Democratizing Discovery Health with n = Me
Primary care, Promoting Quality Care, Longer Lives
Elizabeth Ofili, MD, MPH
Professor, Department of Medicine
Senior Associate Dean, Clinical and Translational Research
Morehouse School of Medicine

We are on a mission.
Disclosures

• Patent: A system and Method for Chronic Illness Care System and method for chronic illness care (US 20100017229 A1 ; US8234131 Issued)

• AccuHealth Technologies Inc. (Faculty Start up)
Meet FNO
76 yo with HTN
Dx Diabetes, (A1C 11)-Nov 2011
Meet: Frankie Health Coach
Six months later: lost 25 pounds
A1C 5.5
Off metformin
BP 116/69 on two medications
Monitors, BP and glucose daily
Walks/Tracks 2-5 miles 6 days/wk
Low Health Literacy ~ Complicates Chronic illness care

Low Health Literacy is A $200 Billion Problem

Health literacy is defined in the Affordable Care Act (ACA) as “the degree to which an individual has the capacity to obtain, communicate, process, and understand health information and services in order to make appropriate health decisions.”

Only 12 percent of Americans are proficient in understanding and acting on health information (Koh et al., 2013; Kutner et al., 2006).

More than half of American adults have low health literacy; minorities, the elderly, and those with lower educational attainment and socioeconomic status are disproportionately affected.
Community Engagement: Atlanta CTSA And RCMI Collaboration

Pemu PE et al. Socio-demographic psychosocial and clinical characteristics of participants in e-HealthyStrides©: an interactive ehealth program to improve diabetes self-management skills. J Health Care Poor Underserved. 2011;22(4 Suppl):146-64
What is Health360x?

Health360x empowers you to manage your health with the help of your physician and a health coach.

- View, record and print your health data.
- Self manage your health through your mobile app.
- Connect with physicians, health coaches & community members.

http://community.health360x.com/index.php/15-what-is-health360x
Sounds good... how do I use it?

- View, record and print
  - Height & weight
  - Blood pressure
  - Blood glucose
  - Fitness activities
  - Nutrition
  - Manage medications

- Access all the features of Health360x through your mobile device. Available for both Apple iOS and Google Android enabled smartphones.

- Set goals with AADE7 and gain access to the online curriculum. All designed to help you in your journey to better self-manage your health.

- Connect with our online community through groups, online discussions. Get updates on upcoming community events and current studies.
Accessing your information safely & securely

Web Browser

Mobile App
Connecting beyond a visit.

Physicians, researchers and health coaches can view patient data.

e-Patient's can keep their selected doctor and health coach updated with current health information.

Health 360x
Obesity and Heart Health: Activity, Nutrition, Medication adherence

Heart Health
- Diabetes
- Heart
- Nutrition
- Weight
- Social Network
- Medication

COMING SOON: Clinical Trials

Fitness +
GPS, Calories Burned

Confidential
Mobile Heart Health Management

Animated & color coded guidance

History of the 60 most

Graph of the 60 most recent

Data evaluated for trends

Blood Pressure Graph

AccuHealth Technologies Inc.
Theory-Based behavioral Change

• Health360x is a patient-centered Consumer Health information Technology (CHIT) application.

• It incorporates constructs from the model of supportive accountability and COM-B system.

• Intervention elements are education, monitoring with tailored in-the moment feedback, persuasion, modeling, enablement and incentives.
  – These elements directly affect an individual’s capability, opportunity and motivation for behavior change
  – Health coaches’ involvement drove engagement because of accountability, bond and legitimacy

Pemu et al

https://www.ucl.ac.uk/pwp-review/docs/PWPREVIEW-behaviour_change
# Conceptual Framework

<table>
<thead>
<tr>
<th>Health360x elements</th>
<th>Mechanistic linkage</th>
<th>Intervention Elements</th>
<th>COM-B behavioral constructs</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum</td>
<td>Engagement</td>
<td>Education</td>
<td>Capability</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
<td>Persuasion</td>
<td>Physical or psychological</td>
<td></td>
</tr>
<tr>
<td>Tailored in-the moment feedback</td>
<td></td>
<td>Training</td>
<td>Opportunity</td>
<td></td>
</tr>
<tr>
<td>Social Networks</td>
<td></td>
<td>Modeling</td>
<td>Social or physical</td>
<td></td>
</tr>
<tr>
<td>• Videos/ Skill building</td>
<td></td>
<td>Incentive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I-stories</td>
<td></td>
<td>Enablement</td>
<td>Motivation</td>
<td></td>
</tr>
<tr>
<td>• Competition s/prizes</td>
<td></td>
<td></td>
<td>Automatic and Reflective</td>
<td></td>
</tr>
<tr>
<td>• Personal profiles and illness biographies</td>
<td></td>
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</tr>
</tbody>
</table>

![Conceptual Framework Diagram](image)
Who Used Health 360x? n=297

- Average age was 62.1± 13.81 years
  - 44% were ≥ 65 years old
- 70% were female
- Mean BMI was 33.76 ± 8.13
  - 64% were obese; 30% overweight
- 19.8% were diabetic less than 2 years
- 14% for 2-5 years
- 66% were diabetic for more than 5 years

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What Did We Learn?

Blood pressure dropped significantly among participants

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Blood glucose improved significantly

Pemul et al
Participants exercised more

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Age and Ethnicity were not a barrier to engaged use of Health360x

<table>
<thead>
<tr>
<th>Age(years) x Usage(minutes online) n=138</th>
<th>&lt;25th percentile (%)</th>
<th>25+percentile (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-49</td>
<td>8 (5.8)</td>
<td>18 (13.0)</td>
<td>26 (19)</td>
</tr>
<tr>
<td>50-64</td>
<td>20 (14.5)</td>
<td>60 (43.5)</td>
<td>80 (57.9)</td>
</tr>
<tr>
<td>65+</td>
<td>8 (5.8)</td>
<td>24 (17.4)</td>
<td>32 (23.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P=0.64</td>
</tr>
</tbody>
</table>

Race/Ethnicity x Usage n =138

<table>
<thead>
<tr>
<th>Race/Ethnicity x Usage</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>134 (97)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (2.9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P=0.96</th>
</tr>
</thead>
</table>
Computer Ownership and Education did not impact engaged use of health360x

<table>
<thead>
<tr>
<th>Education (years) x Usage(minutes online) n=138</th>
<th>&lt;25th percentile (%)</th>
<th>25+percentile (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12 years</td>
<td>9 (6.6)</td>
<td>21 (15.3)</td>
<td>30 (21.9)</td>
</tr>
<tr>
<td>12 years to College+</td>
<td>27 (19.7)</td>
<td>80 (58.4)</td>
<td>107 (78.1)</td>
</tr>
</tbody>
</table>

\[ P=0.60 \]

<table>
<thead>
<tr>
<th>Own a Computer x Usage n =137</th>
<th>No</th>
<th>Yes</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>7 (5.1)</td>
<td>11 (8.0)</td>
<td>18 (13.1)</td>
</tr>
<tr>
<td>Yes</td>
<td>29 (21.2)</td>
<td>90 (65.7)</td>
<td>119 (86.9)</td>
</tr>
</tbody>
</table>

\[ P=0.19 \]
Self-Rated ability to Use a Computer and Ability to See Clearly were not Barriers to Engaged Use of Health360x

<table>
<thead>
<tr>
<th>Self Rated Ability to Use the Computer x Usage (minutes online) n=131</th>
<th>&lt;25th percentile (%)</th>
<th>25+percentile (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable 0,1,2</td>
<td>7 (5.3)</td>
<td>21 (15.9)</td>
<td>28 (21.2)</td>
</tr>
<tr>
<td>Able 3,4,5</td>
<td>25 (18.9)</td>
<td>79 (59.9)</td>
<td>104 (78.8)</td>
</tr>
</tbody>
</table>

\[ P=0.92 \]

<table>
<thead>
<tr>
<th>Able to See Clearly x Usage n =135</th>
<th>Agree/Strongly Agree</th>
<th>Disagree/Strongly Disagree/Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree/Strongly Agree</td>
<td>30 (23.6)</td>
<td>5 (5.9)</td>
</tr>
<tr>
<td>Disagree/Strongly Disagree/Neutral</td>
<td>80 (63)</td>
<td>12 (9.5)</td>
</tr>
</tbody>
</table>

\[ P=0.85 \]
Anxiety about ability to Use the Internet and Discomfort with Putting Health Information Online were significant Barriers to engaged Use of Health360x

| I Feel Anxious about my Ability to Use the Internet x Usage(minutes online) n=133 |
|-----------------------------------------------|-----------------|-----------------|-----------------|
|                                              | <25th percentile (%) | 25+percentile (%) | Total (%)       |
| No                                            | 17 (12.8)        | 72 (54.1)       | 89 (66.9)       |
| Yes                                           | 17 (12.8)        | 27 (20.3)       | 44 (33.1)       |
| P=0.015                                       |                 |                 |                 |

| I Feel Comfortable About Putting My Health Information on the Internet x Usage n =134 |
|---------------------------------------------------------------------------------|-----------------|-----------------|-----------------|
| Agree/Strongly Agree                                                          | 26 (19.7)       | 46(63)          | 72(54.6)        |
| Disagree/Strongly Disagree/Neutral                                             | 9 (6.8)         | 51 (38.6)       | 60 (45.5)       |
| P=0.006                                                                        |                 |                 |                 |
Our Group in Their Own Words...

• We conducted interviews to explore the experiences of users
• Interview transcripts were subjected to qualitative analysis
• Major themes: Empowerment and Engagement

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Theme 1. Empowerment
Awareness (35 references)

“...And even from uploading it, my last update – what was that? -- Monday, and I was looking over the graph.

It was telling me I guess my sugar was kind of high and it said that I need to reduce my salt intake.
So if being that – you know, if we really get into it and after we upload the information I noticed that it’s giving you information – different things you can do”
“....Yes, that’s good also, but I reckon the other thing, if you have more than one doctor here, that system right now – say like if you have other doctors that you’re seeing for - - say like a dermatologist or a foot doctor, something like that, if you could put that information in, that would be a preference. You’ll have all of that when you go do anything. You’ll have all that information right here on your screen for you”

“...I – I like getting on there, learning how to, you know, to key myself in and, you know, just getting familiar with the computer because I’m not no wiz when it comes to the computer though. I’m learning. I’m – I’m learning and I’m learning at the same time – learning about myself, uh, well, my diabetes, and I’m learning about the computer”
“....I think it make it more easier because a person that just – that don’t have it, they don’t really know how to talk to you and they really don’t know the understanding of it”

“....it does give you a sense because we’re all kindred spirits here with the same issue of being diabetic and then the other things that go along with that, and it tends to make you open and talk more about what’s going on because you’re talking to someone that understands and are going through the same thing. So it’s a very, very rewarding program. I thank God for this and the opportunity to have participated, and participating in this endeavor”
Theme 2. Engagement
Engaging with health coaches (21 references)

“...So my coach suggested that I bring a snack with me and eat it before I start walking, and sure enough, that helped me to control that blood sugar. But that was one of my goals and the other goal was to increase my activity, and again my coach suggested, had suggested that even before I set this as a goal, and the problem is those goals interact with each other, you know? The increase in exercise affected, dropped the blood sugar, but eventually I got it under control following a couple suggestions from my coach”

“....She inspired me to learn”

“....When I’d do things, she’d encourage me; when I didn’t, she didn’t scold me, but you know, that tone of voice – “Well, Sharon,” and I knew I had to get on the beat”
Conclusion

• Health360x improved health and self-management behaviors among African Americans

• The likelihood of being an engaged user was independent of age, years of education, computer ownership, self-rated ability to use the computer and previous computer use.
  – It was significantly related to anxiety about ability to use the internet and comfort with putting health information online

• Successful use of technology among Older African Americans requires a high touch component to ensure engagement with the technology

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Atlanta Health Officials Tackle Obesity In Minority Communities

By SEAN GARVEY

Rev. Dr. Jason Owen, president of the Community Advisory Board for the Clinical Research Center at Morehouse School of Medicine, talks on "A Closer Look" about obesity.

Credit Brenna Beech / WABE
Bringing Research to the Community: Mobile Research Unit
We are on a mission.

LEADING THE CREATION AND ADVANCEMENT OF HEALTH EQUITY

Teaming with the Community to Promote a Healthier Life Through the Greater Works of Research
Using Health Information Technology to Deliver Consumer Engagement and Empower Health Equity
Meet FNO
76 yo with HTN
Dx Diabetes, (A1C 11)-Nov 2011
Meet: Frankie eHS Coach
Six months later: lost 25 pounds
A1C 5.5
Off metformin
BP 116/69 on two medications
Monitors, BP and glucose daily
Walks/Tracks 2-5 miles 6 days/wk
Conclusions

• Diversity and inclusion in clinical research requires multilevel patient centered approaches
• Research networks like the RCMI that invest in the health of minority and underserved communities offer opportunities to link clinical research with health services
• Mobile technology, n=me intervention and social networks including coaching and peer mentoring are testable models of scientific discovery
• The model should support workforce diversity using a community based participatory and team science approach
Acknowledgements

1) The faculty, Staff and Trainees of the Clinical Research Center at Morehouse School of Medicine
2) The Community Advisory Board and Community Physicians Network of Morehouse School of Medicine
3) The Atlanta Clinical and Translational Science Institute (ACTSI)-Emory University, Morehouse School of Medicine, Georgia Institute of Technology, Grady Health System, Emory University Hospital, Children’s Healthcare of Atlanta and other ACTSI partners
4) Investigators, staff, trainees and community partners at the 18 RCMI Institutions and the RCMI Translational Research Network
5) PCORnet SCILHS Clinical Data Research Network
6) Investigators, staff and consortium partners of the National Research Mentoring Network
7) My patients and staff at Morehouse Healthcare

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Thank you!!!!

www.msm.edu

Leading the Creation and Advancement of Health Equity

#1 in Social Mission among US medical schools (Annals of Internal Medicine, June 2010)

We are on a mission.