AAFP Tobacco and Nicotine Prevention and Control Chapter/Family Medicine Residency Program
Mini Grants Final Report
2016-2017

1. **Why did you choose this project? In other words, how was it relevant to your chapter/residency?**

Aultman Family Medicine Residency Outpatient Clinic, also known as Aultman Family Practice Center caters to urban poor, Medicaid and Medicare patients, some uninsured patients and minority with commercial insurance. Prior to this grant, 1293 or 22% were smokers. Majority of the smokers have co-existing mental illness such as anxiety, depression and bipolar disorder. In addition to the psychiatric conditions, majority also have co-morbidities such as heart disease, stroke, cancer and COPD. The hospitalization and even re-admission are also increased among patients who are smokers. Unfortunately, our patients have poor insight and awareness regarding the risk of smoking plus they lack motivation to quit. Recognizing these facts, it is always a challenge on how to help them quit.

Before the grant, even our providers in the office have limited awareness on the resources available to help our patient population to quit. Aultman Hospital has in-house Tobacco Treatment Program with certified treatment specialists also called the *Aultman Give It Up!* Program (AGIUP). They hold 6-session classes for 6 weeks and give free nicotine patched to those who are present. For each class, there are different focus areas.

- Session 1: Nicotine Dependence
- Session 2: Withdrawal
- Session 3: Stress Management
- Session 4: Avoiding Weight Gain
- Session 5: Relapse Prevention
- Session 6: Review and Celebration

Most of their patient enrollees come from the hospital referral. Patients who are admitted for acute coronary event or COPD exacerbation are automatically referred. The existing tobacco cessation program has been available to the community since 2008. It is underutilized even in some of our highest risk populations. The grant created a solid partnership between the Give It Up! Program and Aultman Family Medicine Residency Program. This allowed for increased referrals and better communication.

This project is also relevant to the Behavioral Health Team due to the impact that tobacco use has on overall health of our patients. Adding the service of behavioral health empowered our patients; given the co-existing mental illness among our patients who are also smoker. Life stressors, trauma, and behavioral health symptoms impact the success of patients in tobacco cessation.

2. **What did you do and how did you accomplish it?**

We increased both knowledge and awareness in the Aultman Family Practice Center. Noon conference about tobacco cessation, Aultman Give It Up and AultQuit app was presented to all Aultman Family Medicine providers by Dr Ali Syed (PGY 3), Sara Schaub (Aultman Give It Up Tobacco Treatment Specialist) and Marc Schneider (Director of Innovation). A session on motivational interviewing and behavioral change entitled, "Helping Your Patients Quit Smoking: Effective Strategies for Brief Interventions" was presented by Laura L. Manzey, PharmD, BCPP to all residents, front office and nursing staff and faculty.

Aultman Family medicine providers were reminded about the Aultman Give It Up program during daily huddles. Posters and bulletins about the Aultman Give it Up Program were placed in exam rooms and waiting rooms to increase patient awareness. Flyers were also handed out to patients who are smokers promoting Aultman Give It Up. Our residents- Dr. Lavanya Ravindran and Dr. Kriti Arora also delivered Health Talk in the community outreach education session on smoking cessation entitled, "How to Give It Up and Leave the Pack Behind!"

Since our patients are at different stages in terms of behavior change, we recognized that success in quitting ultimately depends on the patients' readiness and personal motivation. Importance readiness confidence (IRC) scale was created and providers were notified about the significance of this tool. Patients interested in smoking cessation were provided with an IRC scale to quantify commitment and to increase referral compliance. Patients that scored $\leq$ 6 triggered the need for further counseling with a tobacco cessation specialist. Scores $\geq$ 7 were referred to AGIUP or the tobacco cessation specialist. Patients have two options: (1) AGIUP which is located in the Cardiac Rehabilitation Center of the main hospital or (2) Sandy Sibert CTTS who is our tobacco treatment specialist in the outpatient setting. Free nicotine patches are provided if they attend all classes. Patient will choose where to go based on their schedule and transportation needs.

As far as the AGIUP was concerned, we had three major upgrades as a result of the grant. 1) Create an App called AultQuit which would send texts to participants throughout the classes to assist with quitting and reminders about classes. We created this with help of our Innovation team here at the hospital. This also automated our sign up process so a physical person did not have to sign up each person. AultQuit also allows for better data collection and retrieval and has future potential as a stand-alone app; 2) Give incentive for those who attend the classes by giving $10 gift card as a raffle item; and 3) Enhance the mental health aspect of the existing classes. Aultman behavioral health began assisting with 2 classes in each six session group. This enhanced the cognitive behavioral therapy and mindfulness components of the program and allowed for increased referrals for outside mental health services for patients who needed it.

Licensed clinical counselors partnered with nurses and patients to develop skills for managing stressors within daily living that impact motivation and effectiveness for tobacco cessation. Our focus was on mindfulness and cognitive behavioral health skills. Patients learned and practiced mindful breathing within the group setting, discussing times when this can be used effectively within their daily routine. Individuals also used their five senses to personalize a list of items that assist them in changing emotions given increased stress. Patients identified activating events that increase the likelihood of using tobacco. They processed automatic thinking related to the event, and developed a list of facts to challenge this thinking; therefore, impacting the behavioral reaction to the activating event.

3. What were your goals and to what extent did you achieve them?

1. Keep people in the six week "Give It Up" classes so that they finish or graduate. Our goal to cater to 100 participants from Aultman Family Practice Center. Before the grant, there is a 50% drop out rate and we wish to decrease drop rate to 25%. There is a 68% quit rate if patients complete the entire six-weeks of classes. The dropout rate is 54% during the grant. This is not much different from pre-grant data.
2. Train one Tobacco Treatment Specialist to work in Clinic area and empower all the staff who have direct contact with patients daily. This was achieved by sending Sandy Sibert for training as Certified Tobacco Treatment Specialist from October 3-7, 2016 in Columbus OH. The training was conducted by The Breathing Association. A session on motivational interviewing and behavioral change entitled, "Helping Your Patients Quit Smoking: Effective Strategies for Brief Interventions" was presented by Laura L. Manzey, PharmD, BCPP to all residents, front office and nursing staff and faculty.
3. Extend patient base to include mental health patients. All patients who are willing to go to AGIUP or Sandy Sibert are referred.

4. Partner with Pfizer Pharm-D. The following are their contribution in kind and were all achieved:
    a. Posters, flyers, videos
    b. Patient education materials that are appealing, simple and effective
    c. Provider tools to motivate our patients to quit
    d. Training sessions (1 hour each) to train our MAs, LPNs, nurses and providers. Title: Assist to Quit. It is a training session/s on motivational interviewing and counseling with focus on smoking cessation
    e. They also shared following website with built in applications
        i. https://www.quitterscircle.com
        ii. https://www.planmyquit.com/expert-quit-tips.
    f. Training for prescribers on smoking cessation pharmacotherapy
5. Assess changes in patient knowledge, attitudes, and beliefs about tobacco use. Patients now even start the conversation re: smoking cessation and request referral themselves.
6. Assess changes in employee awareness of existing workplace tobacco cessation programs, policies, and benefits. This was achieved through education. However, new hire may not have been oriented on this program.
7. Number of residents, medical staff and patients trained on new tobacco cessation programs, policies and benefits. This was achieved through series of training, huddles and constant reminder on smoking cessation tools.

4. How did you measure your goals?

1. The goals for the AGIUP were all quantifiable so the number of patients for all categories was tracked before and during the grant. We specifically looked at the referral rate, enrollment rate, and attendance rate, meaning they attended 1 session or more. The graduation rate is defined as those attending at least 5 of 6 sessions. The quit rate was also measured based on the patients' self-report and CO breath analysis.

Before Grant: 6 months before Oct 2016 (March 2016 to Sept 2016)

A> FP Patients

1. FP patients referred- 12 (50%)
2. FP patients enrolled – 7 (5%)
3. FP patients who attended- 5 (9%)
4. FP patients who graduated- 1 (3%)
5. FP patients who quit- 1 (4%)

B>NON-FP patients (all other outside offices)

1. Non-FP patients referred – 12 (faxed orders from other providers)
2. Non-FP patients enrolled- 119
3. Non-FP patients who attended- 53
4. Non-FP patients who graduated- 29
5. Non-FP patients who quit- 21

During the grant: Oct 2016 to April 2017 (6 months)

A> FP Patients

1. FP patients referred- 45 (82%)
2. FP patients enrolled- 21 (15%)
3. FP patients who attended- 3 (5%)
4. FP patients who graduated- 2 (7%)
5. FP patients who quit- 2 (15%)

B>NON-FP patients (all other outside offices)

1. Non-FP patients referred – 10 (faxed orders from other offices)
2. Non-FP patients enrolled- 116
3. Non-FP patients who attended- 60
4. Non-FP patients who graduated- 25
5. Non-FP patients who quit- 11

*Non-FP data contains all other patients in the program besides FP regardless of whether they were referred by a provider or not.

2. Our Family Practice Center CTTS Sandy Sibert also tracked the patients. She officially started in her role as our tobacco treatment specialist on February 13, 2017. We call this as Aultman Give It Up! Look-a-Like.
    a. 28 were referred to me from Aultman Family Practice
    a. 4 no shows; 2 cancellations
    b. 7 Patients for the Aultman Give It Up! Look-a-Like seen.
    c. New Patients take about 45 minutes return appointments take 30 minutes each session.
    d. We test their CO Levels at each visit
    e. 3 patients have upcoming appointments scheduled
    f. 3 returning appointments scheduled
    g. Messages left for all others 12 patients to return calls for the Look a Like Class
3. Patient Questionnaire or smoking cessation survey was developed by Aultman FP and Pfizer Medical. The goal was to assess current smoking behavior in a sample of patients, as well as how the Aultman Family Practice office addresses smoking cessation with those patients and what tools and resources patients use in their smoking cessation efforts.

    As of this reporting date, there were 23 patients surveyed (14 females; 4 males; 5 not reported; mean 44.5 years old [range: 21-64]). There were 17 current smokers, 1 former smoker and 1 non-cigarette tobacco user. Only current or recently quit smokers completed the entire survey. Of the 17 current smokers, 16 had been a patient in Aultman FP for more than 6 months. The average length of smoking was 24.5 years (range: 5-50). Fourteen patients were exposed to significant second hand smoke or smokers in other settings. Ten of the current smokers smoked less than 1 pack per day. The most frequently reported comorbid conditions were depression/anxiety/bipolar (9 patients), hypertension (6 patients) and lung disease (5 patients). Fourteen patients had attempted to quit between 1 and 5 times in their lives. The longest time spent without a cigarette in the past 12 months was less than 24 hours for 6 patients and between 1 and 2 weeks for 4 patients. The most commonly used strategies for quitting in the past year were NRT (8 patients), prescription drugs (5 patients), “Cold Turkey” (5 patients), Aultman Give it Up (2 patients) and Self Help materials (2 patients).

    The survey asked patients about the office staff’s interactions with them about their smoking behavior as a way to identify current behaviors by residents and providers. Specifically, the practice wants to identify areas of potential further improvement during the grant project and moving forward. The proportions of patients who indicated that no one in the office had engaged in the following activities were as follows: asking about smoking (6%); advising about importance of quitting smoking (6%); assessing readiness to change smoking habit (19%); assisted with booklets, videos or other materials to help quitting (25%); arrange referral to Aultman GIVE IT UP program (44%); recommended other strategies (19%).

    Finally, the paper-based survey (not the iPad survey), which was administered to 6 patients, asked patients their level of agreement with statements indicating various parameters surrounding motivations and feelings about quitting smoking, as well as a key question about the interest in working with the provider on a

plan to quit smoking. On a scale of 1 to 10, it is assumed that ratings of 5 or above indicate an opportunity for providers to engage further in that parameter or in general quitting smoking discussions. The proportions of patients who indicated a level of agreement of 5 or greater for each parameter are as follows: smoking causing health problems (66%); smoking is a financial burden (100%); thinking about quitting is stressful (83%); interested in working with a provider to make a quit plan (83%). Overall, there was a high degree of agreement with each of the survey statements.

4. Survey Questionnaire for Front and Nursing Staff were administered both pre- and post-grant. Increase in self-assessed comfort level, knowledge in assisting with smoking cessation thru AGIUP and pharmacotherapy. There are descriptive answers on how they assist patients and the barriers that they encountered. It is important to note that their self-assessed comfort level and knowledge are subjective. 100% of the staff are aware of the AGIUP even before this grant however they increased the referral rate during the grant and referred to CTTS Sandy Sibert. In addition, they give pamphlets now that are readily available.
   No one mentioned that nurses are not educated. Nobody or 0% answered that assisting patient to quit is only the providers job in contrast to 43% prior to the grant. Training session is still requested to better assist our patients to quit. Prior to the grant, they suggested behavioral counselor, in-house tobacco treatment specialist and outside community resources. All of these three suggestions were facilitated because of the grant.

5. Survey questionnaire for the Residents were administered both pre- and post-grant. Increase in self-assessed comfort level, knowledge in assisting with smoking cessation thru AGIUP and pharmacotherapy. There are descriptive answers on how they assist patients and the barriers that they encountered. It is important to note that their self-assessed comfort level and knowledge are subjective. After the grant, the comfort level, knowledge in motivational interviewing using 5As, knowledge in pharmacotherapy all increased. Before the grant, only 70% of the residents are aware that AGIUP exists, now increased to 100%. In addition, the providers themselves refer to allied health professional to assist patients with quitting and not only limit this role to providers. Based on their pre-grant recommendations, the barriers such as lack of community resources, lack of knowledge on pharmacotherapy and lack of training sessions, and the need for more information about AGIUP were all addressed. Some providers also schedule the patients dedicated for smoking cessation visit.

5. How did this project benefit your chapter/residency? Please provide examples.

There is a palpable increase in provider and staff knowledge and comfort on tobacco cessation discussions with patients. This translates to improved patient's general knowledge on wellness and health

The *Aultman Give It Up!* Program was also a significant benefactor during the grant through the technology upgrades with the AultQuit text system and automated registration. We also had the improved class content with the assistance of Aultman Behavioral Health. The gift card incentives were helpful in keeping patients in the classes once they started.

Finally, there was the establishment of cross-column collaboration between our Behavioral Health, Family Residency Program, Innovation and our existing *Aultman Give It Up!* Tobacco Cessation Program.

6. What challenges did you face implementing your project and how did you overcome them?

Nursing staff expressed discontent with increased work load. After discussing that this is important for patient care, nursing staff accepted the responsibility and worked as a team with the providers

Patients expressed interest in tobacco cessation but did not commit to the *Aultman Give It Up!* program. Individuals were in different stage of change in the recovery process. This requires different skills appropriate for each stage of change. Clinicians noted stages of change within the group setting, and adapted skills

depending on the specific group members. Validated different stages in the process of any change someone is making.

IRC scale was created to assess level of commitment and determine the appropriate intervention for success which was either referral to *Aultman Give It Up!* or to CTTS Sandy Sibert for further motivation and counseling.

Some patients were interested in *Aultman Give It Up!* but could not attend the classes due to transportation and/or scheduling conflicts. These individuals were referred to Sandy Sibert to participate in "Aultman Give It Up Look-a-Like" program.

There were some technology issues where the texts were firing at the wrong time or people claimed they were not receiving them. Our technology specialist quickly responded to issues that popped up after an email.

Our team and behavioral health also had to work through who would take on what role during the class so the information flowed better. We had a team meeting to define roles and establish new content for sessions 3 and 5 of the group classes.

7. **Explain how you have or plan to disseminate the findings of your project with others.**

Presentation of findings at the Family Medicine Education Consortium and the Northeast Ohio Medical University Research day. We will continue to deliver Health Talk sessions to reach out to our community and not only the patients in our practice.

Behavioral Health providers will assess needs of individuals and their tobacco use within the behavioral health practice, making referrals to the *Aultman Give It Up!* program.

We do plan on presenting this program for Aultman's call for research papers, *Spirit of Inquiry*

<u>Describe how other chapters/residencies could learn from your project.</u>

8. **Do you think that your project could be easily adapted by other chapters/residency programs? Why or why not?**

Yes. Our patient population and their medical comorbidities are generalizable to other residency clinics. Education on motivational interviewing, pharmacotherapy and increase in awareness of available community resources or programs are helpful. We mainly focused on training and collaboration among the residents, nurses, staff, behavioral specialist, *Aultman Give It Up!* Program and our Innovation Team to help with App development. If the key players are available in the residency program, this can be easily adapted.

The cornerstone is developing a strong line of communication and having a designated person to follow up with patients on both sides.

The software that was developed by our Innovation Department could be ported to open source and/or commercialized depending upon the direction of the stakeholders. A larger collaborative and partnership relationships may broaden the opportunities in this space.

For those residency programs that do not have a tobacco cessation program to refer to, we would suggest starting a home-grown support group using the '2008 Guidelines for Treating Tobacco Use and Dependence' and/or adding an in-house tobacco treatment specialist for one-to-one counseling that could later grow into a group class for greater efficiency.

9. **What recommendations would you have for other chapters/residencies who want to replicate your project?**

Set a meeting with your tobacco cessation program coordinator and develop a referral system and a communication plan.

Increase in the study duration will increase number of patients/participants and also awareness. Establish clinic protocols that can be sustainable beyond the study period to ensure long term success. In terms of office process, providers are asking about smoking and advising about quitting. There may be opportunity to improve assessment of readiness to quit and assisting patients with various strategies for actually being successful. Most patients are willing to work with their provider on plans for quitting.

We think that the opportunities for text-based communication and nudges are still in their infancy. Additional work is projected, especially with greater patient numbers and A/B testing, may open up entirely new avenues of education and behavior modification.

Attachments: Appendix A – Give It Up Classes
Appendix B – IT Information Report

Contact Information

10. Chapter or Residency
    Aultman Family Medicine Residency Program
11. Your name and title
    Dr. Marquita Tolentino-Belen
    Assistant Program Director
12. Email address
    Mariquita.Tolentino-Belen@aultman.com
13. Telephone
    330-363-6211
    330-363-6250

NOTE: AAFP would like to help disseminate your good work by sharing your project with others via the AAFP Mini-grant web page. Please indicate whether you consent to AAFP sharing on its website your project results, poster, final report and contact information. ☒ Yes ☐ No

Aultman's Tobacco Cessation 6 week Outline

Session #1

I. What is tobacco addiction
   a. Nicotine dependence
      i. Physical
      ii. Psychological
   b. What's in tobacco smoke
   c. Harmful effects

II. Pharmocotherapy
   d. Discuss options (7 FDA approved choices)
      iii. Proper use
      iv. Contraindications
      v. Side effects
      vi. Consulting your physician
   e. Benefits of pharmacotherapy and classes together

III. Developing a quitting plan
   f. Set a date (advise to be at least 24 hrs. prior to session #3)
   g. Put together your tool kit
   h. Support system

IV. Check CO levels (optional)

Session #2

I. Congratulations and Pep talk
   a. Group check in
   b. Share experiences

II. Battling withdraw and cravings
   a. Types of withdrawal
   b. Coping strategies
   c. Avoiding Triggers

III. Medication check in
   a. Proper Use
   b. Side effects
   c. Q & A

IV. Prepare for the week ahead
   a. Potential Barriers
   b. Adapting quit plan
   c. Support system

V. Benefits
   a. What's happening to my body now
   b. What benefits can I expect

c. CO check

Session #3

I. Congratulations and pep talk
   a. Group check in
   b. Share ideas
   c. Medication check in

II. What is stress?
   a. Stress causes
   b. Stress signs and symptoms
   c. How the body responds to stress
   d. What causes you the most stress?

III. Exploring our personal stress
   e. How do our top stressors affect us?
   f. Tobacco use in times of stress
   g. What do we have control over?
   h. Learning to say no or not committing when you are unsure
   i. Accepting that you are not perfect
   j. Setting personal limits

IV. Dealing with stress
   k. Coping skills
      i. Positive Attitude
      ii. Reflection
      iii. Exercise
   l. Relaxation Techniques
      i. Breathing
      ii. Meditation
      iii. Visualization

V. Maintaining control of our stress in the long term
   m. Be prepared
   n. Personal Responsibility
   o. Maintaining positive thoughts
   p. Time management
   q. Taking time for yourself
   r. Journal or talk to someone helpful

V. Assertive Behavior
   a. Role play passive vs. aggressive vs. assertive behaviors

VI. Applying the stress balance pyramid to our tobacco free lifestyle everyday

Session #4

I. Congratulations and pep talk
   a. Group check in
   b. Share ideas
   c. Medication check in
II. Tobacco use and weight control
   a. Bodies response
   b. Comparing the health risks of weight gain and smoking
III. Weight Control 101
   a. Understanding metabolism
   b. Overcoming personal barriers
IV. Healthy Eating
   a. Food pyramid
   b. Portion control
   c. Healthy everyday substitutes
V. Daily Activity
   a. Getting more steps
   b. 10 minutes at a time
   c. Stress reduction
   d. Appetite and craving control
   e. Tips to stick with a routine

Session #5

I. Congratulations and pep talk
   a. Group check in
   b. Group discussion
II. Maintaining Motivation
   a. Smoke free mantra
   b. Quit Line
   c. Web based resources
   d. Relapse and staying on track
III. Enjoying freedom from tobacco
   a. Stay busy
   b. Prepare for major obstacles
   c. Relapse prevention
IV. Long term planning and benefits
   a. Review support services (quit line etc.)
V. Evaluation and outgoing forms

Session #6

I. Celebration
   a. Group check in

b. Group discussion

II. Healthy Lifestyle Choices
   a. Coping with stress
   b. Exercise
   c. Healthy Eating

III. Relapse Prevention

AAFP Tobacco and Nicotine Prevention and Control Chapter/Family Medicine Residency Program Mini Grant

Final Report - Information Technology Perspective

Aultman Innovation

Marc Schneider, Director
Innovation and Intellectual Property

Overview

Aultman Innovations was invited to participate in the reimagining of the tobacco cessation program as part of the grant proposal process. There was significant discussion as to the objectives and the deliverables in such a re-imagination of the program.

There is a popular bias to immediately assume that a smart phone app is the starting place for a public facing technology initiative. It was the feeling of participants that there could be more accomplished through simplicity and using existing information pathways than embarking upon a costly and perhaps limiting app development cycle.

Given that much of the anecdotal and clinical successes of such cessation programs are generally attributed to behavioral changes, it was felt that emphasis should be put on the delivery of content throughout the six weeks of classroom activity.

The content would be a combination of classroom content, course summaries and nudges that would serve to remind participants of their classroom activities and that small changes in their behavior can achieve great rewards. As such the primary communication mechanism was selected to be SMS text messaging. Since SMS text messaging is found on almost all phones including those that are not generally considered smart phones it has the distinction of being a somewhat universal app and also has the advantage of intimate user familiarity.

After deciding upon the primary communication mechanism, other features were added to the blueprint of the re-imagination. These other features included course management, an interactive website for enrollment, integrated voice mail, mobile website for attendance and student roster management.

The Platform

Given our experience in developing flexible web, server and mobile apps and devices, the technology stack that was selected for the project include the following:

- Amazon Web Services® for Linux Servers and Databases
- MySQL® for Relational Databases
- PHP for Server-Side Computing Language
- MachForms® for PHP Form Management
- TCPDF® PHP Library for PDF file generation
- Twilio® SDK for SMS Messaging and Voice Calling
- JQuery Library for Client-Side HTML and Javascript
- Adobe Muse® for Admin and User Menu System

The primary platform for student, course, class and user administration was designed to be browser-based, with web pages written in HTML and JQuery / Javascript as the client, and communicating with PHP server-side web endpoints. The endpoints communicate with the MySQL databases as well as performing general computation functions.

Both web server and database are cloud-based services from Amazon Web Services, using open source libraries.

The domain name of AultQuit.Com was selected to be the service name for the content and information server.

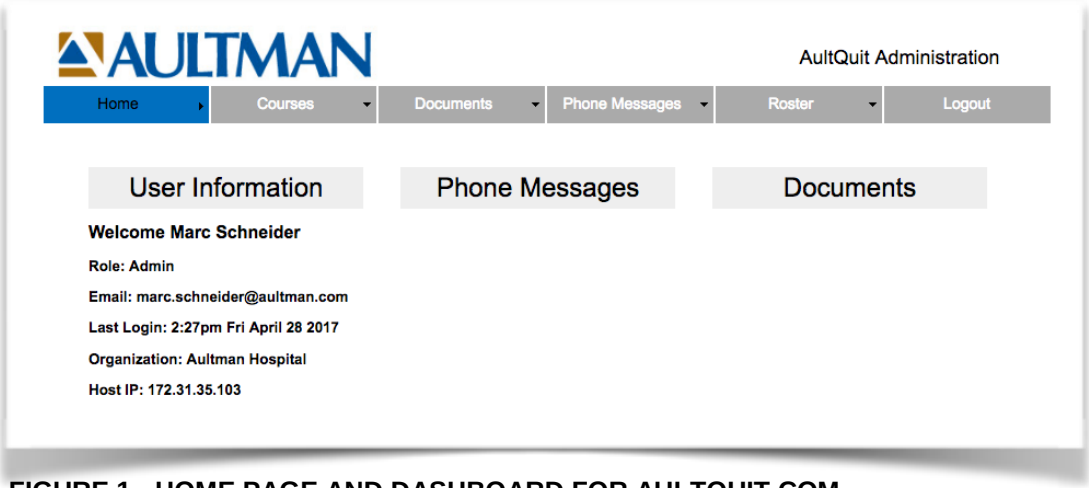

FIGURE 1 - HOME PAGE AND DASHBOARD FOR AULTQUIT.COM

Platform Costs

The software for this effort was development in-house by the Aultman Innovation Department. The costs of the development of this software was almost entirely labor; since the deployment and on-going platform costs are cloud-based, there have been almost no hardware costs. The only hardware cost incurred were $40 Yubi Key security tokens that are used for secure web access for each user.

In total, approximately 40 hours of labor was expended to develop this software. The bulk of the software was built in 45 days and various features and fixes have been installed since the go-live date.

The on-going fixed and variable costs of the software platform are the following:

Fixed Costs

Name	Period	Unit Cost
Domain Name	Per Year	$12
SSL Security Certificate	Per Year	Included in cost of Load Balancer

Variable Costs

Name	Period	Unit Cost	Factional Use?	Monthly Cost (720 Hours)
EC2 Server – T2.Micro Instance	Per Hour	$0.012	Dedicated	$8.64
RDS MySQL Database Server	Per Hour	$0.136	1/7 of RDS Server	$13.99
Load Balancer	Per Hour	$0.025	Dedicated	$18.00
Twilio Phone Numbers – 2 Lines	Per Month	$1 / Line		$2.00
Twilio SMS / MMS Text Messaging	Per Message (378 / Month Ave)	$0.0135 / Message	No	$5.10
Twilio Voice Calls	Per Call (28 / Month Ave)	$0.011 / Cal	No	$0.31
Budgeted Program Maintenance	Per Hour (1 Hours / Month)	$180		$180
Total Variable Cost Per Month				$228

Overall the budgeted cost of this platform, at the current student levels, is approximately less than $2800 / year.

Where Do Students Come From?

The first step after defining the basic technology platform parameters was to simply ask the question, where do our students come from? As it turns out, the sources of students are not unlike other flows that one would see in a typical sales process. For both the tobacco cessation program and a sales program, the goal is to funnel prospects into an enrolled student.

FIGURE 1: STUDENT ENROLLMENT FUNNEL

The first step was to inventory the current mediums that students were using to learn about the program and to enroll in it. The non-clinical referral pathways included the Aultman website, flyers, posters, print advertisements and word of mouth.

Website Integration

The Aultman Hospital website did include a page dedicated to the Tobacco Cessation Program at Aultman, also known as the Give It Up Program! The website included a phone number to a voice mailbox that was checked periodically by a program coordinator. Two opportunities presented themselves: the first was to provide a more informative webpage that could allow viewers to self-enroll, and the second was to provide a richer telephony experience than traditional voicemail.

Given that course management was a stated goal of the re-imagination, it was apparent that a database of class start times could be used to provide relevant and timely course information to the web page viewers. The idea of having class times and locations formed a sentinel point of thought. From this locus, it was easy to extend outward the rest of the architecture based upon typical class management functions.

Without delving into the minutia of database design, the overall architecture of the resulting database is made of up a series of parent-child relationships, with some emphasis on allowing the architecture to manage educational courses of any number of classes with any number of sessions and meeting places, with any number of students.

After establishing the basic course management structures the next step was to engage the corporate communications department of Aultman and have them install a HTML iFrame in a section of the webpage for the Give It Up! Program allowing content from the AultQuit.Com

dedicated server to populate the page with upcoming class information.

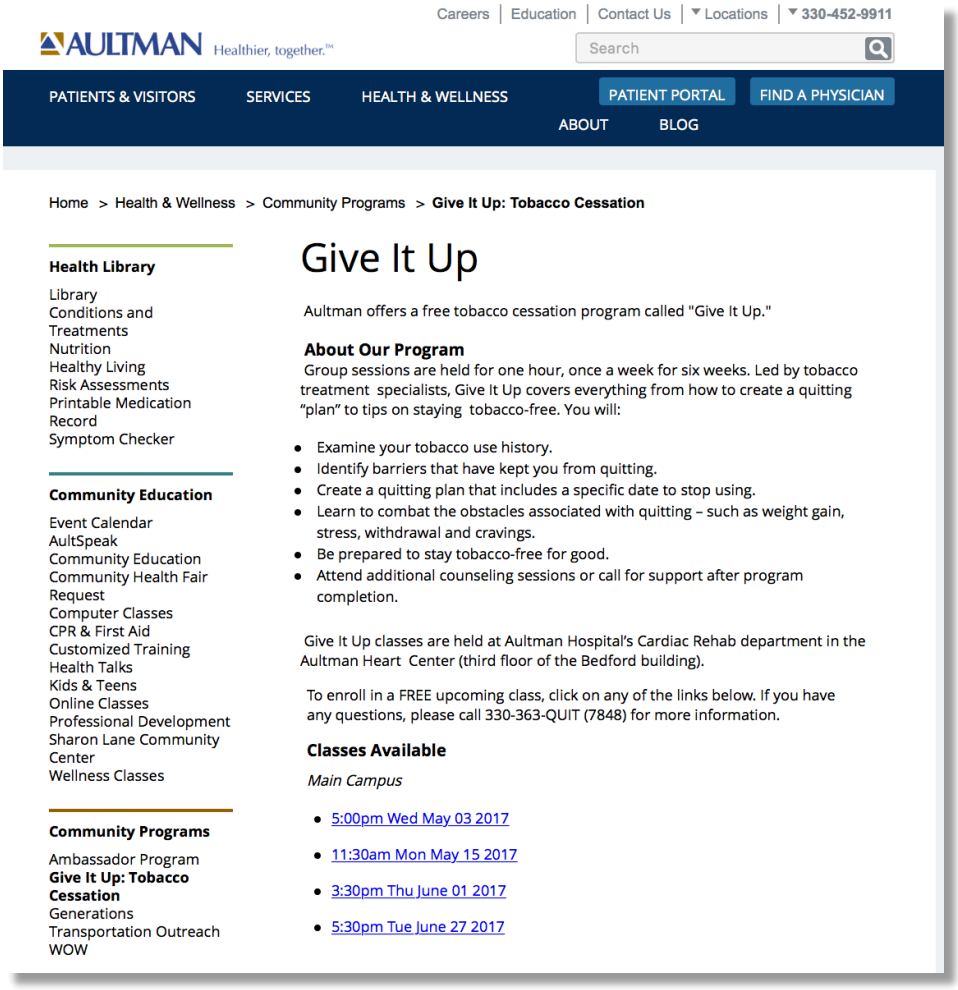

FIGURE 2: AULTMAN WEBSITE WITH IFRAME INSERTION

The class information is represented by hyperlinks, that when clicked upon, fill the iFrame with an enrollment form for the selected class. When completed, the contents of the completed form serve to populate the class roster as well as send out a notification to the student as to their successful enrollment.

Telephony Features

The second communication component of the Aultman Website, the phone number to the voice mailbox, had been widely distributed in both print advertising and flyers, so there was reluctance in abandoning the number for a new number. Also, the mnemonic nature of the number 330-363-QUIT, gave some additional cache to it in terms of marketing value. So, in addition to adding more engagement features to the phone experience, there was the challenge of moving the number to a communication platform that could accommodate these features.

The features that were added to the phone experience are:

- Auto-Attendant with Call Tree Menu
- Enrollment by Text and Smart Phone
- Class Information Texted to Your Phone
- Voice Mail to Program Coordinator

The communication platform for voice and SMS service was select to be Twilio®, given the wide breadth of their offerings and the flexibility in integrating these features into the code base. These features were written in PHP using the Twilio® PHP SDK library.

As to porting the existing number to Twilio, this was accomplished in a matter of a few days after getting permission from our corporate telecommunication department.

Of those callers who do choose to leave a voice mail, the voice mail is saved as a web endpoint and the endpoint is saved into the call log. An email notification is then sent out to the contact list of program coordinators, with a link to the voice email. Program coordinators can choose to listen to the voice mail from this link or can log into AultQuit and listen to the voice mail from a call log table.

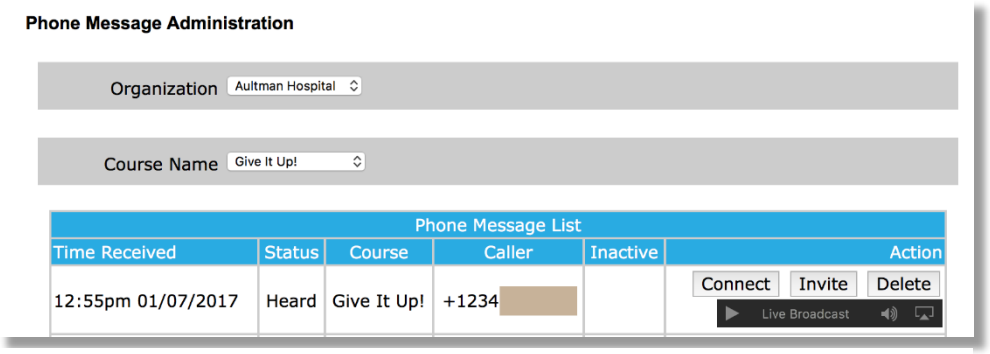

FIGURE 3: CALL LOG TABLE

The call log table includes several options that can make the enrollment process faster and easier. First, coordinators and callers can be connected by clicking on the **Connect** button, which first displays the coordinator's phone number and the caller's phone number. Once those have been verified, the system will call the coordinator's phone first, then after the phone is answered, it will call the caller's phone number and connect the two parties.

During the phone call between the coordinator and the prospective student, the coordinator can use the **Invite** button to text a link to the prospect that will lead the prospect to the enrollment form for the desired class time.

Enrollment Form

It is notable from a development point of view that the enrollment form that displays on the corporate webpage is the same form that displays on an enrollee's smartphone, reducing the maintenance and development costs. This was achieved by using MachForms®, a PHP based form manager that can present forms various formats and widths, accommodating the numerous devices that are available as web browser platforms.

The enrollment form includes some additional questions that cover marketing and base-line tobacco cessation evaluation. The form questions are:

- Name
- Birthdate
- Contact Preference (Text / Mobile)
- Insurance
- How did you hear about the program?
- Years of Smoking or Tobacco use?
- Number of quit attempts
- Heath problems

The answers to these questions are sent by the form manager to a PHP web endpoint and saved into the student's profile format. Also, the student record is enrolled to the class roster table for the class time selected.

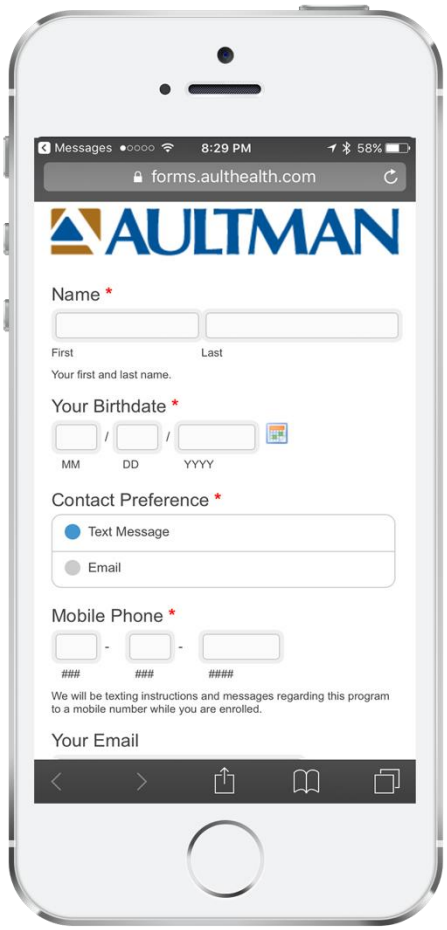

FIGURE 4: MOBILE WEB WITH ENROLLMENT FORM

Website Metrics

One distinct advantage of having an iFrame connection to the corporate webpage is that page view metrics can be reported directly to the AultQuit server, rather than asking the corporate webmaster for traffic statistics. By giving the iFrame some additional code, pages views are now recorded and can be inspected by various time periods. In future versions, it is anticipated that metrics will include click-through rates and overlay of advertising campaigns and PSA promotions of the program.

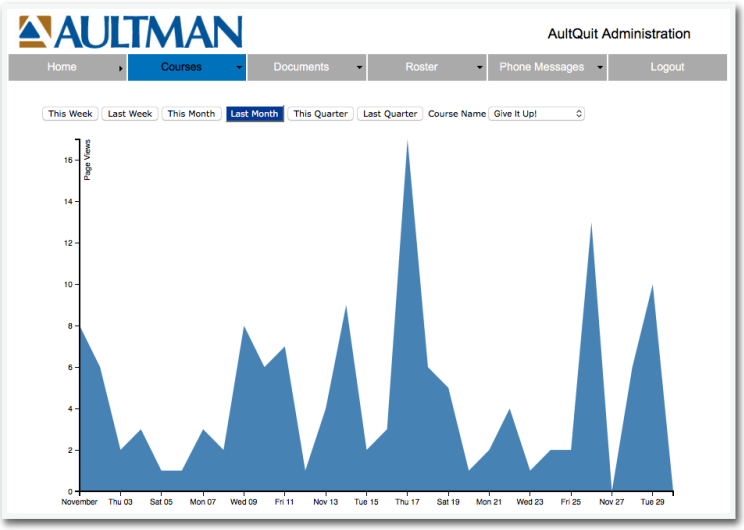

FIGURE 5: PAGE VIEW GRAPH

To date, 62 of the 125 students that have been taken the course since the systems inception, have self-enrolled via the web page or smart-phone link.

Course, Class and Content Management

To accomplish the goals for re-imaging the administration of the cessation course, numerous tables were built to contain the course, class and roster information. By building a hierarchical

table relationship, it is envisioned that additional educational courses in the future can be administered in the same manner.

Overall there are 39 database tables that function to administer and track the course and student information. Of these 6 deal with user administration and security, the other 33 hold information specifically for course management.

Content Management Server

Of note are the content group of tables. Another stated goal of this project was to improve engagement using technology. The content group stores, manages, and serves content to the enrolled students based upon class time. The content includes the following

- Welcome message
- Class reminder
- Class content
- Class summary
- Checkups
- Nudges
- Completion survey

The text component of the content record can contain placeholders for substitution when the message is sent. For example, the message for the class reminders has placeholders for room name, building name, directions to the room and are replaced by the associated fields from the class scheduling record for where that class is to meet.

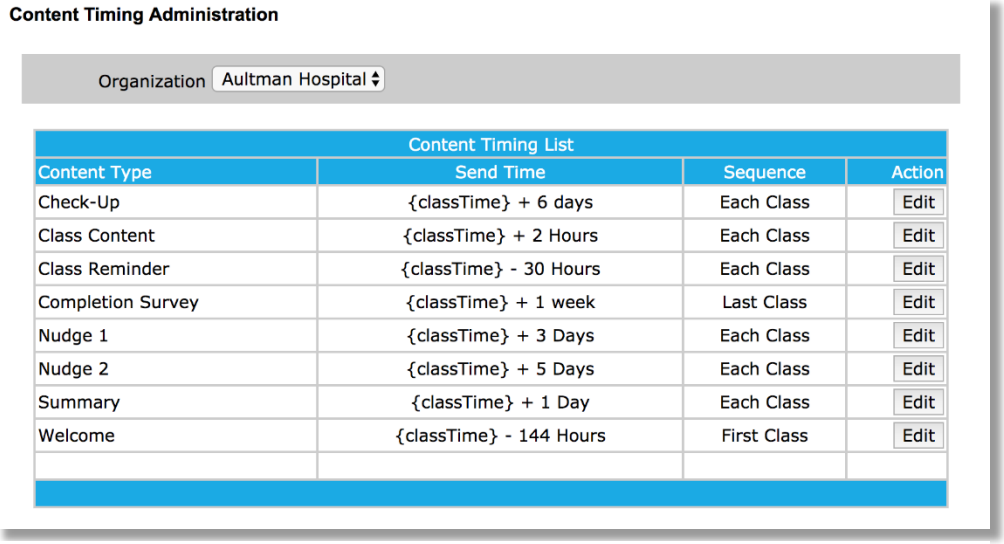

FIGURE 5: CONTENT TIMING TABLE

HTML tags can also be used to enhance the message formatting. For complex messages, the content can be sent as a link to a webpage reader for those who have elected to receive their messages by SMS text. Other students who have elected to receive their message by email, which only 3 out of 125 chose to do, receive their message as native HTML.

Content Examples

Based upon the observations made in the book **Nudge: Improving Decisions about Health, Wealth, and Happiness,** by Richard Thaler and Cass Sunstein, nudge messages were created to be served to the students on periodic basis between class time.

Nudge message are scheduled to send at class time + 3 days and class time + 5 days. Some of sample nudge messages are:

- *Track your smoking habits this week. Be sure to note when, what you are feeling, and what you are doing when you smoke*
- *Don't forget to use your designated smoking area as the only place you can smoke and find someone who will be your support.*

The Check-up type content ask a simple question and links the student to a form that reports to the student record. The Check-up questions are currently scheduled to send at class time plus 6 days or 1 day before the next class. Some sample check-up questions are:

- *How are you doing with cutting back or delaying your first cigarette of the day? Respond Great, Good, Just Ok, or Bad?*
- *On a scale of 1 to 10, rate how you are doing this week with 10 being fantastic and 1 being terrible. No matter how you answer, join the group this week and we will discuss*.
- *Having many craving? Text how many you are averaging per day. Grab a cinnamon stick to have in your mouth in place of a cigarette.*

Attendance Automation

Streamlining the tobacco cessation program would not be complete if we had not taken a mobile-first approach to the simple attendance sheet. Adding the mobile number of the class instructor to the instructor table and then directing the system to text out a link to a mobile web page for taking attendance was in keeping with the themes of this project.

Currently the system will text an encrypted string to the instructor's phone at least 4 hours before the scheduled class time. This string is valid for a limited time and will load a mobile web page for taking attendance for that class on that day.

FIGURE 6: MOBILE WEB ATTENDANCE

Future Enhancements and Features

There are several enhancements and features that have not yet been installed into the family of AultQuit programs. The most prominent is the imaging component of inbound fax referrals from provider offices. Technically this has already been accomplished but there have been road blocks in implementing this with our existing IT structure due to integration and security concerns.

Image Filing

The imaging system is designed to receive faxes and store them in an inbox and trigger an email message to the program coordinators on a periodic basis informing them of the number of inbound faxes that have not yet been filed.

The filing software allows the program coordinator to create a student record on the fly and call the student directly from the filing program to inform them of the reception of the referral and to schedule their first class.

Message Simulator

Given the possible complexity of content timing, content types and resulting behaviors, a message simulator would be a great tool to simulate and test the delivery of content. This would further simplify the creation of new content and move the management and maintenance of this body of software firmly into the hands of the program coordinators.

Future Enhancements

There are rapid and exciting developments taking place in the field of text bots, or text messaging systems backed with artificial intelligence. The Check-Up and Nudge content could be augmented with artificial intelligence to provide a richer experience and provide more insight into the student's behavior.

Summary

We are proud of the system that has been built for the Give Up It Program. It has helped streamline the manual administrative processes for this educational program, while also engaging students in new, convenient and ubiquitous ways. By using cloud-based services we have delivered a very affordable system in a short period of time that has advanced features that would have been impossible to deliver just 5 years ago.