Improving Health & Reducing Social Isolation Through Technology

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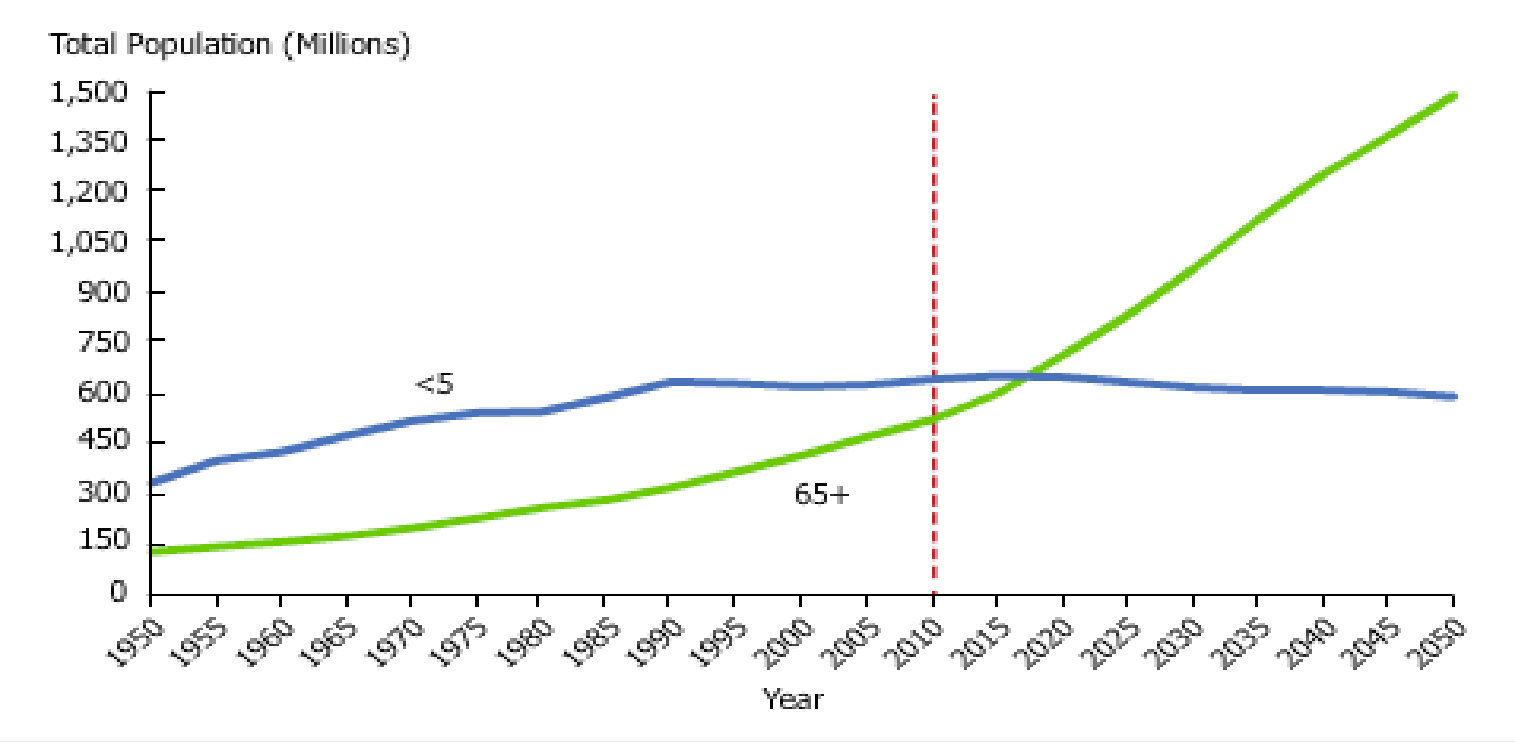
The Demographic Imperative

- **For the first time in history**, we are approaching a time when the world will have more people aged 65+ than under 5 years of age.

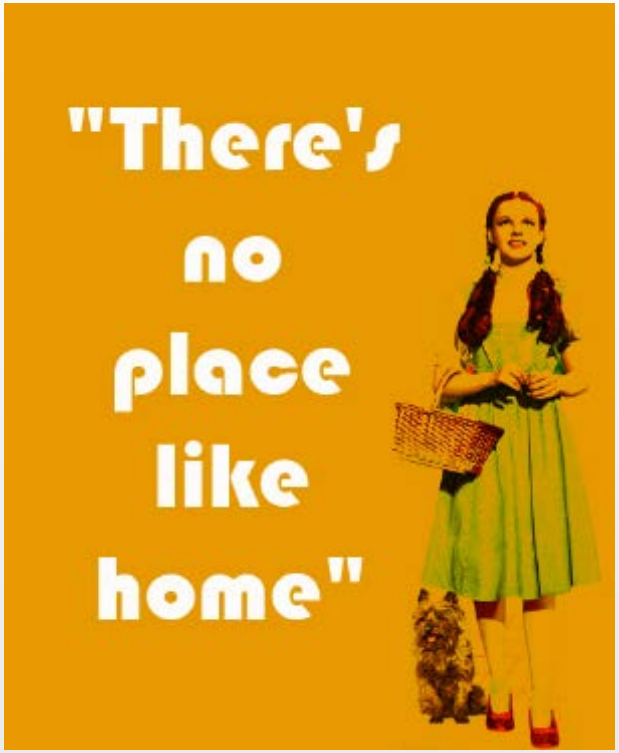


National institute on Aging: http://www.nia.nih.gov/

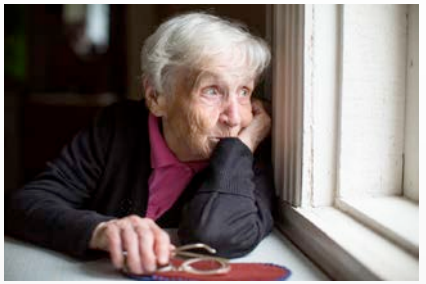
Critical Policy Concern

- Are we prepared to meet the health and social needs of an aging population, both now and in the future?

- "Aging in place" policy approach for aging well:
  - *"The ability to live in one's own home and community safely, independently, and comfortably, regardless of age, income, or ability level for as long as one is able, as one ages"* CDC, 2014



Social connection is a fundamental human need…



- **Prevalence of social isolation:**
  - More than 8 million older adults are affected by isolation.
    - Approximately 28% of Americans live alone;
    - More than 33% of adults over age 60 experience frequent or intense loneliness.

Sources: AARP's Connect 2 Affect, 2017, Retrieved from https://connect2affect.org/aboutisolation/; Ciolfi ML, & Jimenez F., 2017; Perissinotto, C.M., Stijacic C.I., & Covinsky, K.E., 2012.

A “Loneliness” Epidemic?

What is the cost of social isolation and loneliness?

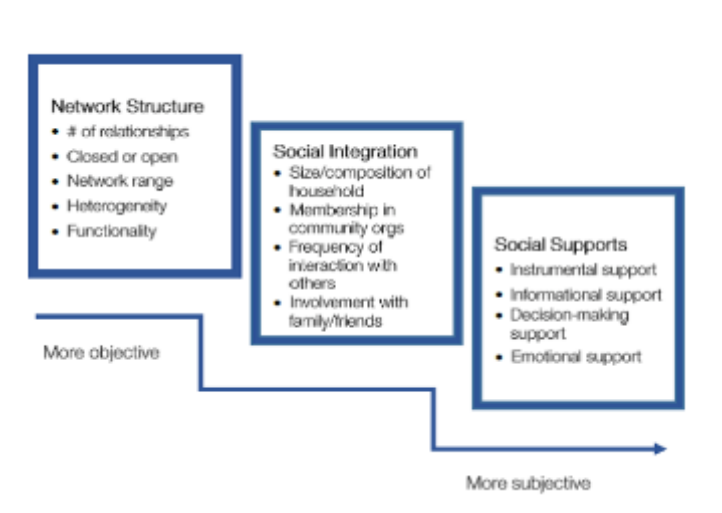
- Social isolation in older adults can lead to poor mental health, physical health, and to elder abuse.

- People with broader social networks, and who are active across multiple social groups:
  - Adjust to change better (Iyer et al., 2009)
  - Are more resilient (Jones & Jetten, 2011; Cohen et al., 1997)
  - Live longer (Holt-Lunstad, et al., 2010)

Social Isolation vs. Loneliness

Social Isolation

- Objective condition of physical isolation that prevents or limits the development and expansion of a diverse social network.



Loneliness

- Subjective experience of whether one's social relationships are "deficient in some important way, either quantitatively or qualitatively".

Source: Ciolfi, M.L., & Jimenez, F., 2017.

Risk Factors

- Living alone;
- Being age 80 or older;
- Having compromised health status, including having multiple chronic health problems;
- Having no children or contact with family;
- Lacking access to transportation;
- Living with low income;
- Changing family structures, younger people migrating for work and leaving older adults behind, and location of residence (e.g. urban, rural and remote); and
- Critical life transitions (e.g. retirement).

Accommodating a growing aging population…

- Technology can play a role in staying independent, maintaining well-being, and managing health.
  - A number of technologies are available (e.g., sensor-based networks for activity monitoring, emergency help systems, online tools to support older adults' self-management of chronic conditions)
- Overarching question remains: How to successfully implement technology aimed to meet the needs of a growing aging population and to support aging in place?

Source: Peek, S., Wouters, E., Luijkx, K., & Vrijhoef, H. (2016).

Evidence-based Technology Solutions for Social Isolation?

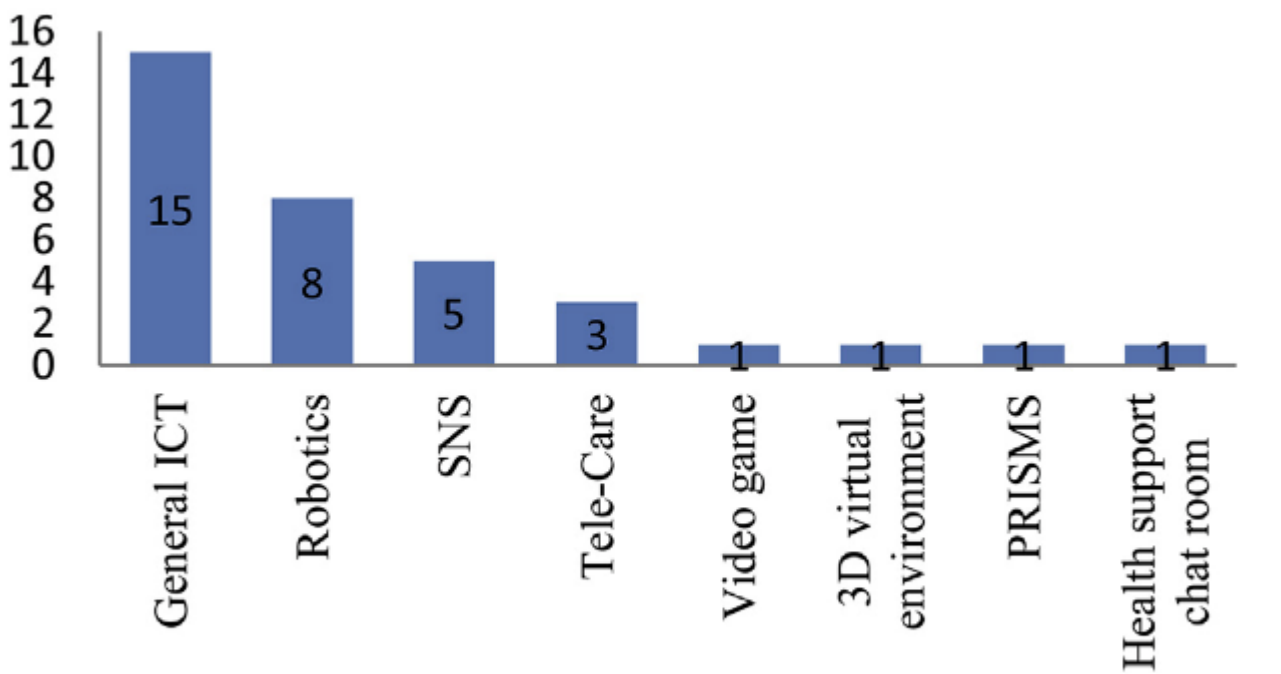


Fig. 4. Various technologies applied to alleviate social isolation/loneliness.

Source: Khosravi, P., Rezvan, A., & Wiewiora, A. (2016).

Implementation Outcome	Working Definition*	Related terms**
Acceptability	The perception among stakeholders (e.g. consumers, providers, managers, policy-makers) that an intervention is agreeable	Factors related to acceptability: (e.g. comfort, relative advantage, credibility)
Adoption	The intention, initial decision, or action to try to employ a new intervention	Uptake, Utilization, Intention to try
Appropriateness	The perceived fit or relevance of the intervention in a particular setting or for a particular target audience (e.g. provider or consumer) or issue	Relevance, Perceived fit, Compatibility, Trialability, Suitability, Usefulness, Practicability
Feasibility	The extent to which an intervention can be carried out in a particular setting or organization	Practicality, Actual fit, Utility, Suitability for everyday use
Fidelity	The degree to which an intervention was implemented as it was designed in an original protocol, plan, or policy	Adherence, Delivery as intended, Treatment integrity, Quality of programme delivery, Intensity or dosage of delivery
Implementation cost	The incremental cost of the delivery strategy (e.g. how the services are delivered in a particular setting). The total cost of implementation would also include the cost of the intervention itself.	Marginal cost***
Coverage	The degree to which the population that is eligible to benefit from an intervention actually receives it.	Reach, Access, Service Spread or Effective Coverage (focusing on those that need an intervention and its delivery at sufficient quality, thus combining coverage and fidelity), Penetration (focusing on the degree to which an intervention is integrated in a service setting)
Sustainability	The extent to which an intervention is maintained or institutionalized in a given setting.	Maintenance, Continuation, Durability, Institutionalization, Routinization, Integration, Incorporation

From: *Implementation research in health*. (2013). WHO.

- Implementation research is crucial to improving our understanding of the challenges in confronting the real world.
- Implementation of gerontechnologies is frequently unsuccessful in daily practice.

Sources: Baltza-Ozkan, Davidson, Bicket, & Whitmarsh, 2013**;** Doyle, Bailey, Scanaill, & van den Berg, 2014; Wilson, Hargreaves, & Hauxwell-Baldwin, 2015.

TSAP Community Collaborators:

Technology to Support Aging in Place (TSAP)

- TSAP is a remote client monitoring program emphasizing client education and chronic illness self-management.
- Program implemented by Area Agency on Aging & Disabilities (AAAD) in community settings.

Client assigned Bluetooth devices that transmit data to 2net hub

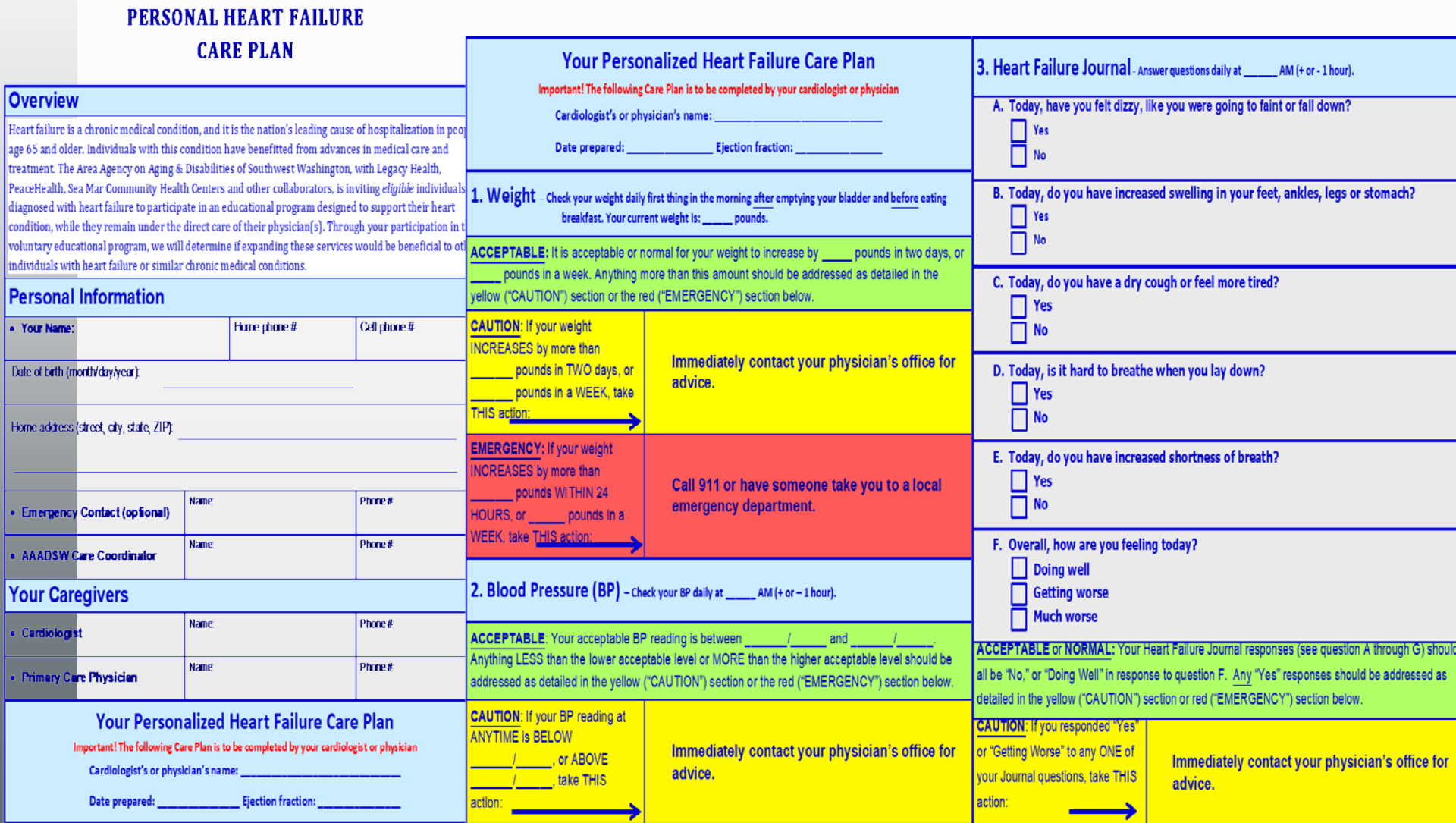
Hub forwards device data to portal

TSAP program

- Eligible AAAD clients aged 60+ diagnosed with heart failure who were already enrolled in Care Coordinator program** were invited to participate.
- Clients and care coordinators visited with cardiologist to complete a personalized Heart Failure Care Plan and received education on self-management of condition.
- Clients utilized the remote monitoring technology for a 6-month trial period.
  - Daily weight; blood pressure; medication management; health journal

***Clients in CC program were considered highest acuity based on health and dual eligibility for Medicaid/Medicare.*

Personalized Care Plans



PERSONAL HEART FAILURE CARE PLAN

Overview

Heart failure is a chronic medical condition, and it is the nation's leading cause of hospitalization in peo
age 65 and older. Individuals with this condition have benefitted from advances in medical care and
treatment. The Area Agency on Aging & Disabilities of Southwest Washington, with Legacy Health,
PeaceHealth, Sea Mar Community Health Centers and other collaborators, is inviting *eligible* individuals
diagnosed with heart failure to participate in an educational program designed to support their heart
condition, while they remain under the direct care of their physician(s). Through your participation in t
voluntary educational program, we will determine if expanding these services would be beneficial to ot
individuals with heart failure or similar chronic medical conditions.

Personal Information

• Your Name:	Home phone #	Cell phone #
Date of birth (month/day/year):		
Home address (street, city, state, ZIP):		
• Emergency Contact (optional)	Name:	Phone #:
• AAADSW Care Coordinator	Name:	Phone #:

Your Caregivers

• Cardiologist	Name:	Phone #:
• Primary Care Physician	Name:	Phone #:

Your Personalized Heart Failure Care Plan

Important! The following Care Plan is to be completed by your cardiologist or physician

Cardiologist's or physician's name: _____

Date prepared: _____ Ejection fraction: _____

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Important! The following Care Plan is to be completed by your cardiologist or physician

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1. Weight

Check your weight daily first thing in the morning after emptying your bladder and before eating breakfast. Your current weight is: _____ pounds.

ACCEPTABLE: It is acceptable or normal for your weight to increase by _____ pounds in two days, or _____ pounds in a week. Anything more than this amount should be addressed as detailed in the yellow ("CAUTION") section or the red ("EMERGENCY") section below.

CAUTION: If your weight INCREASES by more than _____ pounds in TWO days, or _____ pounds in a WEEK, take THIS action: →	Immediately contact your physician's office for advice.
EMERGENCY: If your weight INCREASES by more than _____ pounds WITHIN 24 HOURS, or _____ pounds in a WEEK, take THIS action: →	Call 911 or have someone take you to a local emergency department.

2. Blood Pressure (BP)

– Check your BP daily at _____ AM (+ or – 1 hour).

ACCEPTABLE: Your acceptable BP reading is between _____/_____ and _____/_____. Anything LESS than the lower acceptable level or MORE than the higher acceptable level should be addressed as detailed in the yellow ("CAUTION") section or the red ("EMERGENCY") section below.

CAUTION: If your BP reading at ANYTIME is BELOW _____/_____, or ABOVE _____/_____, take THIS action: →	Immediately contact your physician's office for advice.

3. Heart Failure Journal

– Answer questions daily at _____ AM (+ or - 1 hour).

A. Today, have you felt dizzy, like you were going to faint or fall down?
- ☐ Yes
- ☐ No

B. Today, do you have increased swelling in your feet, ankles, legs or stomach?
- ☐ Yes
- ☐ No

C. Today, do you have a dry cough or feel more tired?
- ☐ Yes
- ☐ No

D. Today, is it hard to breathe when you lay down?
- ☐ Yes
- ☐ No

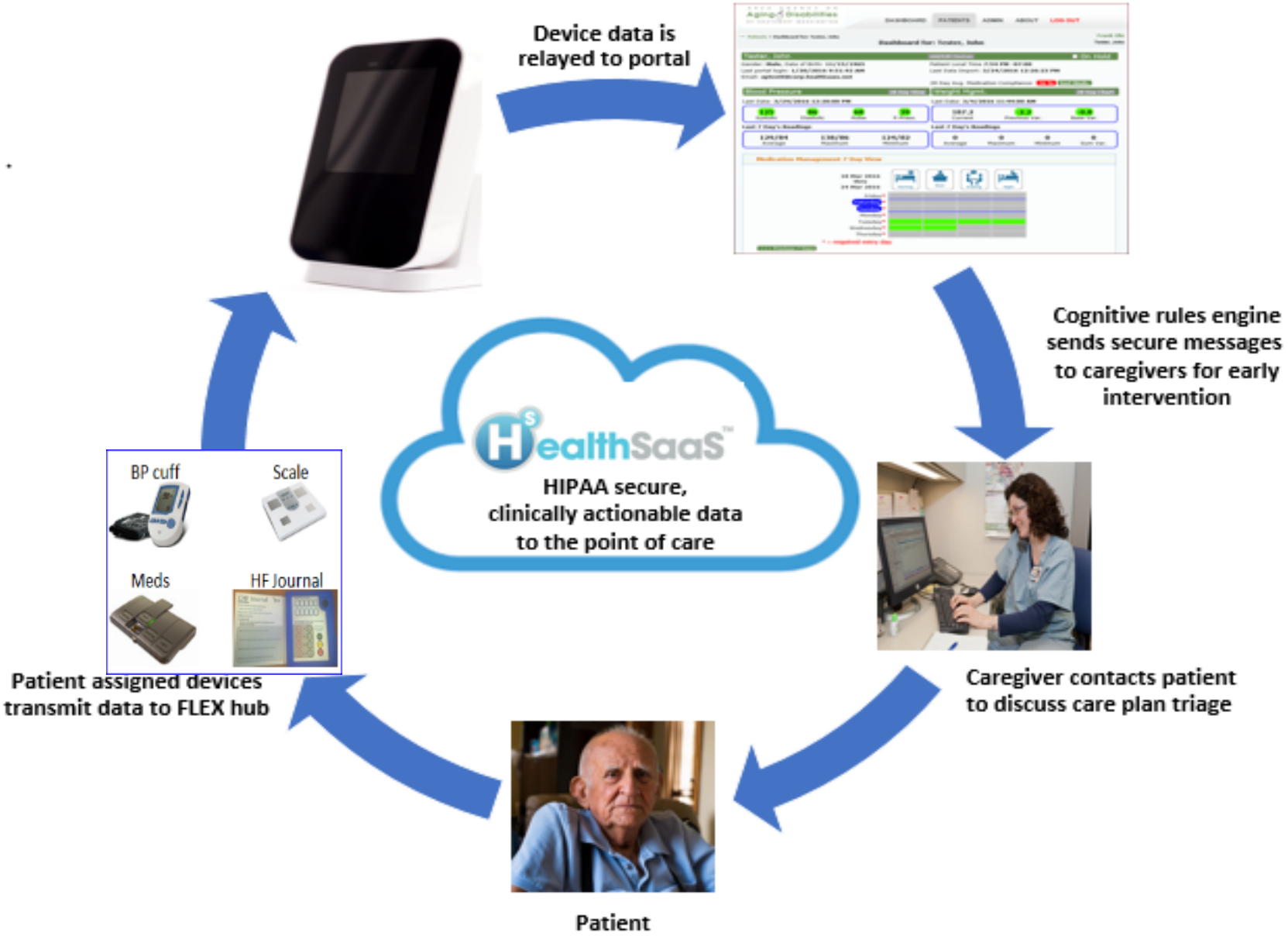
E. Today, do you have increased shortness of breath?
- ☐ Yes
- ☐ No

F. Overall, how are you feeling today?
- ☐ Doing well
- ☐ Getting worse
- ☐ Much worse

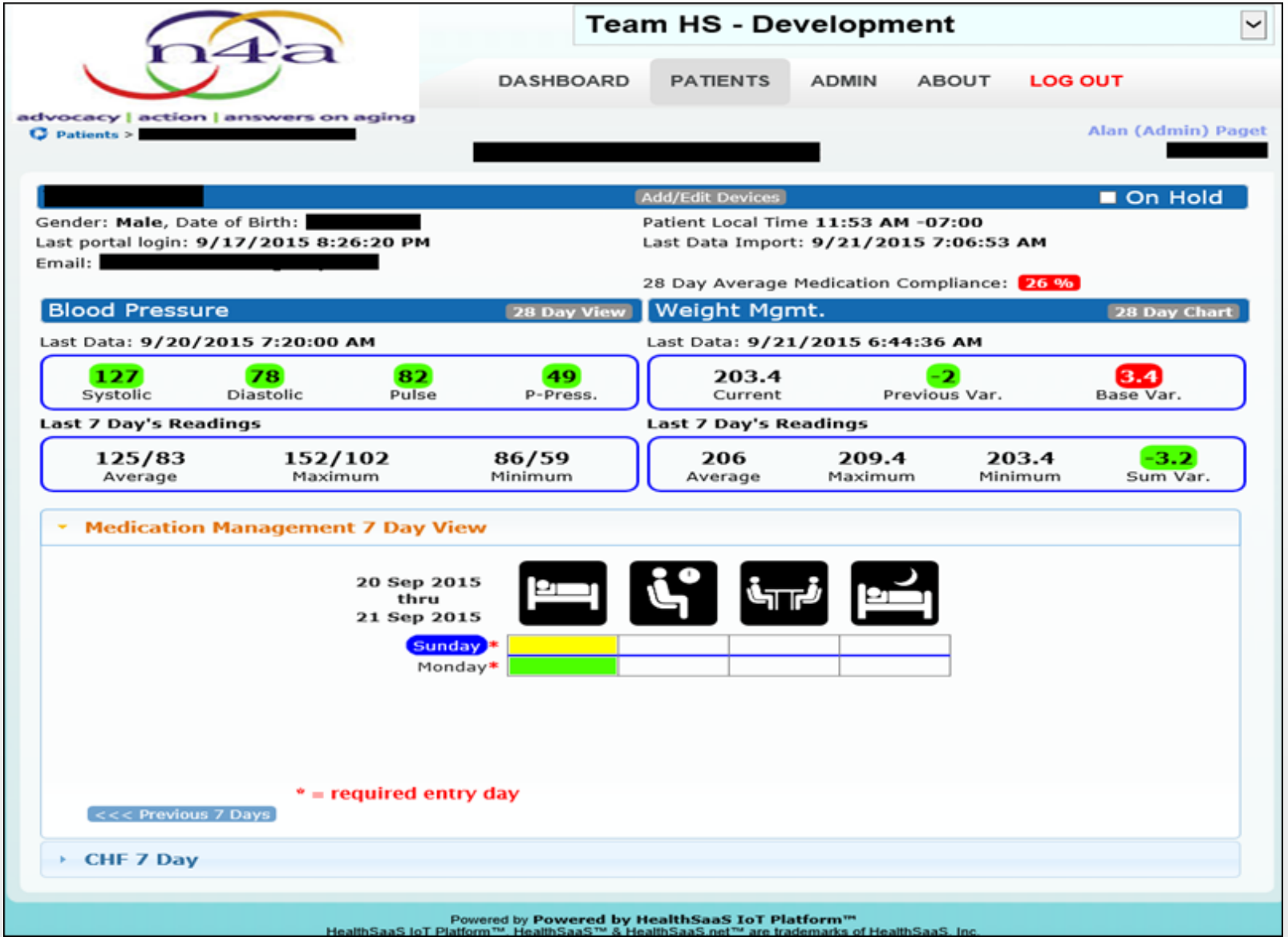
ACCEPTABLE or **NORMAL:** Your Heart Failure Journal responses (see question A through G) should all be "No," or "Doing Well" in response to question F. Any "Yes" responses should be addressed as detailed in the yellow ("CAUTION") section or red ("EMERGENCY") section below.

CAUTION: If you responded "Yes" or "Getting Worse" to any ONE of your Journal questions, take THIS action: →	Immediately contact your physician's office for advice.

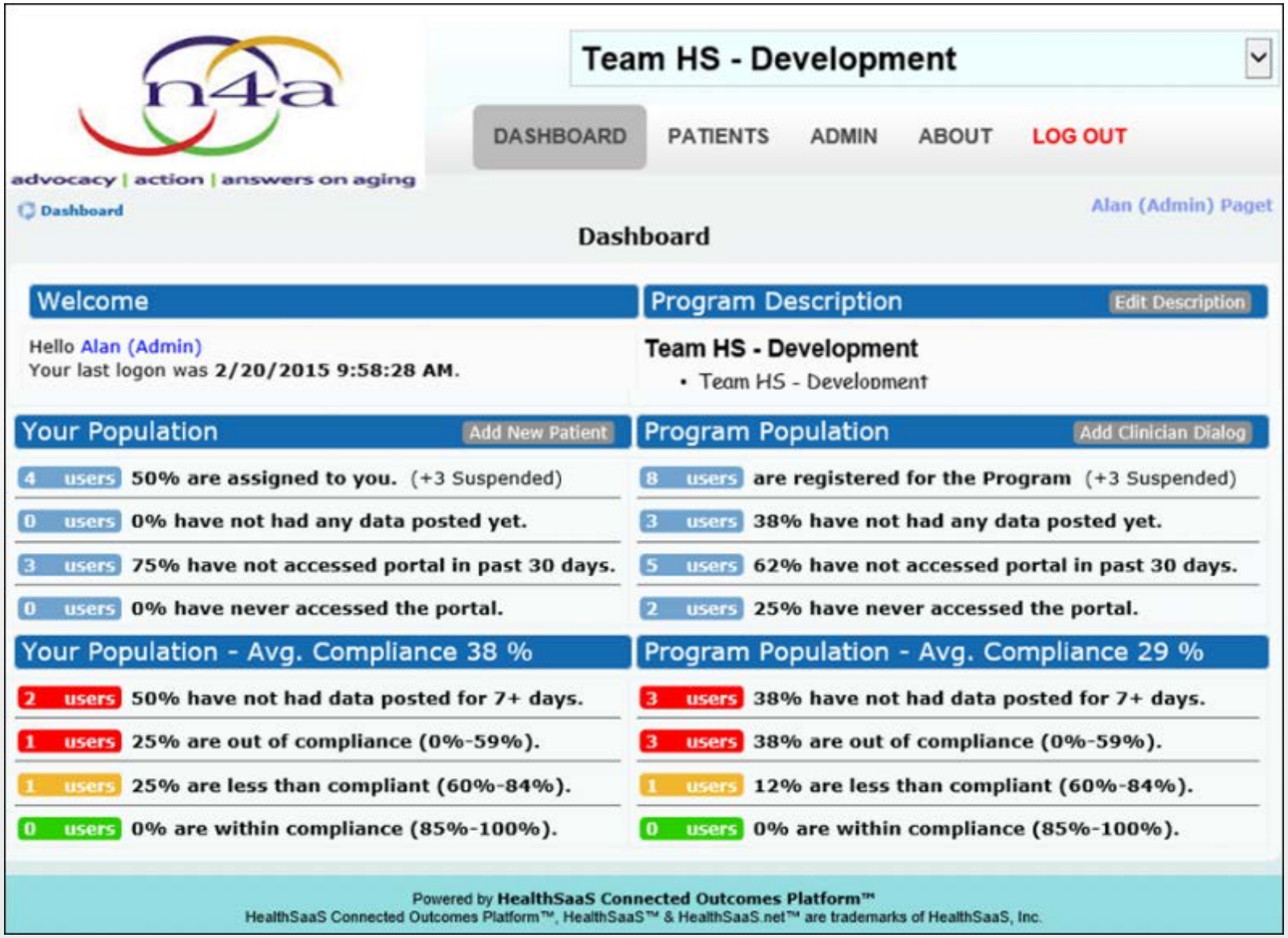
How the technology works:



Client/Patient Dashboard:



Clinician/Provider Dashboard:



Participants (overall N = 49):

- Currently, 26 have completed 6 months of the TSAP program (see table).
- Another 23 have recently finished the program.
  - Among this group, 15 are Russian speaking.

Current Client Characteristics (N = 26)	Avg or N
Age	69.4 years
Health	1.9 (range 1-5)
Gender	
Women	20
Men	6
Race	
White	22
African American	2
Pacific Islander	2
Language	
English-speaking	22
Russian-speaking	4
Education	
Grammar school	3
High school or equivalent	10
Vocational/tech school/some college	6
Bachelor's degree	3

Data Sources

Quantitative data:

- Monthly data (over 1 year timeframe; 6 months pre/post TSAP):
  - PRISM risk scores
    - Inpatient, outpatient, ER visits
    - Health services costs
  - Patient Activation Measure (PAM)
  - AAAD contact with care coordinators
- Pre/post TSAP:
  - Social Functioning-12 scale
  - Health literacy
- Daily monitoring health data for 6 months:
  - Blood pressure, weight, journals, medication, and adherence alerts

Qualitative data:

- Focus groups with AAAD staff who implemented/facilitated the program (n = 17)
- Interviews with clients who participated in the 6 month trial (n = 16).
- Care coordinator and AAAD case notes.

Care Coordinator Focus Group Themes (n = 17)

Challenges	Opportunities
• Time delays (e.g., connecting with providers; accessing electronic data).	• Educating clients/families about HF and health.
• Equipment problems (e.g., weight limit of the scale; blood pressure cuff size).	• Accountability; seeing clients change and improve in many ways.
• Establishing accurate heart failure diagnosis.	• Staff became more invested with more information and involvement.
• Time burden for some staff to manage clients.	• Clients seemed interested/excited about the program and technology.
• Client schedule/routine issues.	• The “team” aspect of the project
• Literacy issues.	
• Additional, ongoing, staff training and education needed.	
• Health acuity of clients (e.g., dialysis, high comorbidity).	

Considering next steps…

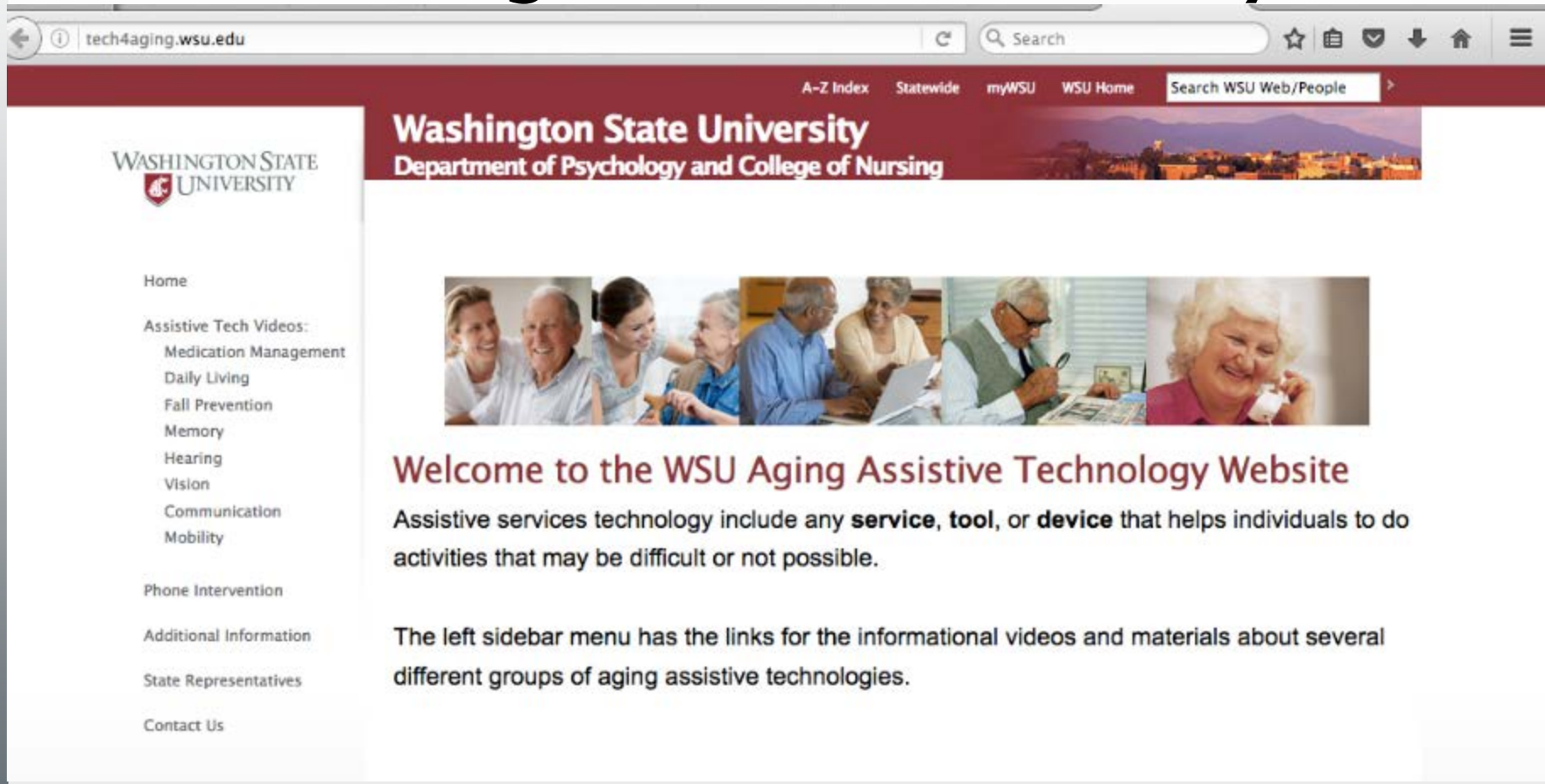
- Complete client interviews and ongoing data analysis.
- Adapt program based on lessons learned in initial implementation test phase:
  - ❑ Identify one key Care Coordinator to implement program and provide follow-up with clients?
  - ❑ Provide additional, on-going staff education and training?
  - ❑ Minimize the time lag with specialty care?
  - ❑ Expansion to capture additional chronic conditions and target younger age groups?
  - ❑ Utilize predictive analytics to improve alert system and feedback to clients?

"Uninvited Guests"

- Questions to consider regarding technology solutions:
  - How far do we push one's dignity to protect his/her safety?
  - What are the values embedded in a given technology and how do those values play out and interact with other values in practice?
  - Do reductive interpretations of older adults' needs and desires in technologies lead to disempowerment or discontinued use?
  - Whose priorities are designed for? Are there other priorities that may conflict with or challenge these priorities?

Source: Berridge, C. (2017): http://criticalgerontology.com/fulfilling-promises-gerotech-clara-berridge/

One more gerontechnology resource at Washington State University:



- Tech4aging.wsu.edu

Thank you!

- For questions or additional information:

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