Accessing Diabetes Treatment and Services for Community Members Living with Diabetes

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Type 2 Diabetes

37.3 million people have Diabetes
11.3% of U.S. Population

Requires self-management skills

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Type 2 Diabetes

A little over 8,000 medical specialist available to treatment patients

One Endocrinologists to 3,800 patients

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Defining low-resourced or medically underserved communities:

“Rural/medically underserved areas—defined as populations with low access to primary care providers, high infant mortality, high poverty, and/or high elderly population—have shown relatively poor diabetes outcomes compared to the urban/well-served areas” (source: Bonet Olivencia et a., 2021)

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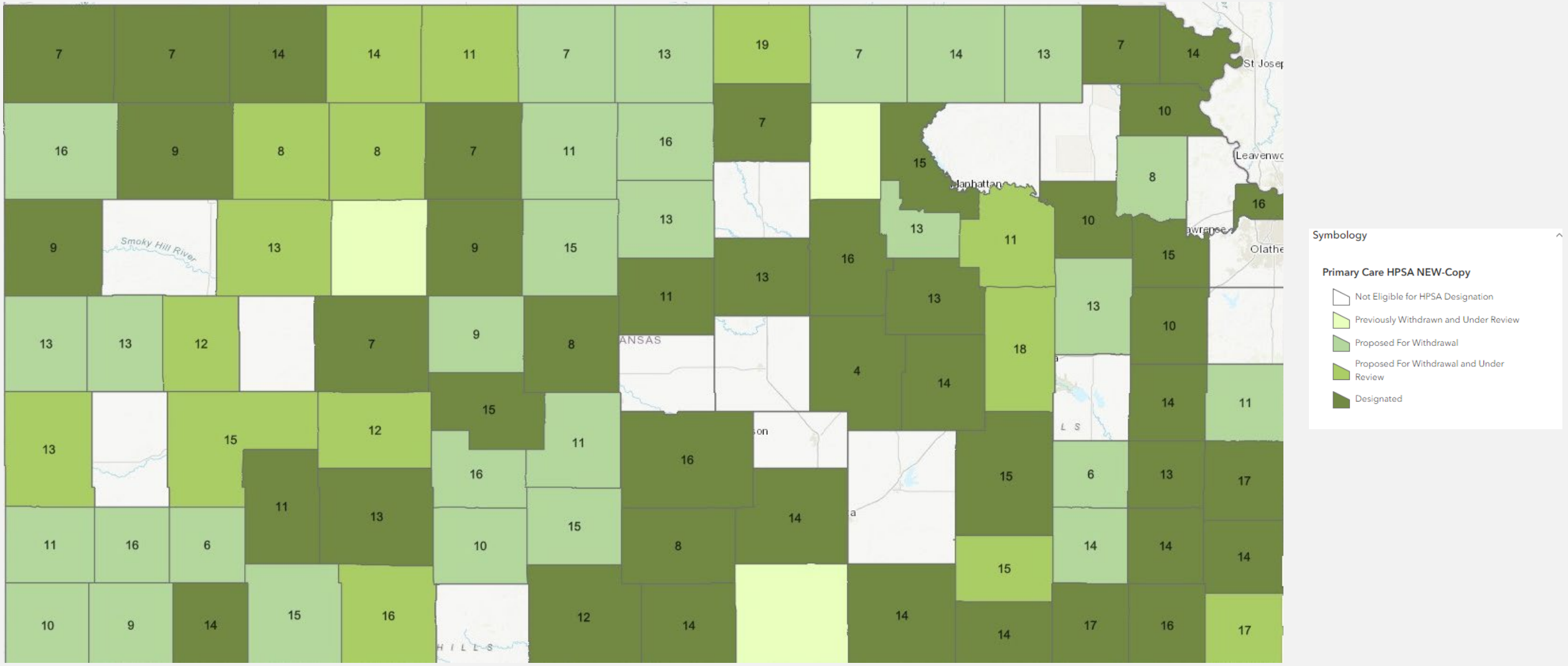
HRSA Primary Care : Health Professional Shortage Areas- KANSAS

Source: Kansas Department of Health and Environment-
https://services9.arcgis.com/Q6wTdPdCh608iNrJ/arcgis/rest/services/Primary_Care_HPSA_NEW/FeatureServer



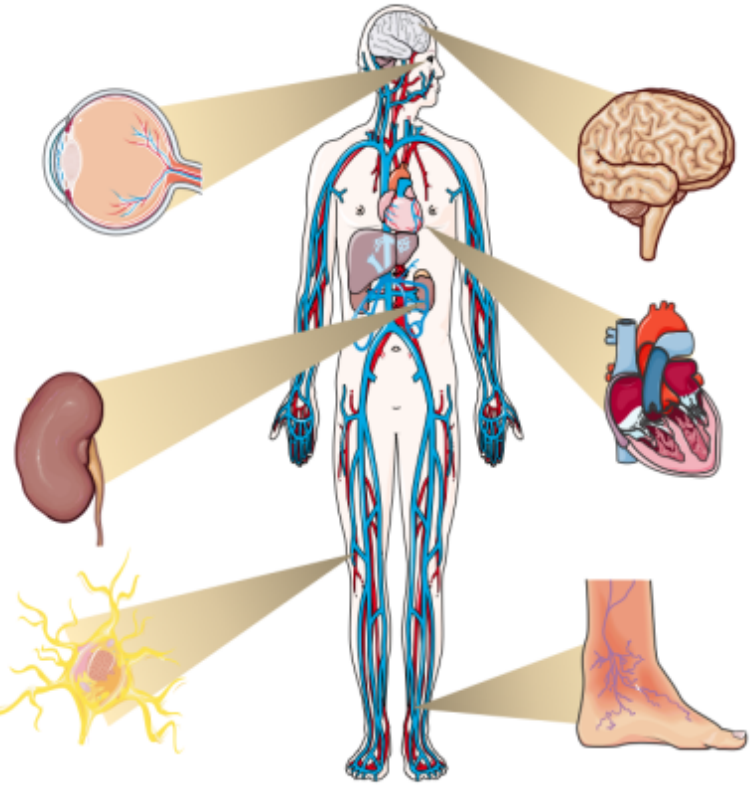
Major Complications of Diabetes

Microvascular

Eye
High blood glucose and high blood pressure can damage eye blood vessels, causing retinopathy, cataracts and glaucoma

Kidney
High blood pressure damages small blood vessels and excess blood glucose overworks the kidneys, resulting in nephropathy.

Neuropathy
Hyperglycemia damages nerves in the peripheral nervous system. This may result in pain and/or numbness. Feet wounds may go undetected, get infected and lead to gangrene.



Macrovascular

Brain
Increased risk of stroke and cerebrovascular disease, including transient ischemic attack, cognitive impairment, etc.

Heart
High blood pressure and insulin resistance increase risk of coronary heart disease

Extremities
Peripheral vascular disease results from narrowing of blood vessels increasing the risk for reduced or lack of blood flow in legs. Feet wounds are likely to heal slowly contributing to gangrene and other complications.

Source: Jennifer Jiang, Dr. Shuchismita Dutta; Reviewed by Drs. Stephen Schneider and Stephen K. Burley
doi: 10.2210/rcsb_pdb/GH/DM/monitoring/complications_2017_04,rcsb.org

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SIGNIFICANCE OF THE PROBLEM

- Type 2 diabetes is a major public health concern disproportionally affecting underserved populations

Prevalence by Race/Ethnicity:

- ✓Native Alaskan: 14.5%
- ✓Black/African American: 12.1%
- ✓Hispanic: 11.8%
- ✓Asian: 9.5%
- ✓Non-Hispanic White: 7.4%

- Source: Center for Disease Control & Prevention & 2018–2019 National Health Interview Survey, except American Indian/Alaska Native data, which were from the Indian Health Service National Data Warehouse (2019 data only).

- Uncontrolled, diabetes can lead to both macrovascular (e.g., coronary artery disease [CAD], stroke, lower-extremity amputations) and microvascular complications (blindness, renal or nervous system damage):

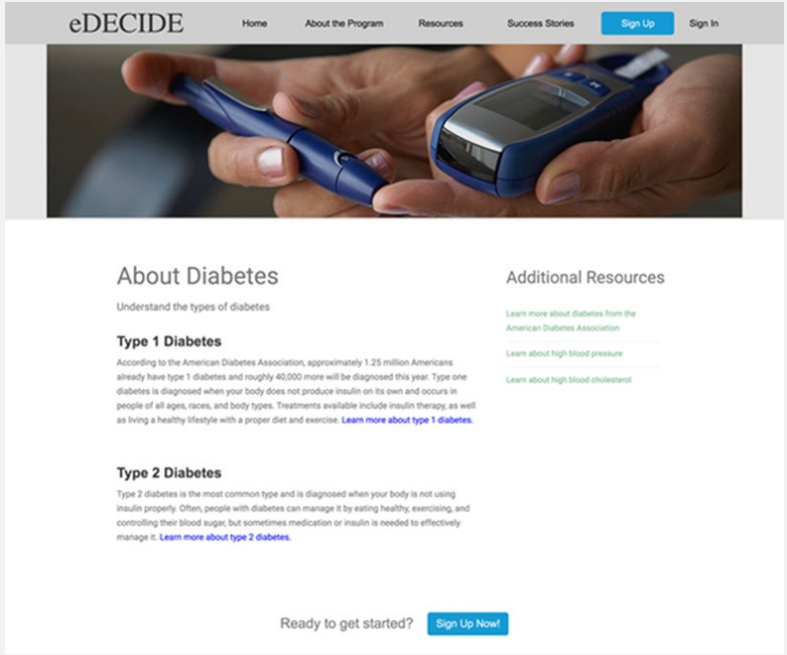
- ✓Higher microvascular complications
- ✓Poorer health status
- ✓Poorer glycemic control
- ✓Suboptimal clinical measures (A1c, BP, LDL)

UPTAKE OF DIABETES SELF-MANAGEMENT PROGRAMS/EDUCATION BY PATIENTS (CHATTERJEE ET., AL., 2018)

- In the United States, 5-8% of patients attend DSME
- Common barriers:
  - Access
  - Educational setting
  - Limited knowledge about available programs
  - Timing
  - Inconvenient venues
  - Duration of programs

BARRIERS TO SELF-MANAGEMENT

- Behaviors centered on dietary factors
- Physical activity barriers
- Medication adherence
- Glucose monitoring



PROGRAMS W/PROBLEM-SOLVING COMPONENTS

Study-	Study Design/ Primary Outcomes	Main Findings
Trief et al (2013)	Underserved Medicare patients N=1165 PS Component: Taught within larger curriculum Intervention: Telemedicine Case Management Control: Usual Care	Baseline to 5-year follow-up: Improvements in diabetes self-care over time Improved adherence (intervention grp) A1c was a mediating factor
Tang TS, et al. Self-management support in "real-world" settings: an empowerment-based intervention. *Patient Educ Couns*. 2010; 79(2): 178-184		Post-intervention: Modest improvements in glycemic control (8.2% vs. 7.6%, p<.001)
Glasgow RE, et., al. (2009). Reach and effectiveness of DVD and in-person diabetes self-management education.	Hybrid preference RCT design -In person Class vs. DVD DSME (selection vs. randomly assigned would impact results)	▪ Few differences in DSM behaviors Med Adherence-Class/less compliant ▪ No difference-on Problem-solving/or other behaviors ▪ No difference on clinical indicators

DIABETES PROBLEM-SOLVING STUDIES: SYS REVIEW
(FITZPATRICK ET AL., 2013)

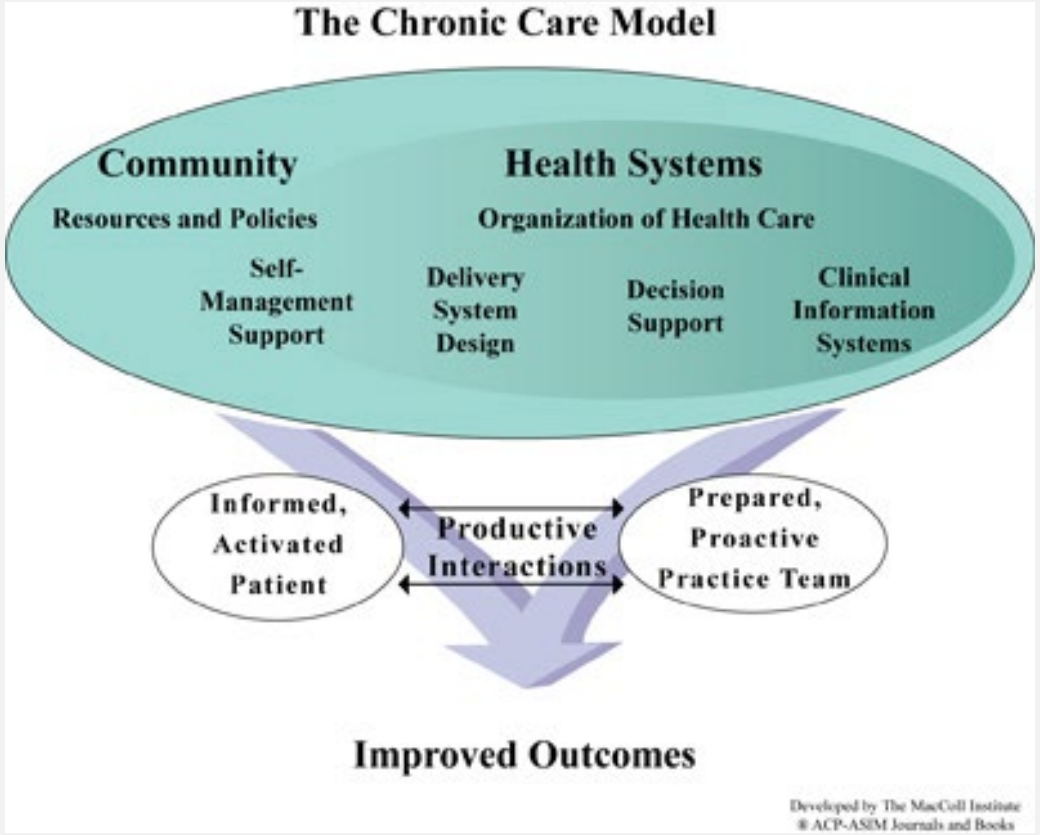
Study Description	Measures PS	Impact on HbA1c	Impact on Behavioral
▪ 11 RCT ▪ 6 Quasi-Exp **Stand Alone PS:** ▪ One study: Hill-Briggs et al (2011) **Components of PS within Intervention:** ▪ 16 Adult ▪ 7 Children/ Adolescent	▪ 1-study PS curriculum ▪ 5- studies, PS was part of the intervention ▪ 7- studies PS was utilized for goal-setting or action planning ▪ 3 studies -only used a problem-solving support group	7 studies reported significant improvements in HbA1c (-0.09 to -0.93) between 3 -12-month follow-up	▪ Six studies reported significant impact on following a healthy diet ▪ PS improvement-3-month follow up

SOLUTIONS

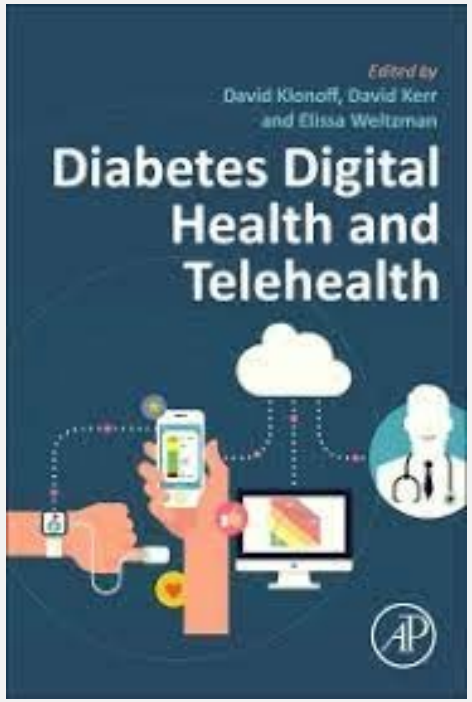
- Adopting a Chronic Care Model
- Problem-solving training
- Improving access to telemedicine
- Community Health Workers

THE CHRONIC CARE MODEL (WAGNER ET AL.,

- Link to resources
- Collaboration with Healthy System
- Improved Outcomes
- Increased access to care

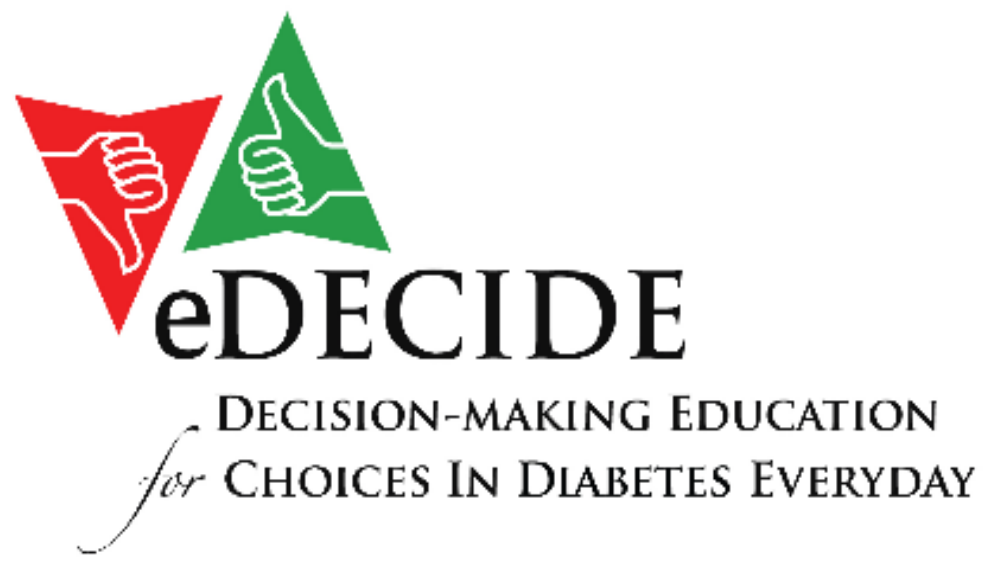


TELEMEDICINE – USE OF TECHNOLOGY



Problem-solving as Technique

Managing type 2 diabetes is challenging and poor self-care behaviors can lead to further disease complications resulting in significant health outcomes. Problem-solving is a viable solution to improving self-care behavior. One approach to helping those living with diabetes is DECIDE, Decision-Making, Education for Choices in Diabetes Every Day,© a problem-solving approach.[3]



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PROBLEM-SOLVING SKILLS TRAINING (PSST)

- Problem-solving is part of the core 7 self-management tools (American Association of Diabetes Educators)

What PSST Does:

- Identify problems
- Identify challenges & barriers
- Provides skills in how to solve problems

Components of PSST:

1. **Problem-solving skill**: Approach to solving problems (rational, avoidant, etc.)
2. **Problem-solving orientation**: Positive or Negative
3. **Disease Specific Knowledge:** Working knowledge about their disease regimen
4. **Transfer of Past Experience:** Transferring knowledge from experience or learned skills

Replication of DECIDE

DECIDE: Decision-Making Education for Choices in Diabetes Everyday

- In-person group sessions/Expanded
- Problem-solving skills
- ADA recognized diabetes support program

American Diabetes Association.

Felicia Hill-Briggs
Senior Director of Population Health Research and Development
Professor of Medicine
Johns Hopkins HealthCare, LLC

JOHNS HOPKINS MEDICINE

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Collaboration!

WHY E-DECIDE?

- Currently Traditional DECIDE is delivered in several formats:
  - In-person group setting
  - Enhanced Individual self-study
  - CD
  - Telehealth

What is Missing:

- Digital online versions of DECIDE

- Will eDECIDE be easier to access or more efficient for patients?
  - Undetermined
- Will eDECIDE be better for some patients in certain settings?
  - Undetermined

Project Goals

Overall Goals

- Lower A1c- to controlled levels
- Increase problem-solving skills to empower the patient
- Improve overall related CVD health outcomes
- Improve access

Immediate Goals

Achieve	Design	Create
Achieve a User-centered approach for the eDECIDE website	Design with participant input	Create the eDECIDE website for ease of use and access for community populations

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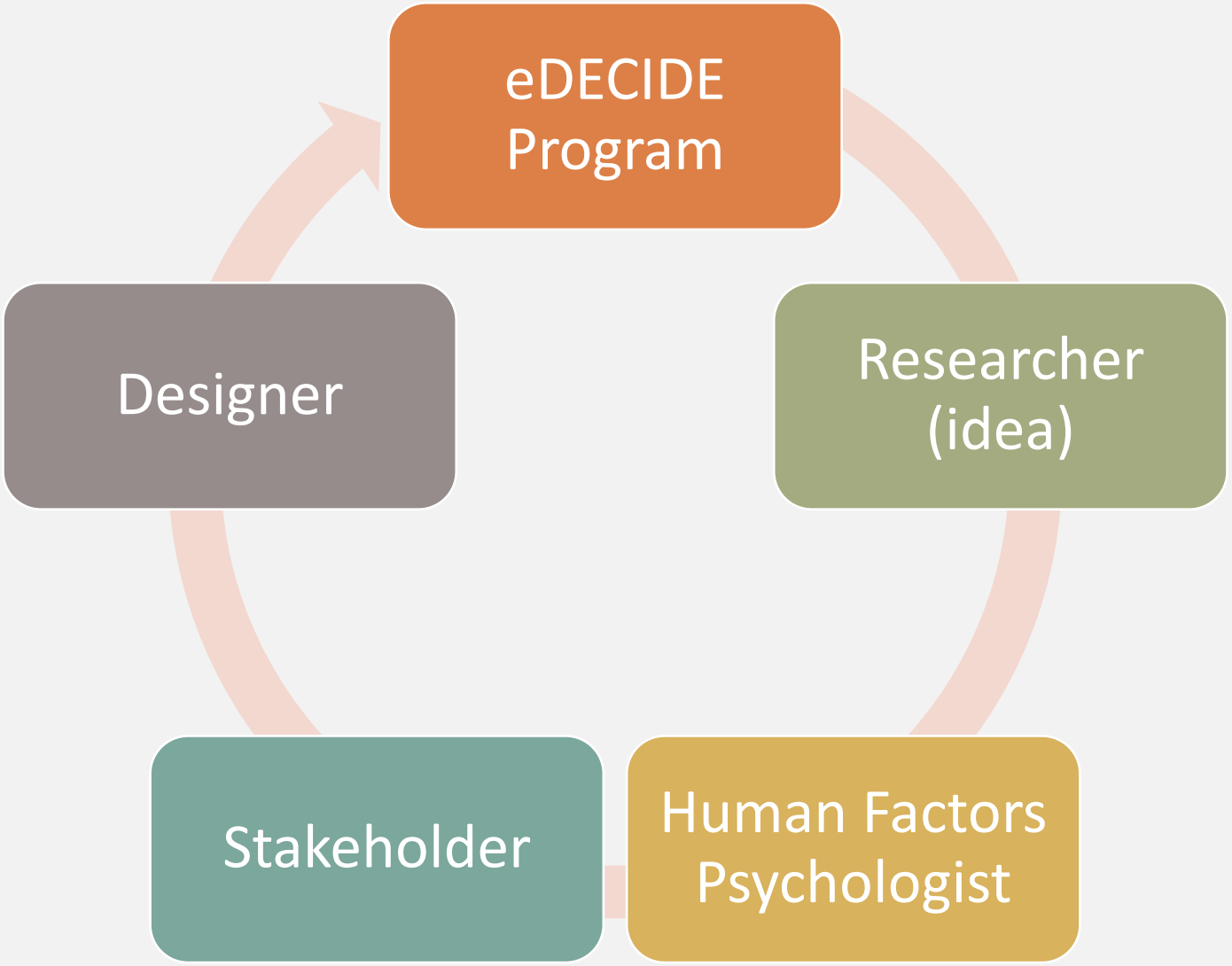
Multidisciplinary Approach



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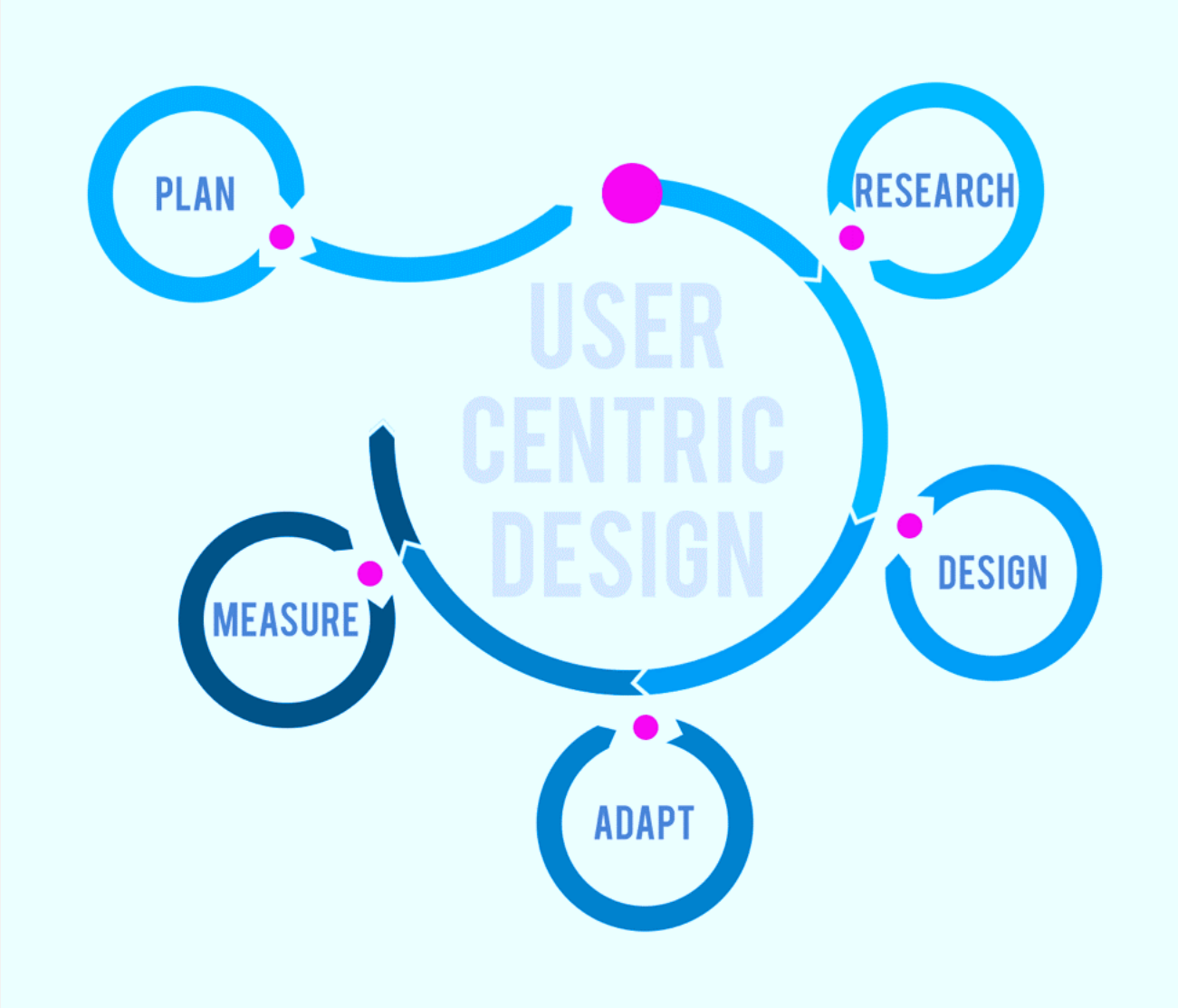
User Centered Design



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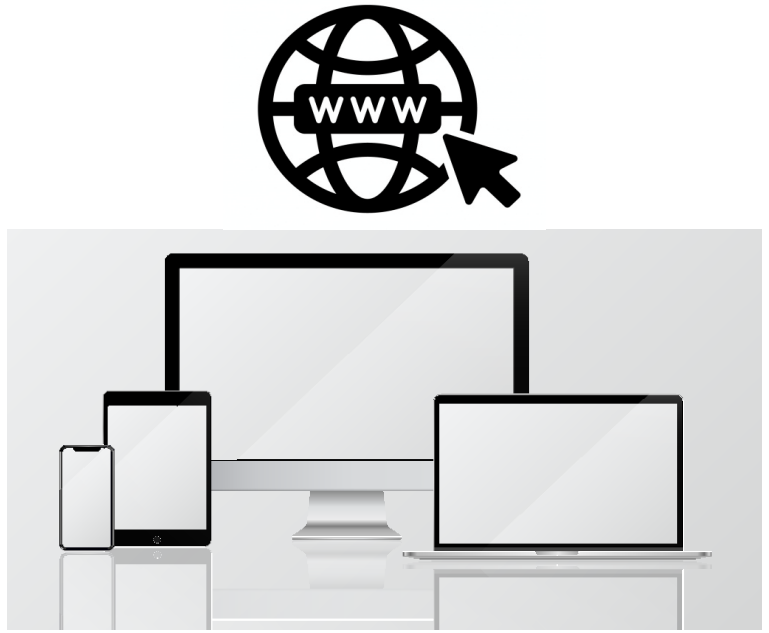
Replication of DECIDE

Phase I & II: Task Analysis; Completed

Aim 1: To translate and design the **DECIDE** curriculum into a user-centered web-based program, **eDECIDE** using a Task Analysis Approach



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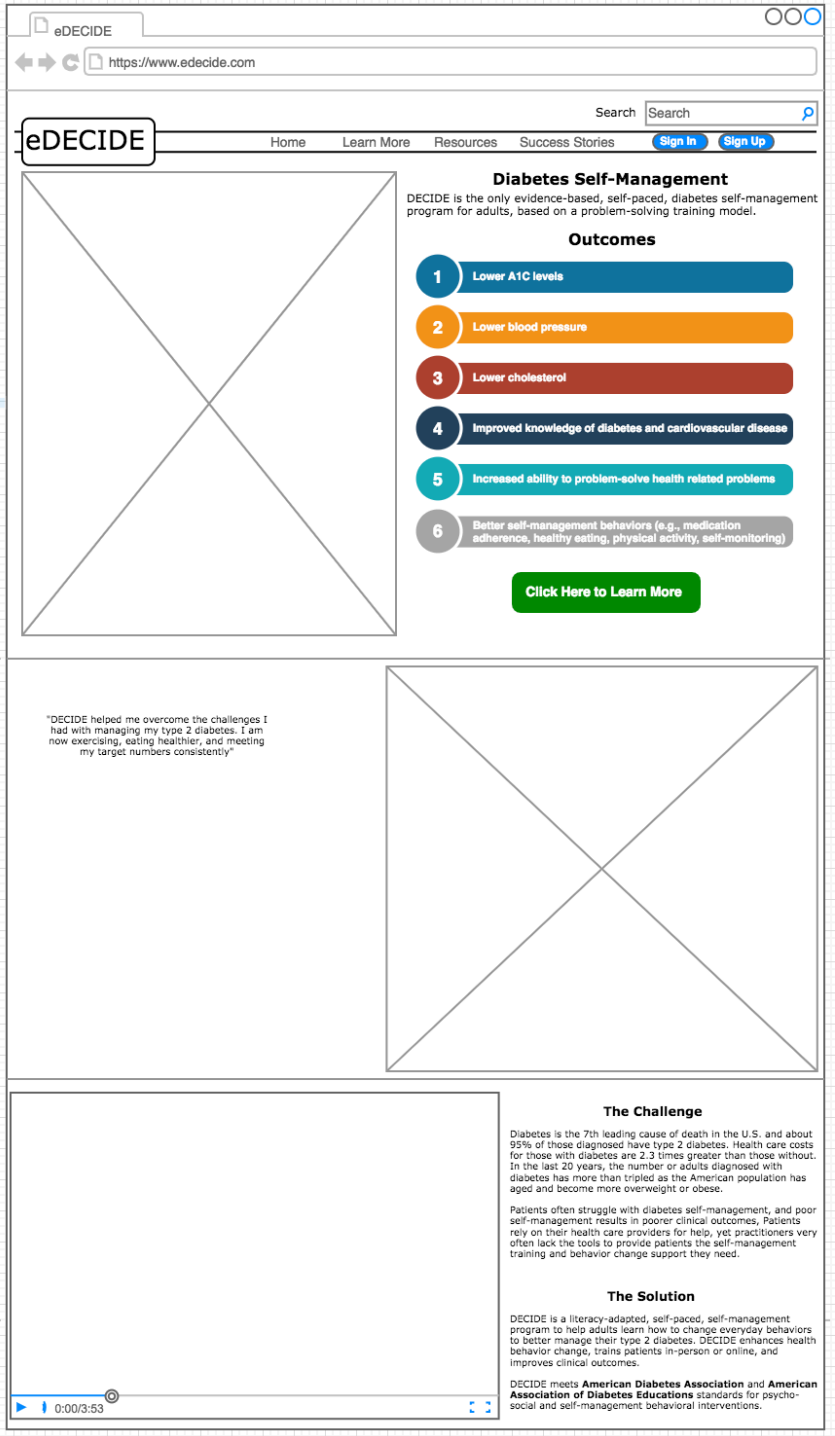
Homepage Mockup



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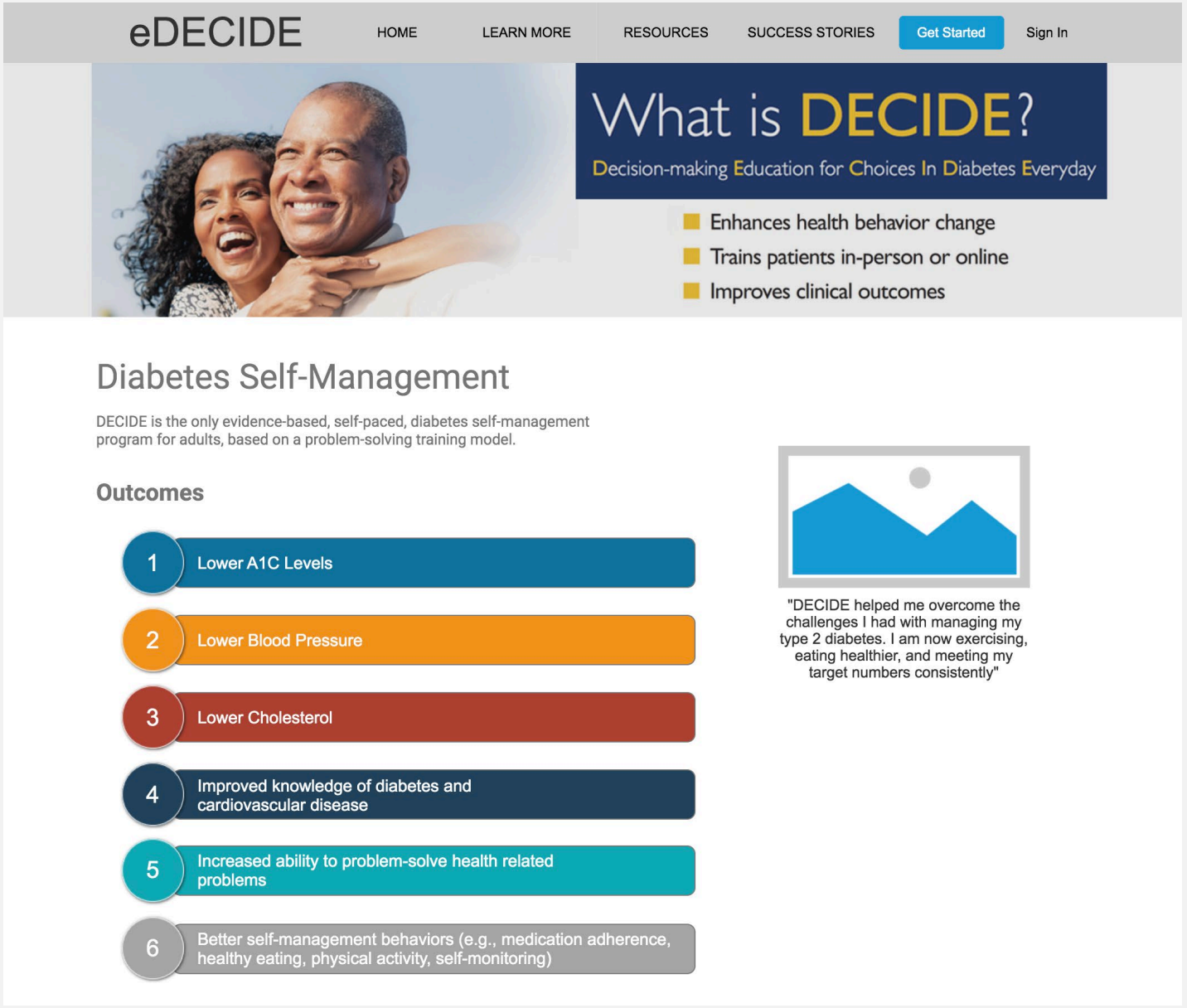
Prototype: Homepage



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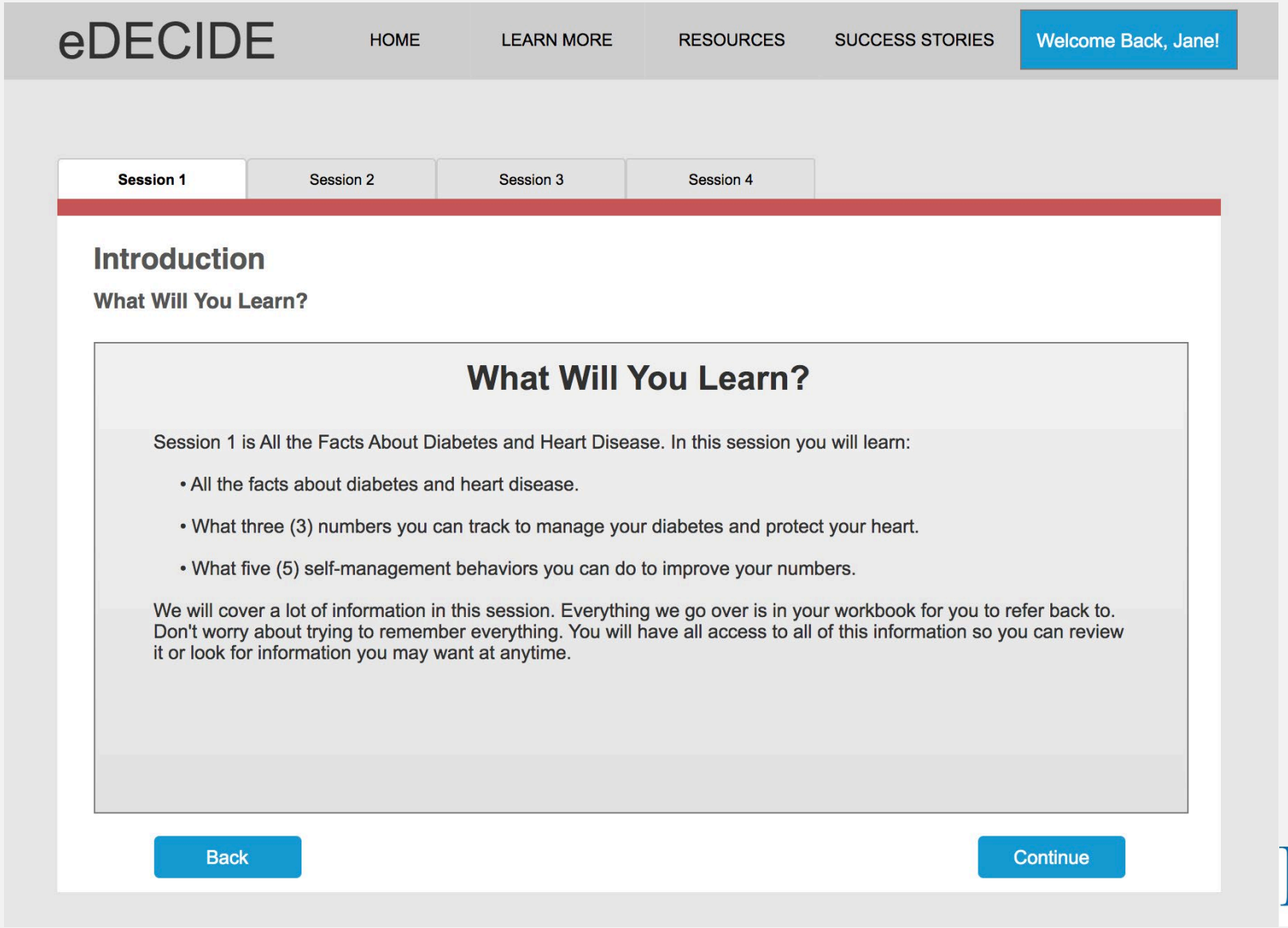
Prototype: Session



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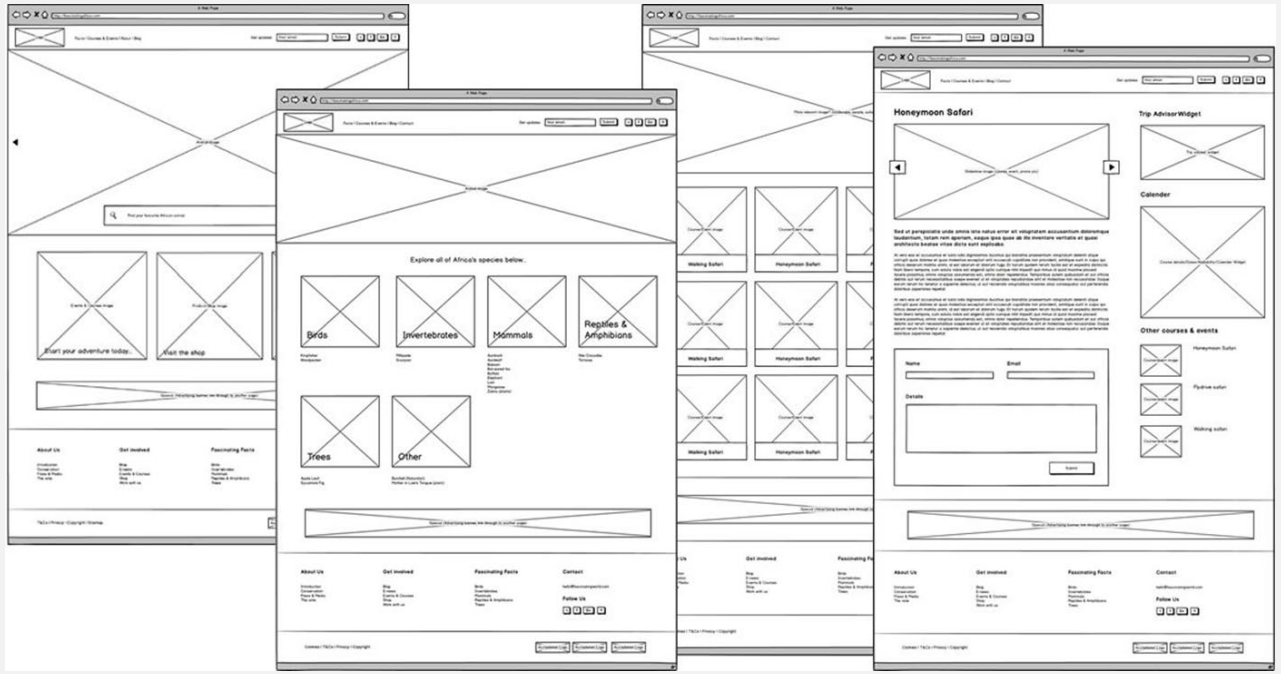
Usability Testing for eDECIDE

Phase II: Usability Testing, Completed

Aim 2 : To assess patient usability and satisfaction with **eDECIDE** prototype design



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Usability Testing of eDECIDE| Process

90-Minute Remote Zoom Sessions

Setup

Order

Website overview
- First Impressions/Reaction Cards
- About the Program/Resources pages

eDECIDE Session 1
- Sign-in process
- Dashboard impressions
- Session 1 walkthrough
- Final Impressions/Reaction Cards

Final interview/debrief

Usability testing results

Usability Testing Participant Description:

- N=11 adults
- (3 males, 8 females)
- Average age: 45
- African American
- Type 2 diabetes

Information Collected:

- Qualitative Interview
- Overall feedback on website design
- Completed the System Usability Scale-user perspective feedback

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First Impressions | Microsoft Reaction Cards

First Impressions | Home Page

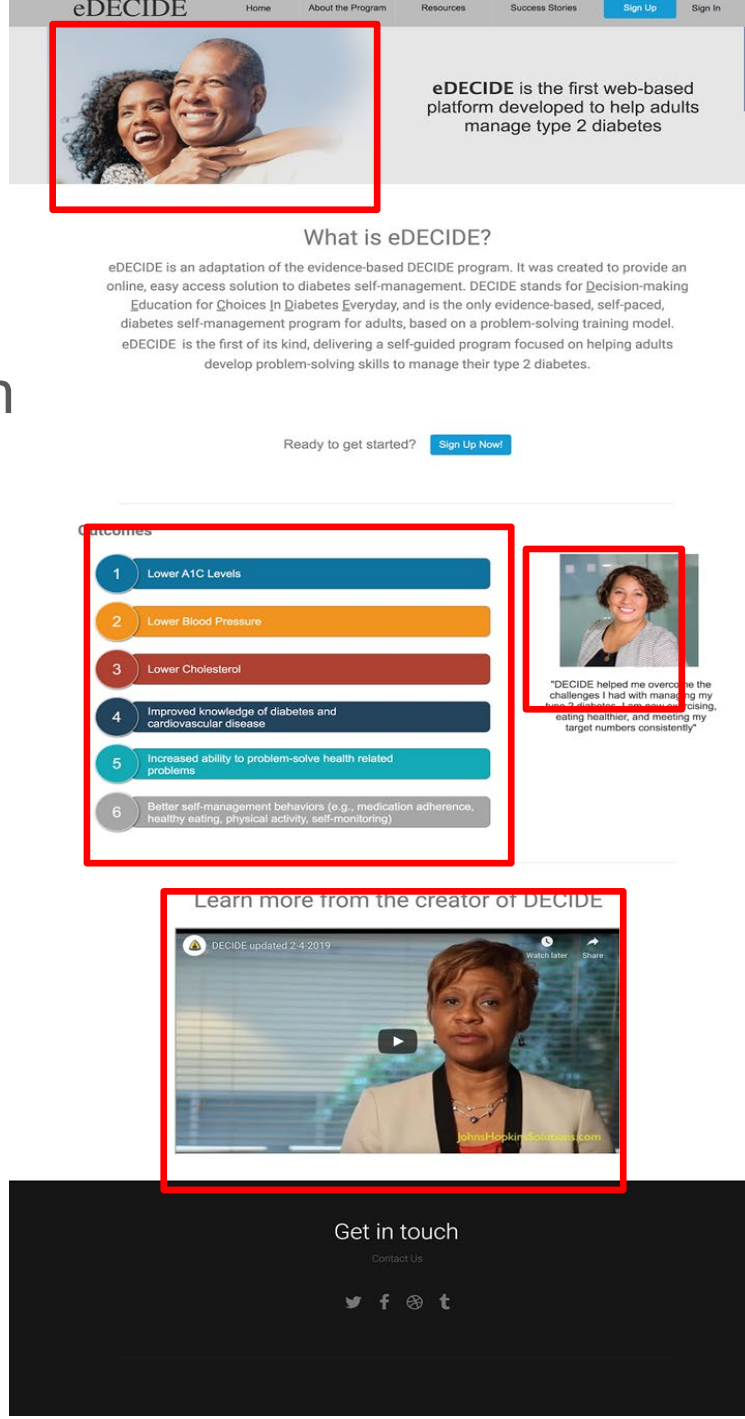
Almost all users stated the website was clean and easy to read

A few users indicated they would click on the video at the bottom of the page

Most users expected that it was target to older adults, based on the images used with some recommendations:

"I like the key about helping manage type 2 diabetes. It's self-explanatory looks good. I think they should put different pictures of deiffernst ages. They always want to show Diabetes for those over 50, not necessarily true"

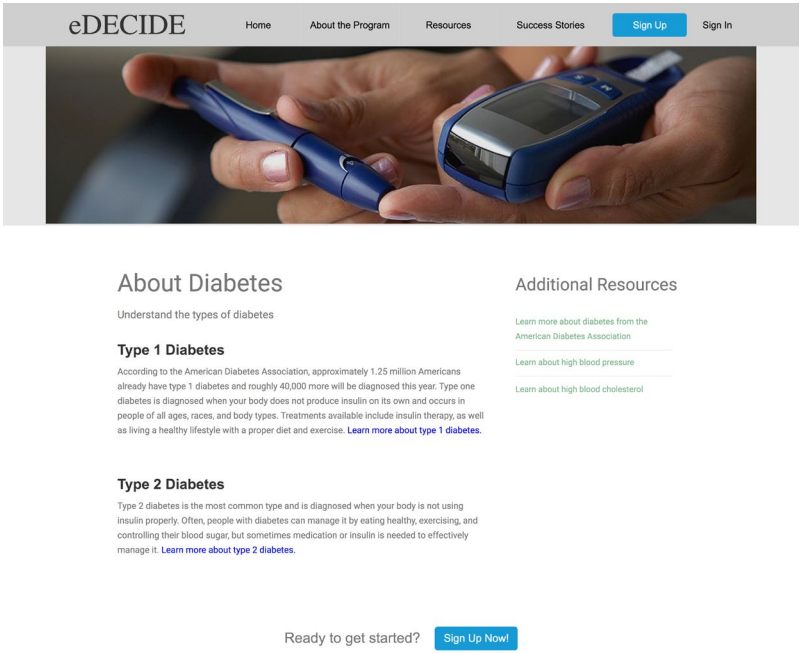
-eDECIDE Usability Study Participant, Female 45 yrs old



Content | Diabetes

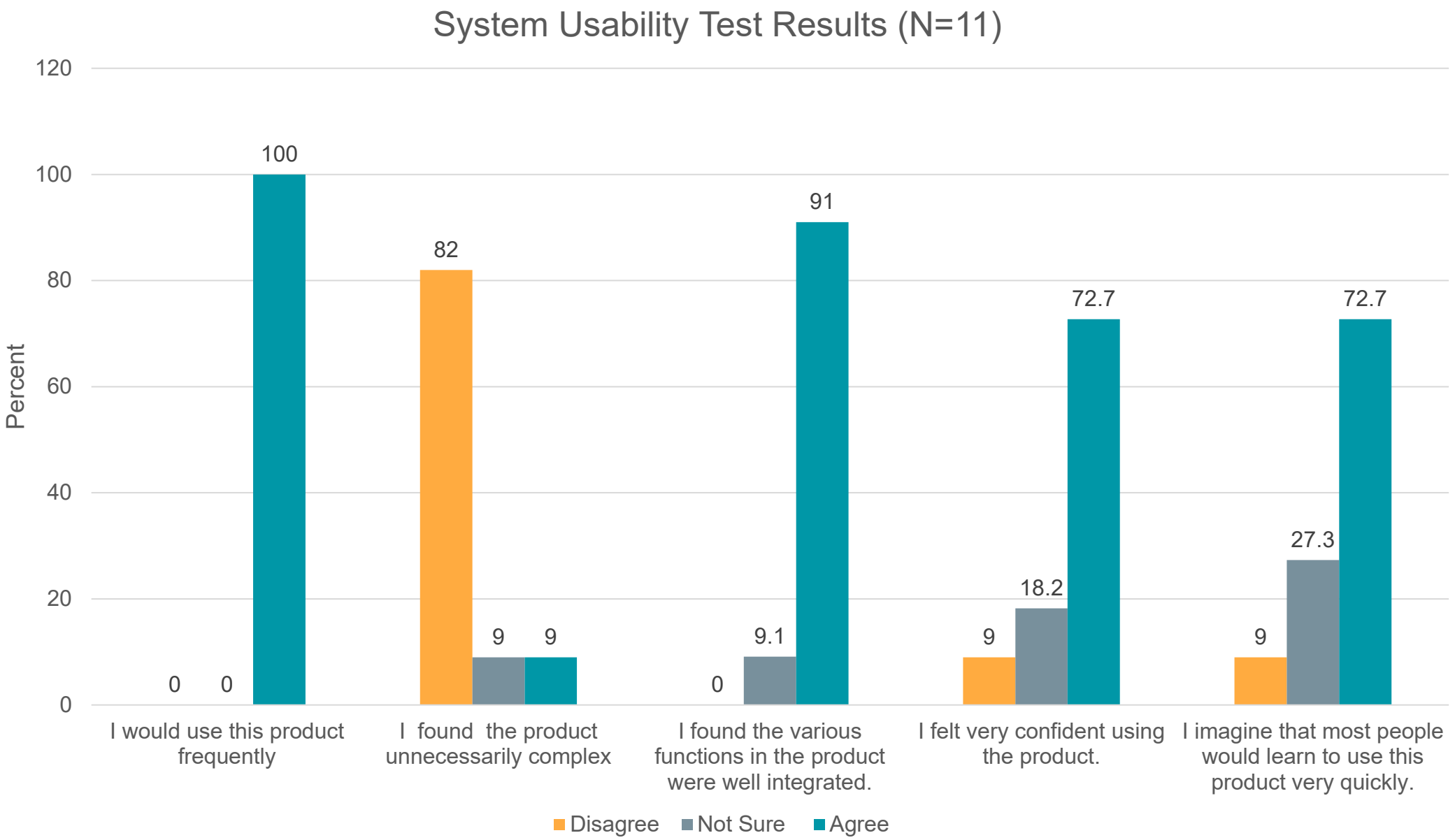
All users were interested in the information provided about diabetes, regardless of their current knowledge

- Some users indicated it was nice to have a reminder of things they should be concerned with



"You can get help in knowing what type 2 dm is and how to manage it. Any problems that you may have or information that you don't know. You can probably find it here"

-eDECIDE Usability Participant, Male 65 years old


System Usability Test Results (N=11)
120
100
80
60
40
20
0
Percent
0
0
100
82
9
9
0
9.1
91
9
18.2
72.7
9
27.3
72.7
I would use this product frequently
I found the product unnecessarily complex
I found the various functions in the product were well integrated.
I felt very confident using the product.
I imagine that most people would learn to use this product very quickly.
Disagree
Not Sure
Agree

eDECIDE Intervention

Aim 3 : To test **eDECIDE** in a pilot 18-week RCT (n=70), measuring change in HbA1c (primary outcome) and blood pressure, cholesterol, problem-solving skills, Diabetes and CVD Knowledge, Nutrition, and Diabetes Self-Care behaviors, patient-provider communication. (Phase III Summer 2021)

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E-DECIDE INTERVENTION

Year 3 Pilot Study

- Randomized Pilot Clinical Trial
- 70 participants:

✓35 randomized to the intervention arm

✓35 randomized to the control arm (usual care/DECIDE Self-study group)

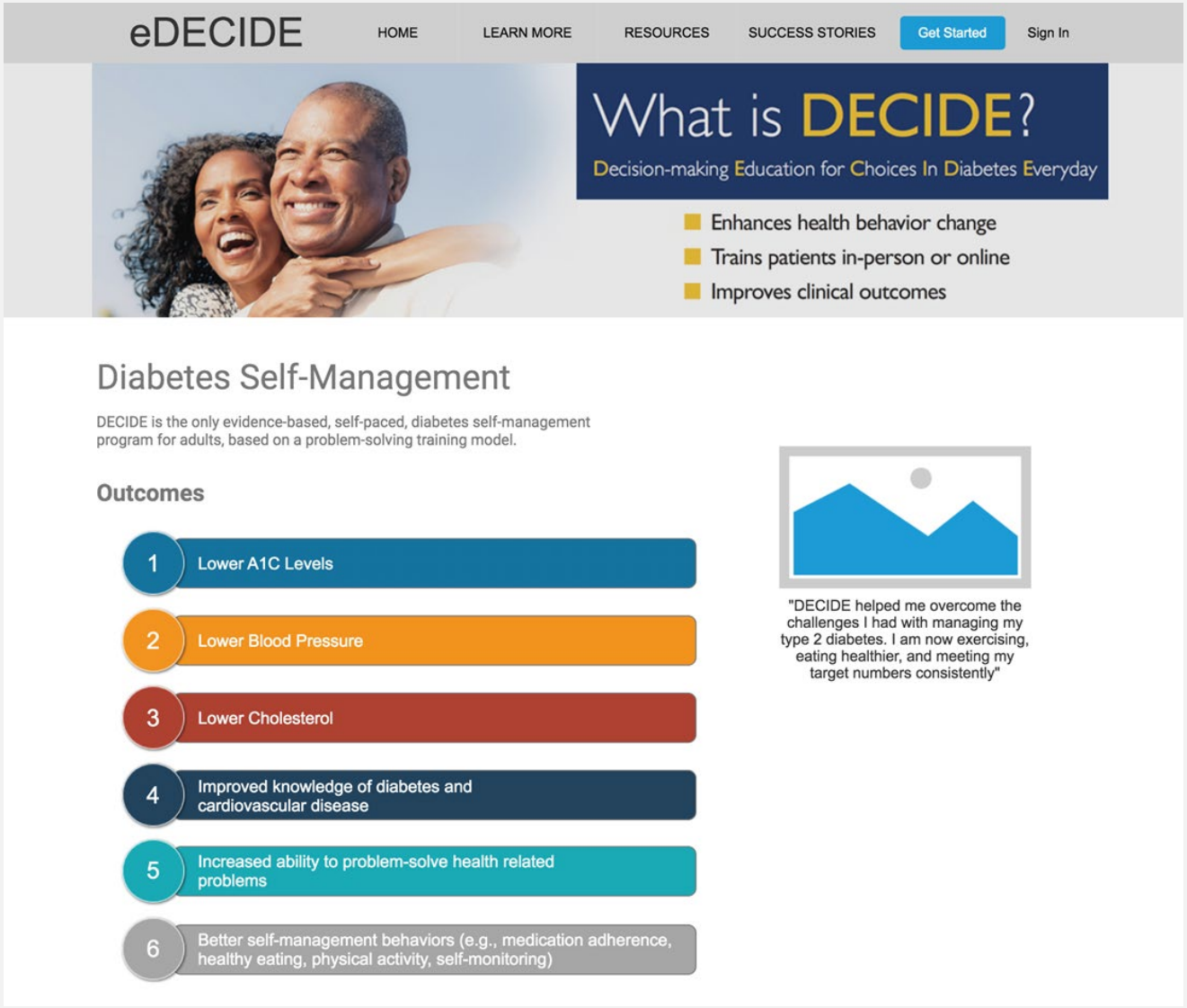
- Recruitment: AA, A1c >7.0%, 18 yrs., clinic populations at KU Internal Medicine Faculty Clinic (Dr. Robert Badgett) & Community-wide recruitment

Primary outcome:
HbA1c

Secondary outcomes:
-Problem-solving skills
-CVD Knowledge
-Diabetes Self-care measures

ANTICIPATED IMPACT

eDECIDE will provide a new modality for delivering targeted problem-solving skills education and help reduce disparities related to uncontrolled diabetes in African American populations.



INTERVENTION CHALLENGES WITH DIGITAL HEALTH STUDIES

- Sustainability of outcomes
- Access to the Internet
- Literacy
- Group Dynamics of delivering eDECIDE

Future Directions & Considerations

- eDECIDE Mobile Phone App
- Targeted community-based interventions using eDECIDE
- Opportunities for collaboration

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THANK YOU & QUESTIONS