement**

Can an interactive application and guidebook be developed to assist children who are diagnosed with diabetes and are between the ages 8 to 12 learn about their illnesses? Can the introduction of diabetes as an illness, control of blood sugar and diabetic diet choices be integrated in one interactive application and guidebook directed towards children? Can it teach children how to manage their daily lives and have confidence in their health?

There is no doubt that there are some excellent picture books that tell the story with leading characters about how to control their diabetes. It is a good way to tell children they do not need to be afraid of diabetes, and they can manage their condition by themselves. However, these picture books are designed for children ages 2 to 8 to read. So quite a lot of information in these books is very basic and simple. For kids age 8 to 12, these books maybe too simple. Also, they cannot give children with diabetes a place to interact, such as tracking the daily carb intake, weight, blood sugar, activity level and medicine intake. *It's Time to Learn About Diabetes: A Workbook on Diabetes for Children* is a good book for children in this age group. It has some specific sections in the book for children to write and draw. It does have an interactive activity. But the pictures in the book look like sketches. What's more, they are black and white. Children may feel less interested in this kind of book.

There are some interactive apps about diabetes. But all of them are directed toward an adult audience. Some of the apps are difficult even for the medical professionals and students to use. This kind of app is too detailed for children to understand. The medical illustration and life-like 3D animation are not suitable for children. In addition, some apps for helping control blood sugar are easy to use. But for children, the color system and icon system are a little bit serious and formal.

To solve these problems, I will design a guidebook and an app to assist children ages 8 to 12 diagnosed with diabetes. Both of them will include an introduction to diabetes, information on helping control blood sugar and diabetic diet choices. Children will learn how to manage their daily life and have confidence in their health. First of all, they will have specific information designed to help them to learn about their illness, such as why they are ill, what type of illness, symptoms, methods of treatment, and healthy lifestyles to battle the effects of the illness. Secondly, the app will become a digital assistant for tracking children's daily blood sugar, activity level, medicine intake and so on. Thirdly, they will teach children how to choose their food in a reasonable way. These graphics will utilize the principles of design. I will also be taking into consideration medical pictograms and flow charts of information as well as the differing aspects of using digital applications versus their traditional printed counterparts.

# **Review of Literature**



# Review of Literature

## Introduction

My research focuses on how to build a print guidebook and a digital application to help children ages 8 to 12 to learn about Diabetes.

I started gathering information on diabetes from books that target different age groups. I also focused on human anatomy and physiology to better explain medical knowledge to children. In addition, I read some books about information design and graphic design principles that include symbols, diagrams, pictograms, characters, color, layout, typeface and grid systems. Last but not least, I explored some books about interface design and interactive design.

## Sources

### Diabetes and Medical Information

#### 1 **A First Book For Understanding Diabetes**

H. Peter Chase  
Novo Nordisk, 2008

This book helps people learn about diabetes at an early age. It is designed for children to learn with the assistance of an adult. It helps readers learn the basic knowledge of diabetes. It teaches reader how to manage diabetes no matter what patients circumstances are or their phase of life.

#### 2 **It's Time To Learn About Diabetes: A Workbook On Diabetes For Children**

Jean Betschart-Roemer  
Wiley, 1995

This book is an easy-to-use guide that explains diabetes in simple terms. It helps school-age children to learn about what's happening in their bodies. It shows children how to control their diabetes and feel good about themselves. It also has some exercises at the end of each chapter helping children review what they learned.

#### 3 **The Everything Parent's Guide To Children With Juvenile Diabetes: Reassuring Advice For Managing Symptoms and Raising a Happy, Healthy Child**

Moira McCarthy and Jake Kushner  
Adams Media, 2007

This book has comprehensive information for parents who have to raise a child with diabetes. The guide features advice on adjusting to life with diabetes, helping children take control of their health, monitoring diet and insulin levels, handling emergencies and finding support for parents and children.

#### **4 The Great Katie Kate Discusses Diabetes**

M. Maitand Deland MD and Jennifer Zivoin  
Greenleaf Book Group Press, 2010

This is a picture book for six years and older children to read. It has two main characters, Andrew, diagnosed with diabetes, and Katie Kate, a super hero who magically appears. Katie Kate introduces Andrew to other kids who also have diabetes, and takes him inside the human body to explain what's going on with him. With the knowledge of controlling diabetes, Andrew is no longer worried about his chronic illness.

#### **5 An Introduction to Human Disease Pathology and Pathophysiology Correlations**

Leonard V. Crowley, M.D.  
Jones and Bartlett Publishers, 2007

This book is designed for the introductory college level. The "Pancreas and Diabetes Mellitus" chapter provides a clear and well-illustrated explanation of the structure and function of the pancreas as well as biochemical disturbances in diabetes. It was helpful for me to understand the pathological knowledge of diabetes.

### **Design Information**

#### **1 Designing Information: Human factors and Common Sense In Information Design**

Joel Katz  
John Wiley & Sons, Inc, 2012

This book is an essential and comprehensive guide to understanding information design and how to make it better. It shows plenty of examples about using line, color, and form appropriately, and how to explain complex data and information visually. It provides design principles and ways to communicate in a simple, honest and accessible form.

#### **2 Information Design Workbook: Graphic Approaches, Solutions, and Inspiration + 30 Case Studies**

Kim Baer  
Rockport, 2008

This is a workbook with a methodical and comprehensive approach to convey innovation information design. It is packed with useful tips, ideas and stories from not only the author but also from information designers and agencies around the world. It is a good resource to know how processes work, what their problems are, and how to create formal quality and high function design.

### **3 The Practical Guide to Information Design**

Ronnie Lipton  
John Wiley and Sons, Inc, 2007

This book, which covers the principles of design, perception, and usability, teaches designers how to design effectively and present content clearly. With step-by-step examples, the book analyzes the processes necessary to dissect large quantities of information logically, and organize it so readers can clearly utilize the information towards the intended goals.

### **4 100 Things Every Designer Needs to Know About People**

Susan Weinschenk  
New Riders, 2011

This book combines real science and research with practical examples to deliver a guide every designer needs. With it one will be able to design more intuitive and engaging work for print, websites, applications, and products that matches the way people think, work, and play.

### **5 Interactive Design: An Introduction to the Theory and Application of User-centered Design**

Andy Pratt, Jason Nunes

This book examines the user-centered design process from the perspective of a designer. With rich imagery, Interactive Design introduces the different UX players, outlines the user-centered design process from user research to user testing, and explains through various examples how user-centered design has been successfully integrated into the design process of a variety of design studios worldwide.

# Design Ideation

## Existing Application Design for Diabetes

### **iabetes App**

#### **Blood sugar control, glucose tracker and carb counter**

BHI Technologies, Inc. | October 21, 2013

<http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>

### **Diabetes App**

#### **Animated Pocket Dictionary Series**

Expanded Apps | October 21, 2013

<https://itunes.apple.com/us/app/diabetes-animated-pocket-dictionary/id441879644?mt=8>

### **iCookbook Diabetic App**

#### **Recipes and nutritional information plus health articles for people with diabetes**

Publications International, Ltd. | October 21, 2013

<https://itunes.apple.com/us/app/icookbook-diabetic-recipes/id541245203?mt=8c>

### **Diabetes App**

#### **eKnowledge - Diabetes: Lectures for Clinical P.**

Projects In Knowledge, Inc. | October 21, 2013

<https://itunes.apple.com/ca/app/eknowledge-diabetes-lectures/id424013592?mt=8>

## Existing Infographic Design for Health Issues

### **Fascinating Facts About the Human Brain**

October 21, 2013

<http://visual.ly/fascinating-facts-about-human-brain>

### **Children Hospital Icons**

October 21, 2013

<http://zhan.renren.com/>

**Existing Infographic Design  
for Diabetes**

**Weight Loss Leads to Diabetes Prevention**

Agcmahfuz | October 21, 2013

<http://visual.ly/weight-loss-leads-diabetes-prevention>

**Why type 2 diabetes in Australia is an issue**

Medibank | October 21, 2013

<http://visual.ly/why-type-2-diabetes-australia-issue>

**NCDs explained**

Morganlilli | October 21, 2013

<http://visual.ly/ncds-explained>

**Diabetes The Silent Epidemic**

USA | October 21, 2013

<http://visual.ly/diabetes-silent-epidemic>

**Existing Symbol Design  
for Health Issues**

**Children's Hospital Pictogram**

October 21, 2013

<http://webdesigneraid.com/40-amazing-examples-of-pictograms-for-your-inspiration/>

**Medical Icon - Color**

September 25, 2014

<http://www.shutterstock.com/pic159130799/stock-vector-medical-icon-colorhtml?src=sBdYOOI8vNvxnmNxKrE2yQ-1-14>

**Existing Website Design  
for Children**

**Fact Monster**

December 2, 2013

<http://www.factmonster.com/>

**Math, Language Arts, Science,  
and Social Studies Games for Kids**

December 2, 2013

<http://mrnussbaum.com/allgames/>

## Sketches for Symptoms of Diabetes

Figure 1, Figure 2

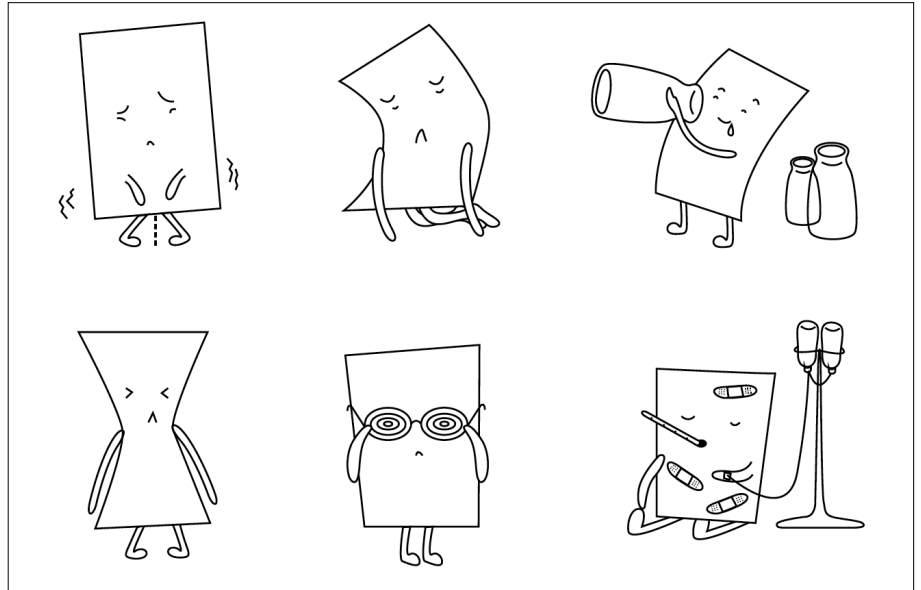


Figure 1: Sketch



Figure 2: Sketch

# Methodological Design

For my project, the final application involves a printed guidebook as well as a digital application for the Apple iPad.

I will develop this set to help children learn about Diabetes. After using the print guidebook and digital application, children will get good information of Diabetes. In order to implement my thesis I will be conducting research about learning intelligences for Juvenile Diabetes, app design, book design and information design. I will focus on information graphic design and interactive design.

I will use Adobe InDesign, Adobe Illustrator and Adobe After Effects to execute my project.

## **Target Audience**

This is a guidebook for children who are diagnosed with Diabetes, and may have a negative attitude toward their health issues. I will focus on children in United States aged 8 to 12, children who can read by themselves as well as read with parents.

Data from the 2011 National Diabetes Fact Sheet shows 25.8 million children and adults in the United States — 8.3% of the population — have diabetes. For people who under 20 years of age, 215,000, or 0.26% of all people in this age group have diabetes. About 1 in every 400 children and adolescents has diabetes. So I think children in United States really need to be able to easily access the information about this chronic illness.

## **Sections**

### **Introduction Section**

The introduction section will focus on what is diabetes, I will research diabetes, how many children have diabetes, how to explain diabetes in simple terms, showing children how to take care of themselves, how to take insulin shots and blood tests, and explain what is happening in their bodies.

### **Control Your Blood Sugar by Yourself Section**

This will enable children to manage their diabetes and get their blood sugar under control. In the printed guidebook, children can write their daily carb intake, weight, blood sugar, activity level and medicine intake. In the digital app, instead of crunching the numbers by themselves, this section in the app will be a digital assistant to help children to track their data. When they



# Implementation Strategies

This project requires an understanding of graphic design, information design, typography and interactive design. What is more, it will require research of diabetes.

As a visual communication design student, I am aware of the impact of responsive design in the world as a meaning of communication for multi-touch devices, has become the tendency. I think I should develop the digital app for multi-touch devices as the project will be at the forefront of the times. Since I am not as well-versed in coding and programming, I will only create the screen design (mark-up) for the app.

In summary, my background knowledge, passions, and hard work will help me to complete this challenging project.

# Dissemination

I will distribute my findings for future audience interaction by posting it on my blog. Also, printed copies will be left with the RIT Archives and the School of Design program as well as submit electronic copies to the RIT Archives and ProQuest/UMI.

Also, I will submit my finished project to major graphics design competitions such as HKDA Global Design Awards, D&AD Professional Awards and 365: AIGA Annual Design Competition.

What's more, I will take part in ImagineRIT in May, 2014. In this big event, I will get more feedback from a varied audience.

# Evaluation Plan

For the survey, I will do research about explaining diabetes to children, and I will also do additional research to explain difficult concepts to children using non-verbal visual language.

- Read related books and explore websites about diabetes, learn the human anatomy related to diabetes, especially those directed toward children.
- Evaluate existing digital/mobile apps on the subject to find out the benefits and how to improve them to create child-friendly apps.
- Watch videos about how to explain complicated issues to children.
- Read articles and Journals about design for children, to find out the child friendly color, shape, size, text and other visual elements.

For the usability testing, I will visit the Harley School, which is a private school in Rochester, NY. I will try to access permission from the school to present my design to children with diabetes in grades 3 to 7.

The first time, I will show them information design, which contains illustrations, symbols, diagrams and characters. I will obtain feedback from them through discussion to see what kind of non-verbal visual language they like, and then keep working on that visual explanation. After I finish the whole design, I will visit the school a second time to assess the color system, whether or not they can understand the information presented visually, and to assess if they prefer a book or downloadable app.

# Pragmatic Considerations

## **Budget**

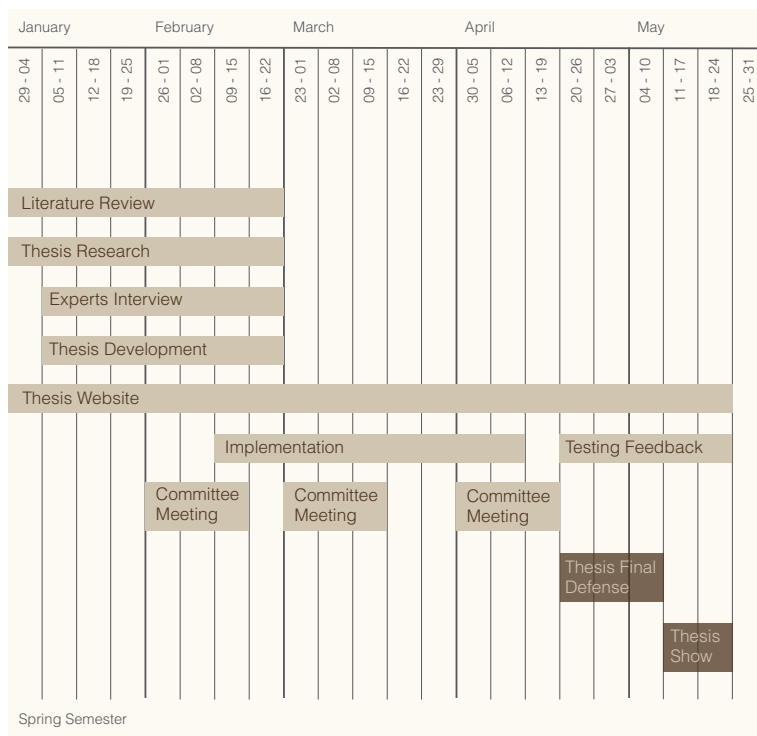
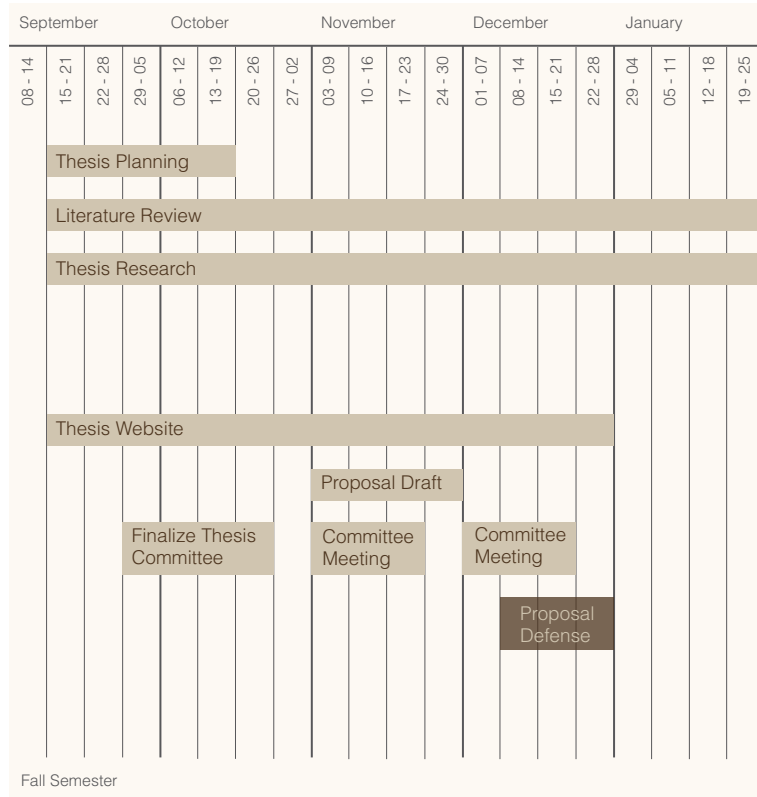
\$350 Thesis Show: Promotional posters, Guidebook, information cards for different chapters in guidebook, a big poster for specific content in the App, business cards

\$100 Thesis Publishing: Proposal Prints, Final bound copies

\$300 Travel fee: Go to different primary schools in Rochester.

\$750 Total

# Timeline



# Bibliography

## **Diabetes App**

### **Blood sugar control, glucose tracker and carb counter**

BHI Technologies, Inc. | October 21, 2013

<http://www.healthline.com/health-slideshow/top-iphone-android-apps-diabetes#7>

## **Diabetes App**

### **Animated Pocket Dictionary Series**

Expanded Apps | October 21, 2013

<https://itunes.apple.com/us/app/diabetes-animated-pocket-dictionary/id441879644?mt=8>

## **iCookbook Diabetic App**

### **Recipes and nutritional information plus health articles for people with diabetes**

Publications International, Ltd. | October 21, 2013

<https://itunes.apple.com/us/app/icookbook-diabetic-recipes/id541245203?mt=8c>

## **Diabetes App**

### **eKnowledge - Diabetes: Lectures for Clinical P.**

Projects In Knowledge, Inc. | October 21, 2013

<https://itunes.apple.com/ca/app/eknowledge-diabetes-lectures/id424013592?mt=8>

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Morganlilli | October 21, 2013

<http://visual.ly/ncds-explained>

## **Diabetes The Silent Epidemic**

USA | October 21, 2013

<http://visual.ly/diabetes-silent-epidemic>

## **Weight Loss Leads to Diabetes Prevention**

Agcmahfuz | October 21, 2013

<http://visual.ly/weight-loss-leads-diabetes-prevention>

## **Fascinating Facts About the Human Brain**

October 21, 2013

<http://visual.ly/fascinating-facts-about-human-brain>

### **The Children Hospital Wayfinding System**

October 21, 2013

<http://www.behance.net/gallery/The-Children-Hospital-Wayfinding-System/151615>

### **Pictogramas**

October 21, 2013

<http://webdesigneraid.com/40-amazing-examples-of-pictograms-for-your-inspiration/>

### **Children's Hospital Pictogram**

October 21, 2013

<http://webdesigneraid.com/40-amazing-examples-of-pictograms-for-your-inspiration/>

### **Children Hospital Icons**

October 21, 2013

<http://zhan.renren.com/szmccann?gid=3602888498042341150&checked=true>

### **Fact Monster**

December 2, 2013

<http://www.factmonster.com/>

### **Math, Language Arts, Science, and Social Studies Games for Kids**

December 2, 2013

<http://mnrussbaum.com/allgames/>

# **Appendix II**

Narration



Hi, I am Max, and this is my story.

In 2010, when I was 13, I was first diagnosed with Type 1 Diabetes. I could not believe it! I'm one of the 3,000,000 people who have Type 1 Diabetes in the United States. I felt shocked, sad, and afraid. Especially when I learned high blood sugar may have serious complications, such as blindness, heart attack, kidney failure, nerve damage and even amputations.

After I knew that approximately 80 people per day are diagnosed with Type 1 Diabetes in the United States, I felt a little bit better because I knew I was not alone.

The first few days were the most difficult. Unfortunately, I was diagnosed with Diabetic Ketoacidosis. Ketones made me very sick! DKA occurs when my cells can't get the energy they need from glucose, and my body begins to drain the energy away from muscle and fat making ketones, which become like poison to the body. They build up in the blood and are passed in the urine. Eventually, I recovered from DKA. After that, a new trial awaited me.

Not only I have to worry about high blood sugar, I also have to worry about low blood sugar. I was learning how to drive last year. One day, I forgot to eat my snacks on time. I was driving a car just like a drunk person. Thanks to my instructor sitting beside me, I avoided having an accident, and I learned that I should always have sugar with me.

From now on, I would handle these situations better. No sadness! No fear! I am going to control diabetes and not let it control me!! Now I am maintaining good sugar control. I can do this through food, insulin, testing and exercise. I am even using an alarm watch to remind.

In addition to talking with other teens in Diabetes camp, I also talk to my family, doctors, nurses, and teachers about my situation and feelings, both in person and online. Getting their support makes me feel much more confident about controlling my sugar.

No sadness! No fear! We can control diabetes and not let it control us!! We can feel like everyone else and have a wonderful life.

# **Appendix III**

Music

The music was composed by Dylan Price, who is an alumnus at Eastman School of Music.

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