Mobile Phone Asthma Action Plan Application; Use in Adolescents

LAURA ODOM, DNP, FNP-BC

MARCH 30, 2016

Sigma Theta Tau International
IOTA CHAPTER – VANDERBILT UNIVERSITY

THE UNIVERSITY OF TENNESSEE KNOXVILLE

Introduction

- Asthma is a chronic disease of the airways and a significant public health problem
- Written asthma action plans are standard of care but are often not done (Global Initiative for Asthma, 2012).
- The purpose of this project was the creation of an asthma action plan application for use in adolescents.
  - Improved accessibility
  - Improved utilization
  - Simplify asthma care for providers and patients

Background

Asthma burden affects mortality, morbidity, quality of life, and the economy.

- Mortality
  - 3,300 deaths in the United States in 2011 (CDC, 2014)
  - 80% increase in death rate over last 30 years in children (AAFA, 2014)
- Morbidity
  - 3 out of 5 children with asthma experience recurrent asthma symptoms (Federal Interagency Forum on Child and Family Statistics, 2012).
  - Incidence of asthma increased by 15% over the last decade (CDC, 2014).

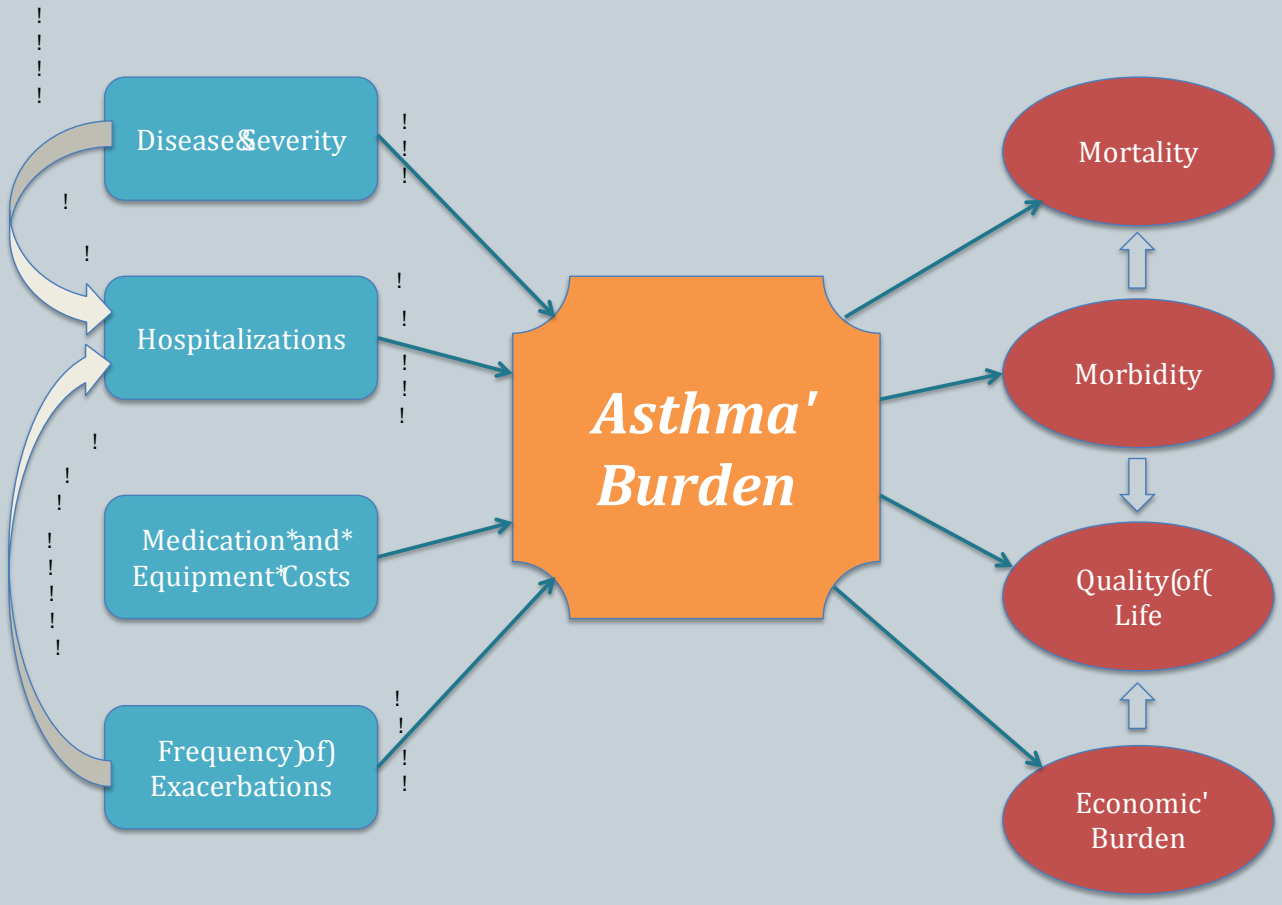
Background

- Quality of Life
  - 2 million emergency department visits each year
  - 25% of total ER visits (CDC National Ambulatory Survey, 2011).
  - Leading cause of school absenteeism (AAFA, 2014).
- Economy
  - Asthma direct cost is >$50 billion (CDC Vital Statistics, 2014).
  - Indirect asthma cost additional $5.9 billion (American Lung Association, 2012).

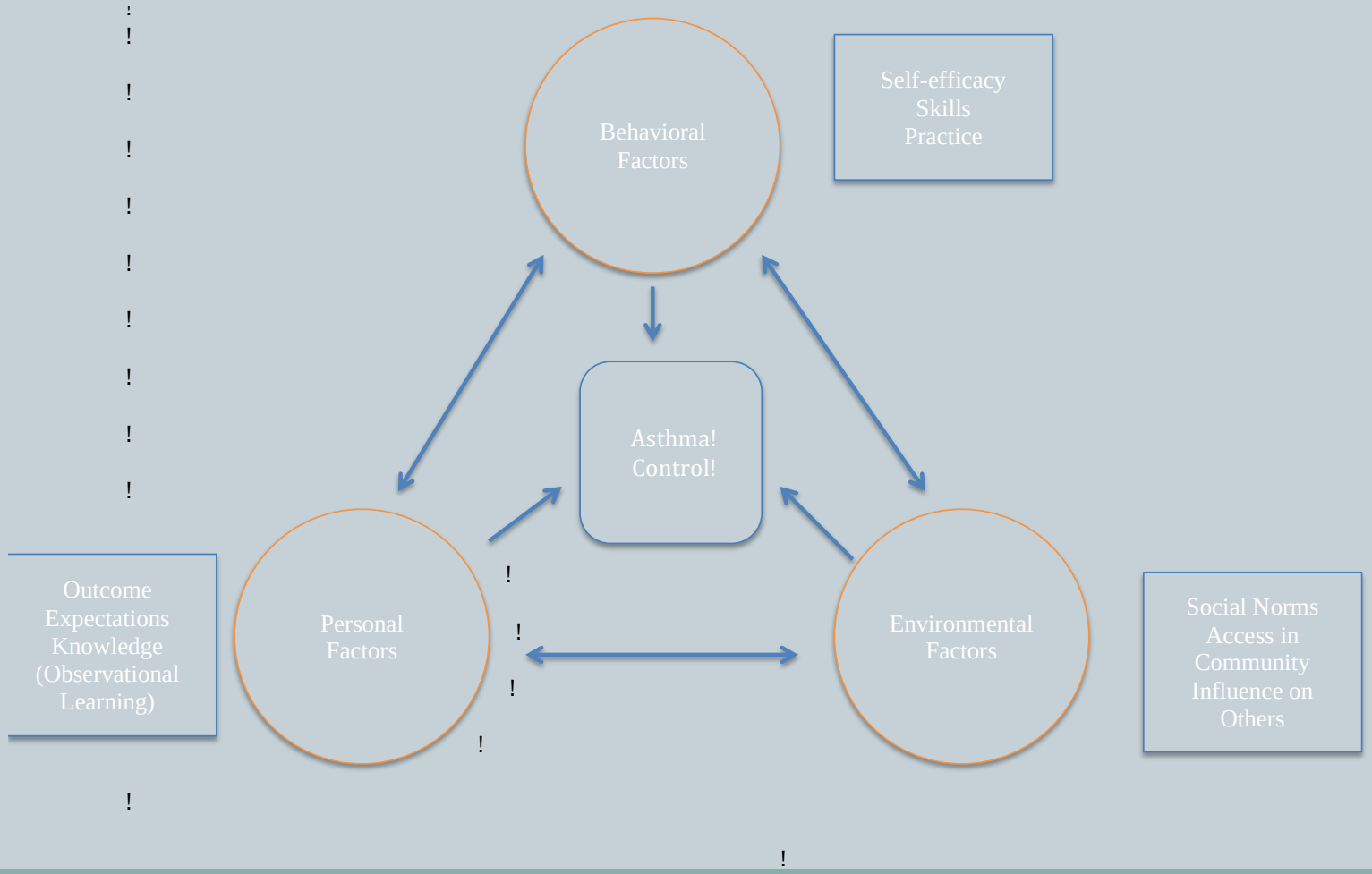
Synthesis of Evidence

- The *British Medical Journal* found that two thirds of deaths from asthma are preventable (Torjesen, 2014).
- Written action plans are widely recommended by health care providers but inconsistently used by patients (Andrews, 2014).
- ***At the project site, the asthma action plan utilization rate was 1.3%*** *(n=1,162)*
- Most cited reason for lack of asthma action plan was TIME (Tolomeo, 2014)

Concept


Disease Severity
Hospitalizations
Medication and Equipment Costs
Frequency of Exacerbations
Asthma' Burden
Mortality
Morbidity
Quality of Life
Economic' Burden

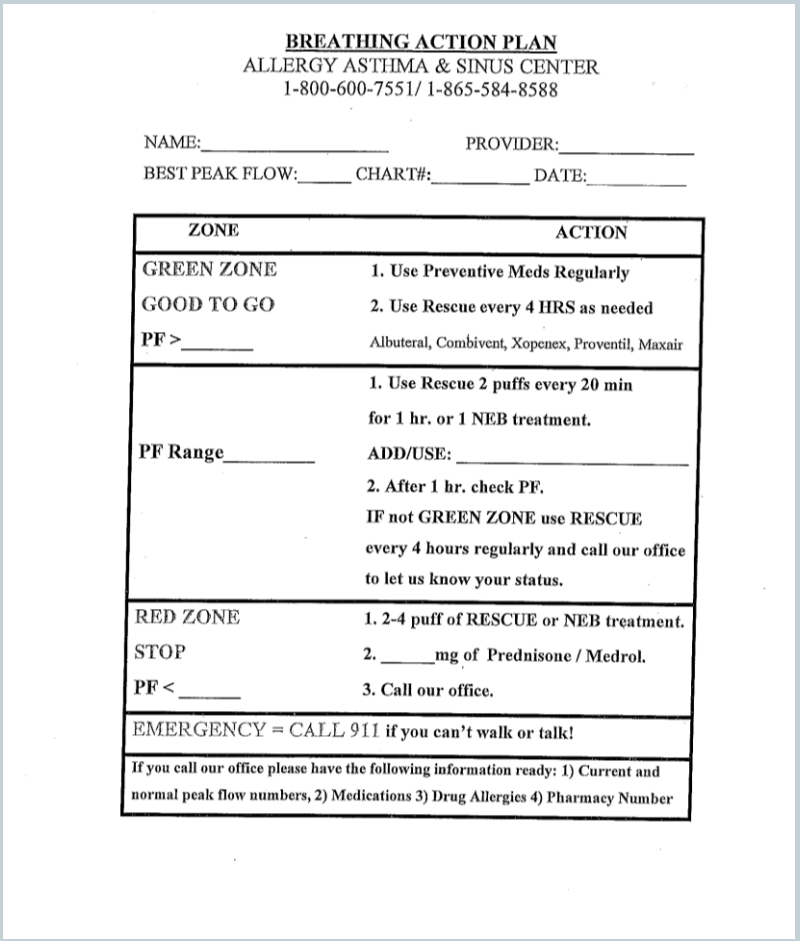
Framework: Social Cognitive Theory



Project Design

- Improvement of electronic asthma action plan
- Design screenshots for mobile phone application
- Development of mobile phone application
- Evaluation of application

Project Plan and Methodology:
Improve Electronic Asthma Action Plan



BREATHING ACTION PLAN
ALLERGY ASTHMA & SINUS CENTER
1-800-600-7551/ 1-865-584-8588

NAME:_____ PROVIDER:_____
BEST PEAK FLOW:_____ CHART#:_____ DATE:_____

ZONE	ACTION
GREEN ZONE GOOD TO GO PF >_____	1. Use Preventive Meds Regularly 2. Use Rescue every 4 HRS as needed Albuteral, Combivent, Xopenex, Proventil, Maxair
PF Range_____	1. Use Rescue 2 puffs every 20 min for 1 hr. or 1 NEB treatment. ADD/USE: _____ 2. After 1 hr. check PF. IF not GREEN ZONE use RESCUE every 4 hours regularly and call our office to let us know your status.
RED ZONE STOP PF < _____	1. 2-4 puff of RESCUE or NEB treatment. 2. _____mg of Prednisone / Medrol. 3. Call our office.
EMERGENCY = CALL 911 if you can't walk or talk!	
If you call our office please have the following information ready: 1) Current and normal peak flow numbers, 2) Medications 3) Drug Allergies 4) Pharmacy Number	

GREEN ZONE: Doing well
No Breathing Difficulties

- No Coughing
- No Wheezing
- No Shortness of Breath
- No nighttime awakening
- Able to do usual activities (work, play, exercise)

IF using peak flow:
Peak flow is more than 80% of personal best: (_____)

CONTROLLER MEDICATIONS

Listed medication(s) are **DAILY** controller medication(s)

Medication **Directions**
1.
2.
3.
4.

For exercise-induced symptoms, add

YELLOW ZONE: Caution
Mild Breathing Difficulties

- Cough
- Wheeze
- Shortness of breath
- Waking from sleep because of these symptoms
- Some activity limitation because of breathing difficulty

IF using peak flow:
Peak flow is 60%-80% of personal best (_____ to _____)

QUICK-RELIEF (RESCUE) MEDICATIONS

- **Continue daily controller medication(s) as prescribed**
- Add 2-4 puffs of _____ or nebulizer treatment
- Recheck symptoms and/or peak flow after 15 minutes
- If symptoms improved and peak flow within normal range, return to Green zone
- If symptoms persist, add the following medication(s):
- If symptoms and peak flow remains low after 3 days, call the office for further instruction

RED ZONE: Medical Alert
Severe Breathing Difficulties

- Breathing is hard and fast
- Extreme shortness of breath
- Cannot do usual activities
- Difficulty talking or walking
- Rescue medicine not helping
- Symptoms worsening

IF using peak flow:
Peak flow is less than 60% of personal best (_____)

MEDICAL ALERT!

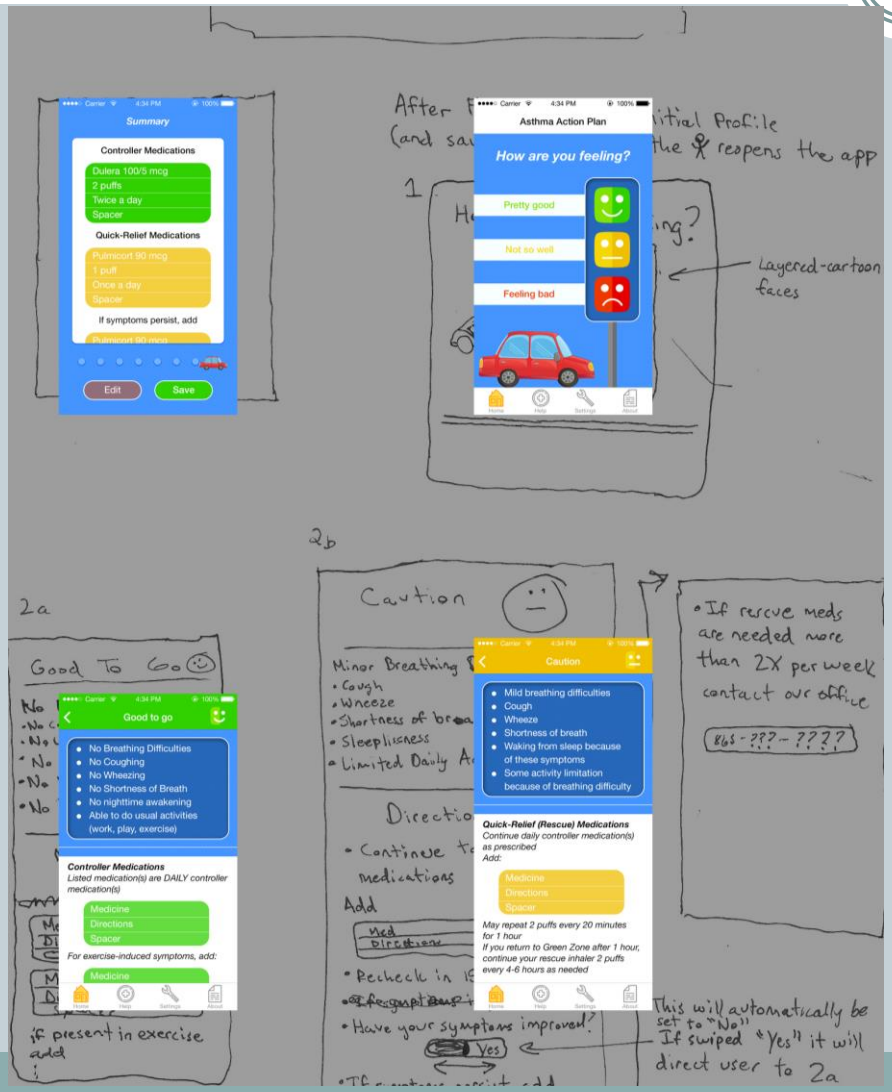
Take these medications and then CONTACT OUR OFFICE NOW!

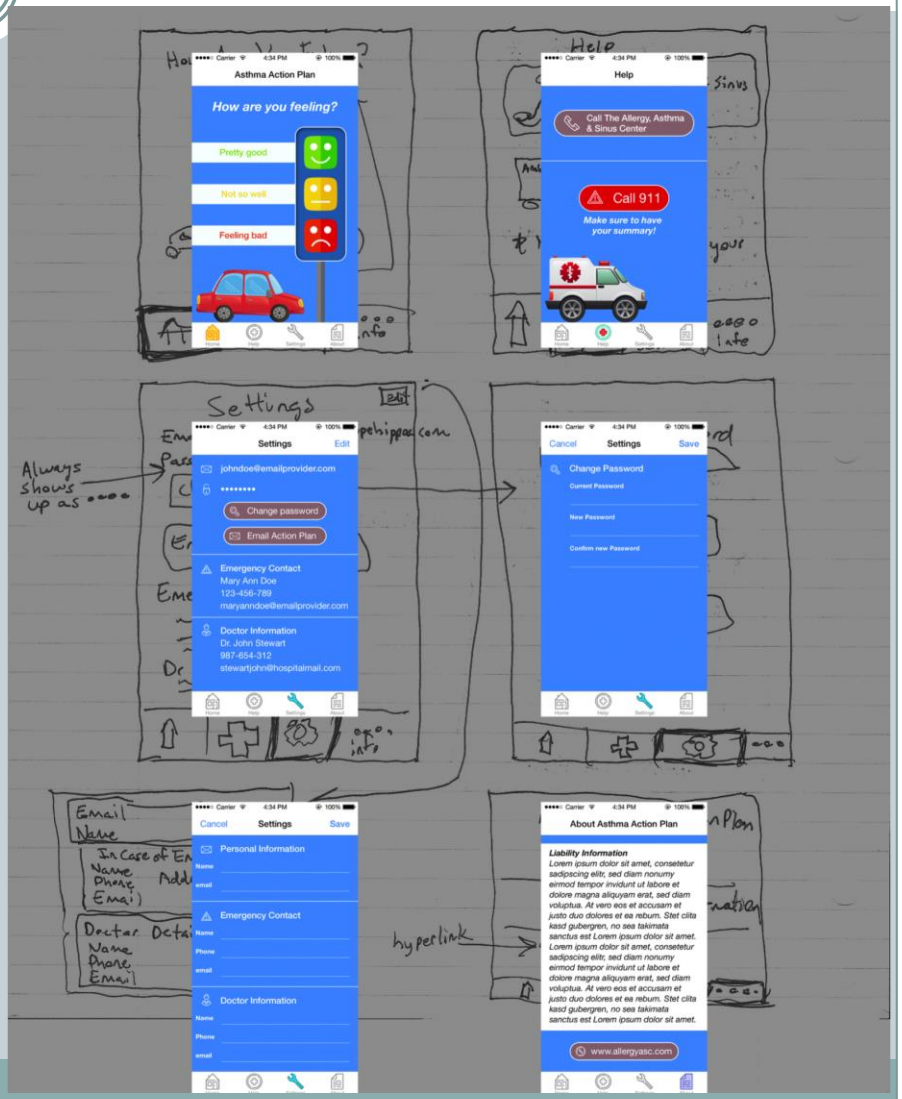
1.
2.

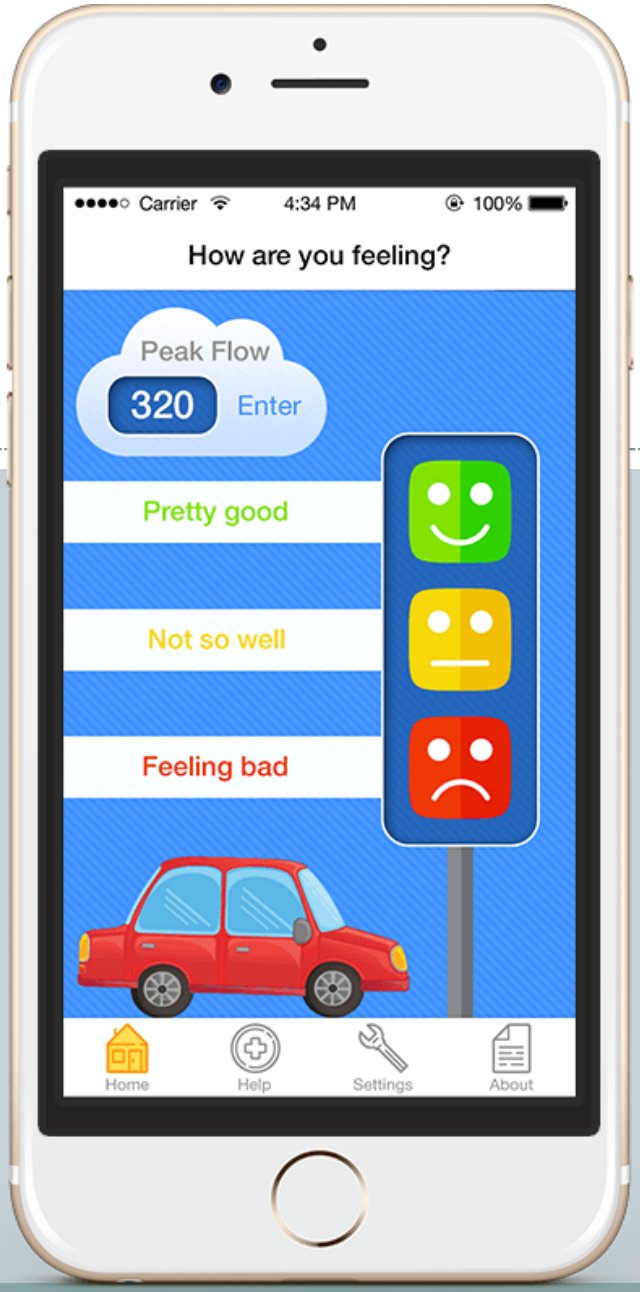
If symptoms are GETTING WORSE or NOT IMPROVING, **go to the hospital or call 9-1-1**

CALL OUR OFFICE
865-584-8588
1-800-600-7551

Project Plan and Methodology: Designing the Application



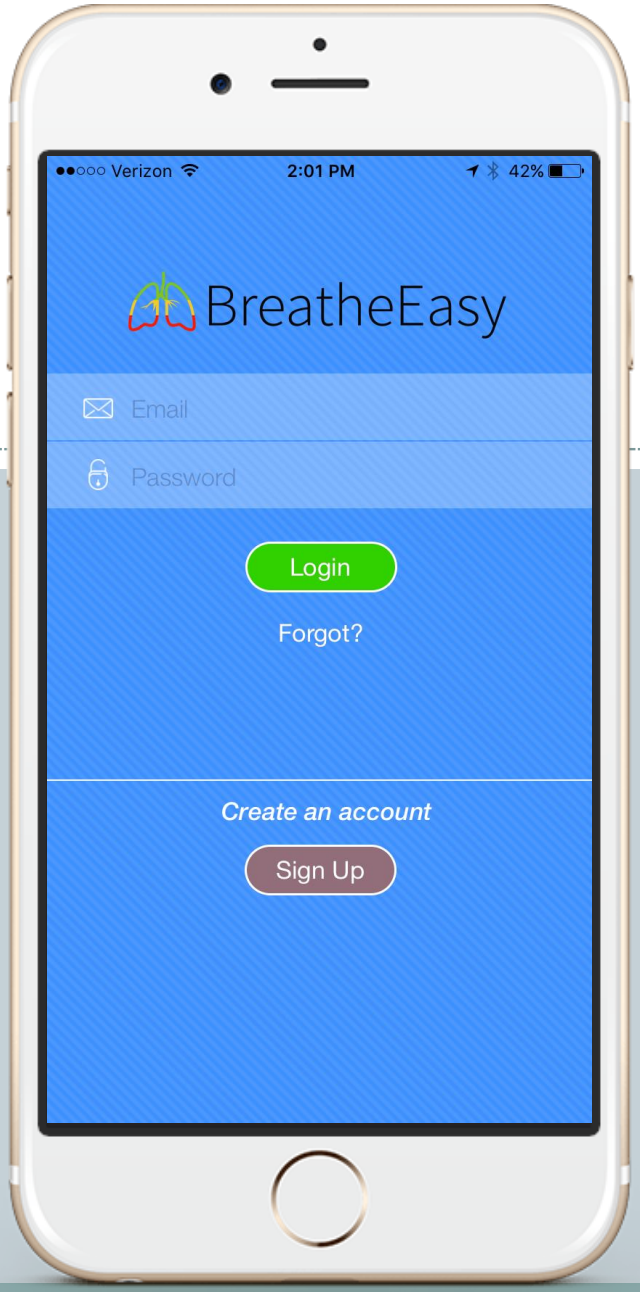




BreatheEasy

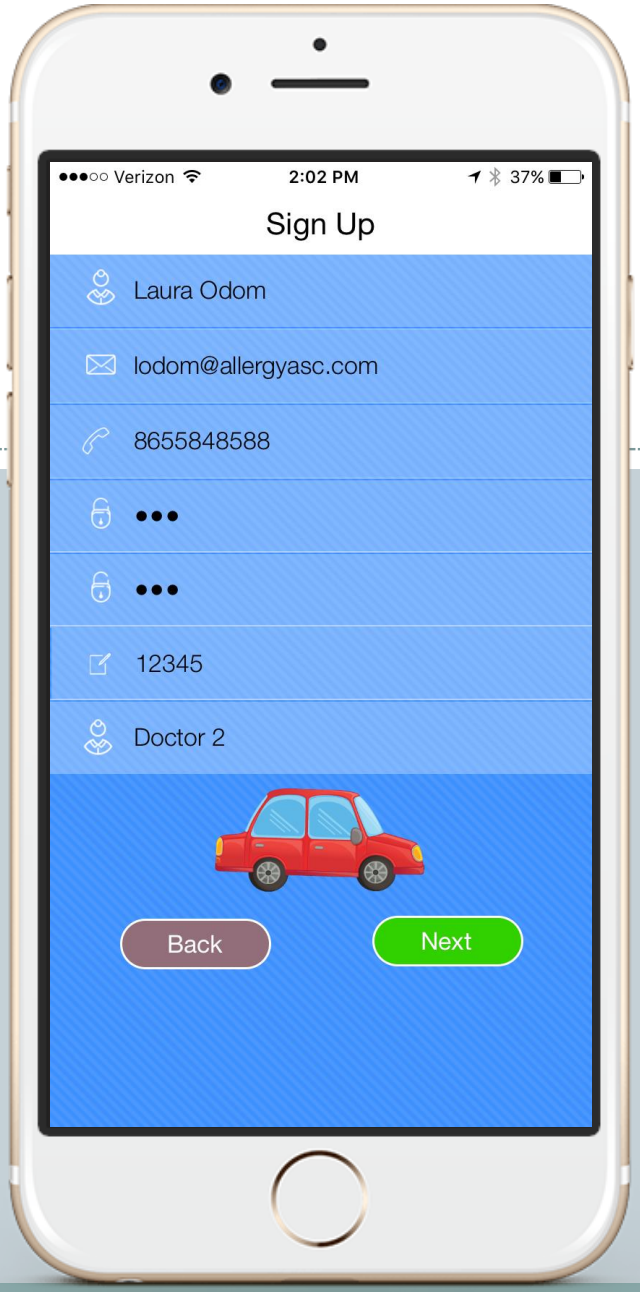
Project Design

Asthma Control in the Palm of Your Hand



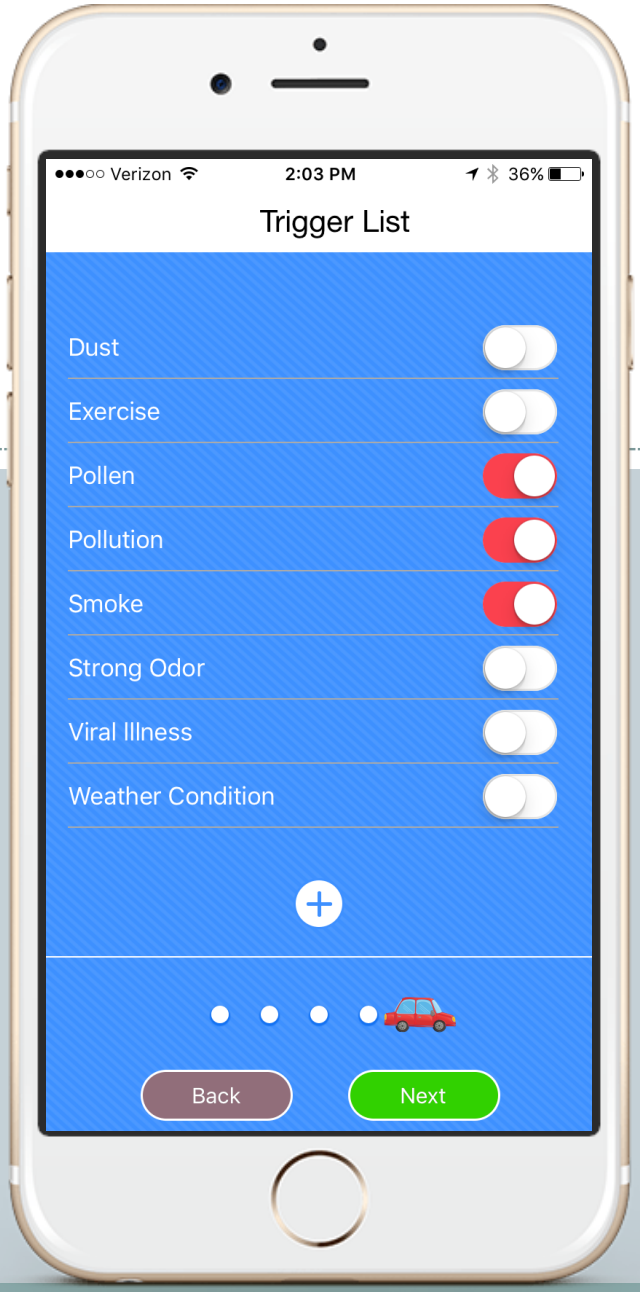
How it Works

SIMPLE LOGIN PROCESS



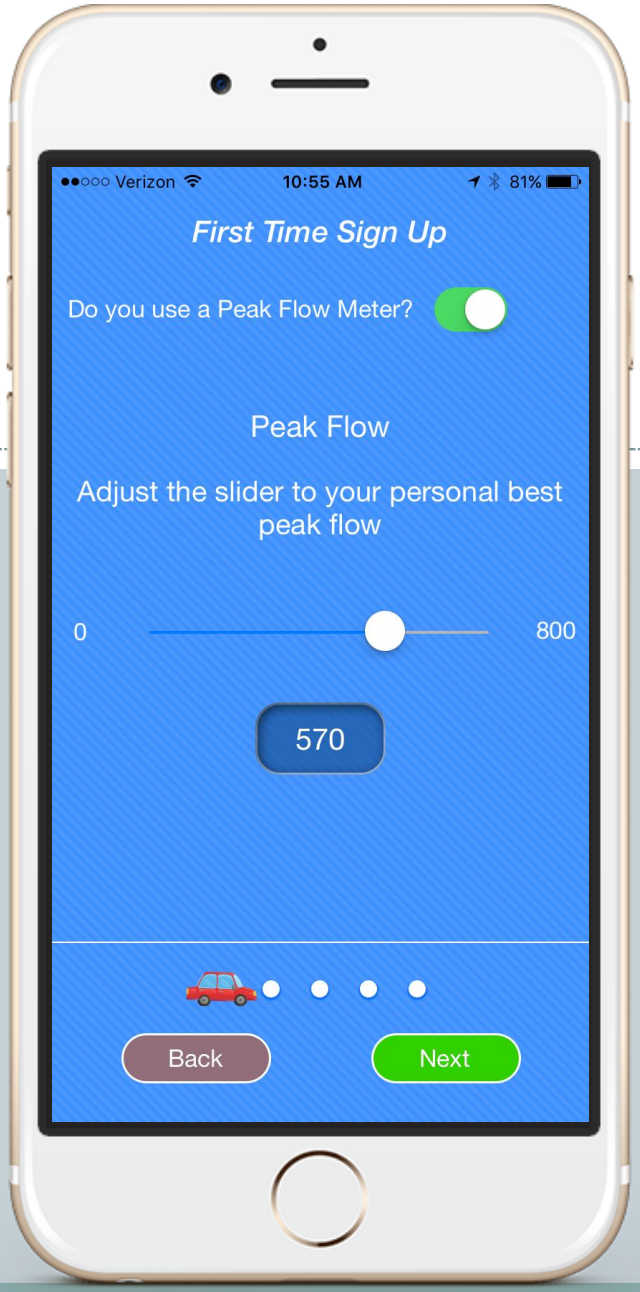
How it Works

EASY SIGN ON PROCESS THAT LINKS EACH PATIENT WITH THEIR SPECIFIC PROVIDER AND CHART NUMBER



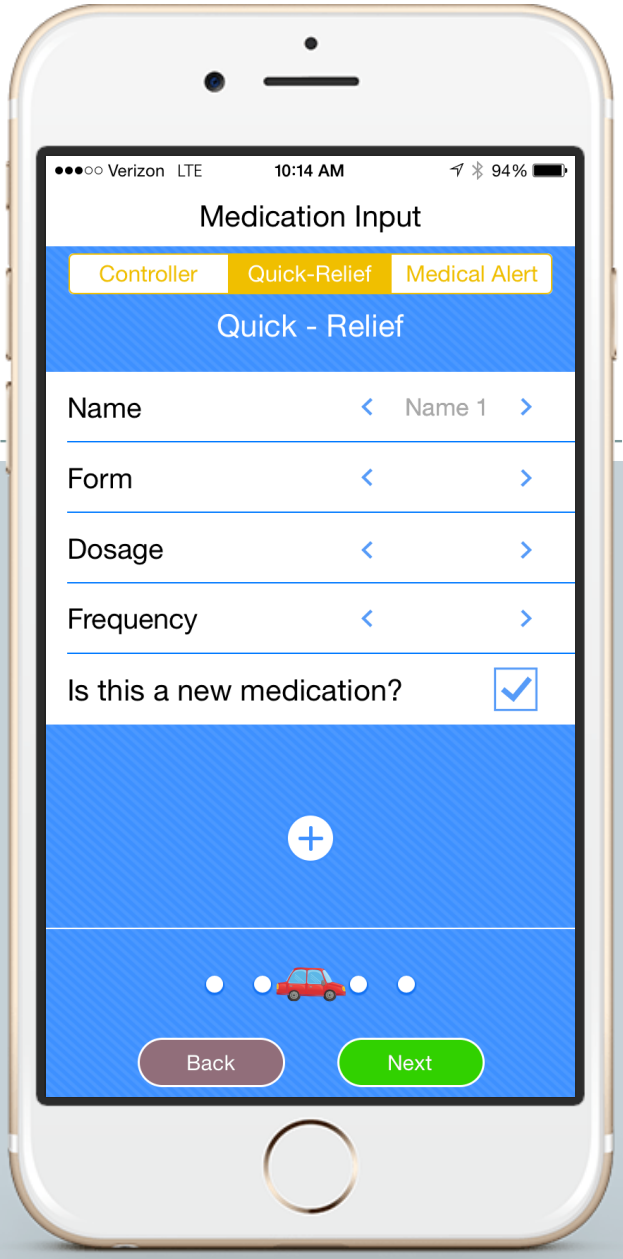
How it Works

TRIGGERS FOR ASTHMA ARE EASILY ENTERED INTO THE ACTION PLAN.



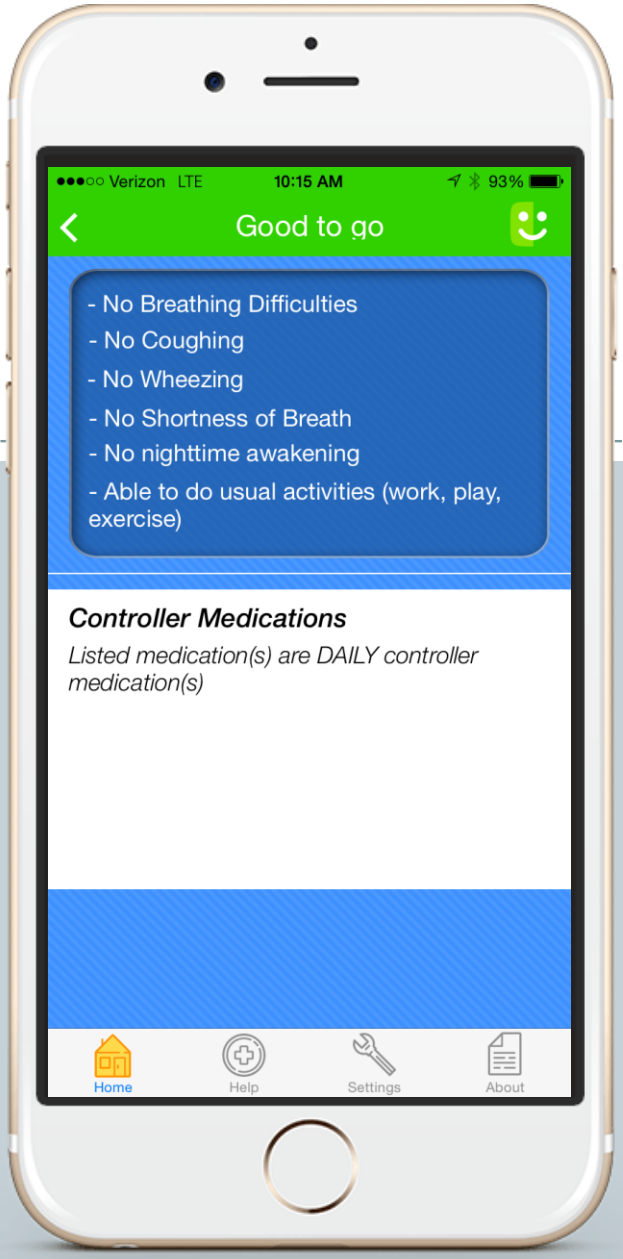
How it Works

ENTER PERSONAL BEST PEAK FLOW



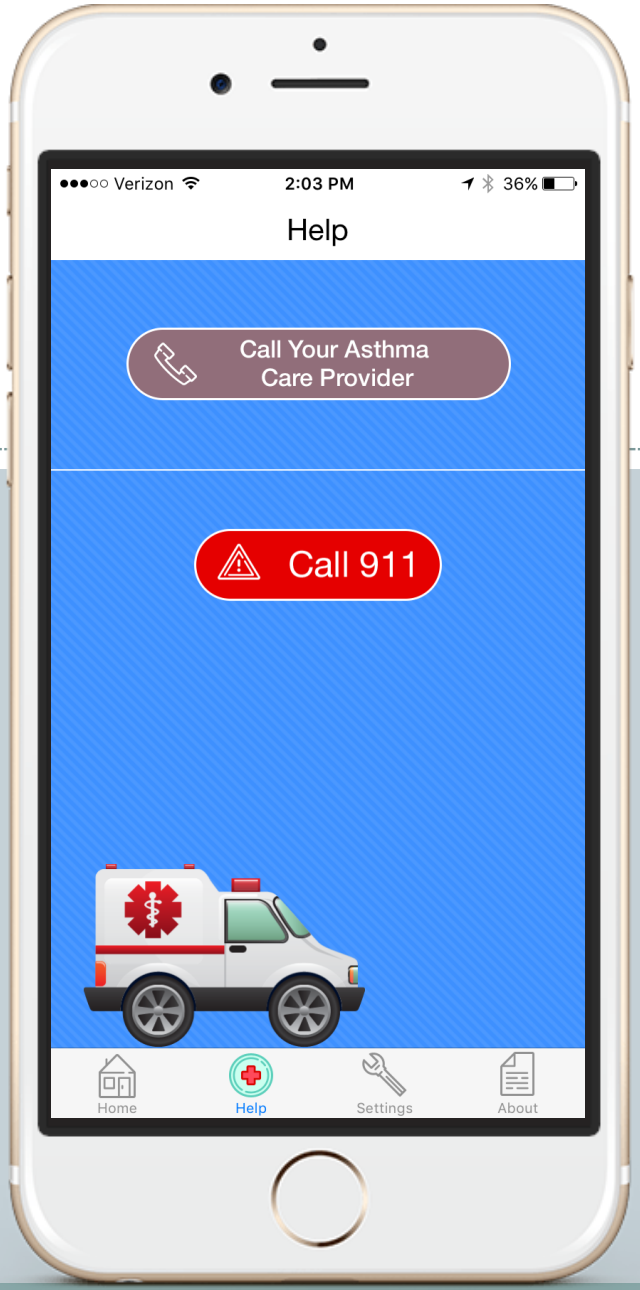
How it Works

CUSTOMIZE PATIENT'S UNIQUE MEDICATIONS FOR GREEN, YELLOW, AND RED ZONE



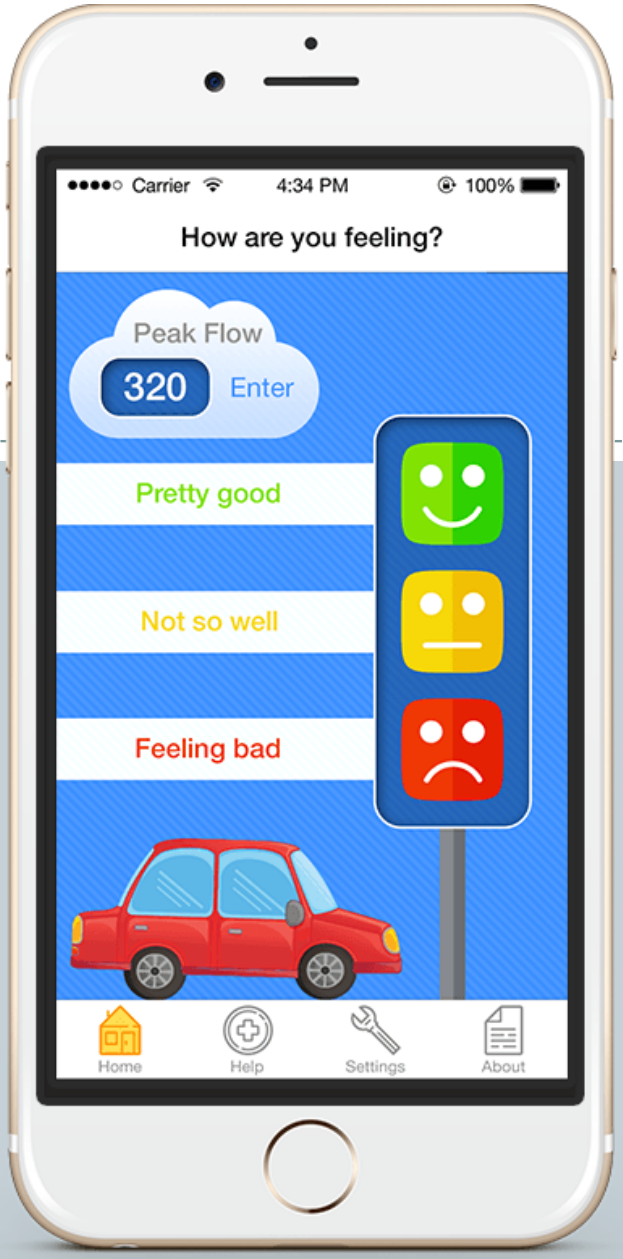
How it Works

SPECIFIC INSTRUCTIONS ARE PROVIDED TO PATIENT



How it Works

PATIENTS CAN CALL THEIR ASTHMA PROVIDER OR 911 DIRECTLY FROM THE APP.



Project Design

HOME PAGE FOR PATIENT

Data Analysis and Results

- 17 participants completed surveys
  - 12 patients (60% female; mean age 14.5)
  - 5 medical providers
- Results of evaluation revealed either agree or somewhat agree for each question.
- Important feedback came from comments

Asthma Action Plan Application Survey

Appendix F

Evaluation Tool for Asthma Action Plan Application

Your familiarity with using apps:

Use them all the time	Often use them	Sometimes use them	Have a few and barely use them	Don't have my own, but have used some friend's apps	Never use them	What's an app?

If you use an app, please choose the answer that best represents your experience:

I found the Asthma Action Plan app easy to use:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree

I can use the app without written instructions:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree
Areas that need further instruction				

The app does everything I would expect it to:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree
Functions that you would like to see expanded				

The app is designed for adolescents with asthma of any severity:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree
Areas that need simplification				

This app helps me understand what to do in the event of an asthma attack:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree

I think that I would use this app frequently:

Agree	Somewhat Agree	No Opinion	Somewhat Disagree	Disagree

Features I liked	Features that need improvement

Results of Survey

Excerpts of Key Comments from the Survey
"This would be helpful, especially if you didn't have your paper copy"
"Love that it is portable. I like that you can call the office and 911 directly from the phone"
"This would be a good thing to use/ Include chest tightness under the yellow zone instructions"
"I think that my mom would like it a lot"
"Incorporate a reminder to do peak flow or medication, Some way to track patient information, Have some sense of fear within the app so patients take it seriously, Possibility to communicate with office via a database"
"I think that a medication reminder might be helpful, or maybe a reminder to use the app"
"There needs to be a way to communicate the information to the provider during office visits- maybe a symptom tracker"
"I would use this much more than my paper copy. I don't even know where that is!"
"I think my Mom would feel better if I had this- she wouldn't worry so much"
"It would be nice to be able to print this in addition to giving it to the patient"
"I would like to see an education piece within the app in addition to the action plan"
"Love it!"

Impact of Results on Practice

- Patient feedback focused on user-interface with the application
  - Concerned with functionality
  - User-friendly experience
- Provider feedback focused on efficiency in clinical setting

Strengths and Limitations

- Strengths
  - Improved access for patients
  - Simplify asthma care through step wise approach
- Limitations
  - HIPAA compliance
  - Data transfer from mobile phone to electronic medical records
  - Survey participants may have experienced bias

Future Implications for Practice

- Possibility to decrease emergency department rates among patients with asthma
- Potential for the application to be used for research purposes
- Marketing potential for other chronic disease management

References

- Allergy and Asthma Foundation of America (AAFA). Asthma Facts and Figures. Retrieved from https://www.aafa.org/display.cfm?sub=42&id=8 on January 26, 2015.
- American Lung Association Asthma in Adults Fact Sheet. (2012). Retrieved from http://www.lung.org/lung-disease/asthma/resources/facts-and-figures/asthma-in-adults.html on October 24, 2014.
- Andrews, K., Jones, S., Mullan, J. (2014). Asthma self-management in adults: A review of the current literature. *Collegian, 21, 33-41.*
- Beauchesne, M.F., Levert, V., El Tawil, M., Labrecque, M., Blais, L. (2006). Action plans in asthma. *Canada Respiratory Journal, 13(6),* 306-310.
- Centers for Disease Control and Prevention Asthma data and statistics. (2014). Retrieved from: http://www.cdc.gov/healthyyouth/asthma/data.htm on October 27, 2014.

References

- Centers for Disease Control and Prevention (2011). *Vital Signs*, May 2011. Retrieved from http://www.cdc.gov/vitalsigns/asthma/index.html on October 12, 2014.
- Global Initiative for Asthma. (2012). Global strategy for asthma management and prevention. Retrieved from http://www.ginasthma.org/local/uploads/files/GINA_Report_March13.pdf.
- Federal Interagency Forum on Child and Family Statistics. *America's Children in Brief: Key National Indicators of Well-Being, 2012*. Retrieved from http://www.childstats.gov/americaschildren13/health8.asp on September 14, 2014.
- Mulvaney, S., Ho, Y., Cala, C., Chen, Q., Nian, H., Patterson, B., Johnson, K., (2013). Assessing adolescent asthma symptoms and adherence using mobile phones. *Journal of Medical Internet Research, Jul 17;15(7):e141*. doi: 10.2196/jmir.2413.

- Centers for Disease Control and Prevention (2011). *Vital Signs*, May 2011. Retrieved from http://www.cdc.gov/vitalsigns/asthma/index.html on October 12, 2014.
- Global Initiative for Asthma. (2012). Global strategy for asthma management and prevention. Retrieved from http://www.ginasthma.org/local/uploads/files/GINA_Report_March13.pdf.
- Federal Interagency Forum on Child and Family Statistics. *America's Children in Brief: Key National Indicators of Well-Being, 2012*. Retrieved from http://www.childstats.gov/americaschildren13/health8.asp on September 14, 2014.
- Mulvaney, S., Ho, Y., Cala, C., Chen, Q., Nian, H., Patterson, B., Johnson, K., (2013). Assessing adolescent asthma symptoms and adherence using mobile phones. *Journal of Medical Internet Research, Jul 17;15(7):e141*. doi: 10.2196/jmir.2413.