A Value-Driven Framework for Evaluating Healthcare Innovations

U.S. DEPARTMENT OF VETERANS AFFAIRS
Veterans Health Administration
Office of Discovery, Education and Affiliate Networks
Office of Healthcare, Innovation, and Learning

Date Published: Fall 2021

CLICK TO ENTER

VA | U.S. Department of Veterans Affairs

Designing a Path to High Value Care Through Innovation that Matters to...

VETERANS

"Technology is moving quickly and it's hard for Veterans like me to keep up. **I love my VA care. They never stop pushing the boundaries of how it can be better for me and my fellow Veterans.**"

Michael Borges
Veteran Patient Expert,
U.S. Airforce Retired

HEALTH SYSTEM LEADERS

"**We have an opportunity to redefine the blueprint for successful healthcare innovations**. To be transformational, evaluation frameworks need to define true value as that which matters most to our Veteran patients."

Carolyn Clancy, MD
Assistant Under Secretary for Health for Discovery, Education, and Affiliate Networks

INNOVATION DECISION-MAKERS

"**To innovate the path to high value care**, we must first redefine value beyond just dollars and cents. To ensure that every dollar invested returns value to the Veterans we serve, we need to focus on measuring value across the domains of access, effectiveness, efficiency, and equity."

Ryan Vega, MD, MHSA
Chief Officer, Office of Health, Innovation, and Learning

Generating the Evidence-Based Framework Using a Mixed-Method Approach

This Value-Driven Framework for Evaluating Healthcare Innovations is the culmination of extensive research to include a literature review, expert interviews, and user-testing.

33

33 years of peer reviewed publications on healthcare innovation and value frameworks were examined.

> *"In innovation we tend to focus on shiny technology. Innovation is about the creation of value to the existing customer or bringing new customers to your business because of the value you create for them."*

Ryan Vega, MD, MSHA
Chief Officer for the Office of Healthcare, Innovation, and Learning

80+

80+ evidence based research publications reviewed to understand the current state of value frameworks in healthcare.

30+

30+ leaders internal and external to VA interviewed. Expertise included implementation science, innovation strategy, digital health, health equity, healthcare administration, and Veterans themselves.

> *"Value for me is... if I need care tomorrow, I will get quality, unbiased, and on time care. That will make me feel valued and heard."*

Michael Borges
Veteran Patient Expert,
U.S Airforce Retired

> *"Value isn't static—value is an emerging property that comes from iterating, listening to your users, and making it better."*

Joseph Francis, MD, MPH
Chief Improvement & Analytics Officer

A Value-Driven Framework for Evaluating Healthcare Innovations

To measure healthcare innovation success and value, VA created a fit-for-purpose evaluation framework that focuses on four dynamic measures of value—access, effectiveness, efficiency, and equity—and follows three fundamental principles—meaningfulness, appropriateness of scale, and time to value realization.

With this new framework, VA has the opportunity to:

- Prioritize what matters to Veterans and continue to support **excellence in value-driven Veteran healthcare**
- Design, develop and deploy a portfolio of **mission-driven and sustainable** healthcare innovations
- Realize the dynamism of innovation value, yielding more significant health outcomes over time from **individual and population levels**

Principles for Value-Driven Innovation	Value Measures (Fit-for-Purpose): Access	Effectiveness	Efficiency*	Equity
Meaningfulness	Ensure that the innovation yields positive difference across these value measures in a way that matters to Veterans and those who care for them			
Appropriateness of Scale	Identify the appropriate level of scale and market to optimize the value of an innovation across these value measures			
Time to Value Realization	Recognize that not all value measures may be achieved immediately, but rather may be realized over time (e.g., 1–2 years, 2–5 years, 5–10 years, and 10+ years)			

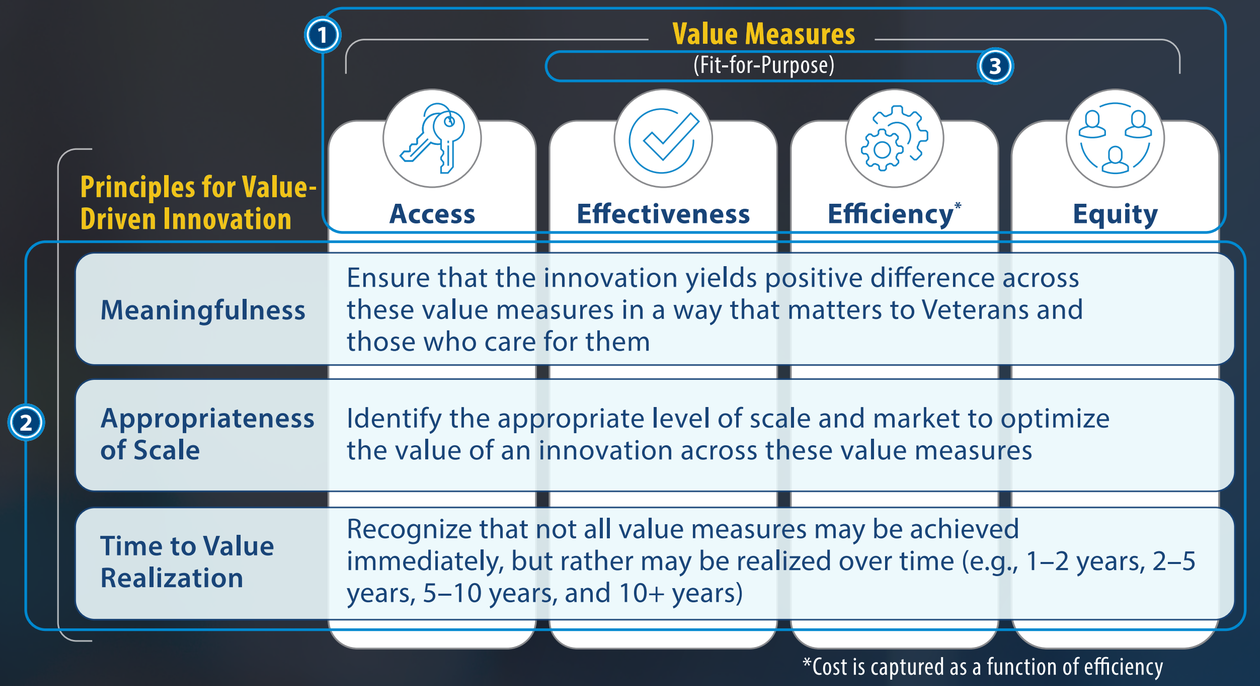
*Cost is captured as a function of efficiency

Anatomy of the Framework

This framework is comprised of three major components to enable the evaluation of healthcare innovations:

1. **Value Measures:** A healthcare innovation should be assessed by how it drives value across these four measures: Access, Effectiveness, Efficiency, and Equity. Positive outcomes across these foundational, time-agnostic measures help shape the ideal state of healthcare for Veterans.

2. **Principles for Value-Driven Innovation:** Meaningfulness, Appropriateness of Scale, and Time to Value Realization are fundamental principles that should frame the value-determination of an innovation. These principles operate across the value measures and hold equal importance. However, if an innovation does not demonstrate meaningfulness as a primary step, one should not move forward.



3. **Fit-for-Purpose:** No value measure is more important than the other. The appropriateness of each value measure is rooted in the purpose of the innovation. Each value measure should be considered in the context of providing personalized, tailored care for our Veterans.

Language Matters

Establishing a shared language is critical for building trust, fostering collaboration, and driving adoption of the framework.
Shared language should be intentional.

Value: "Value encompasses many of the other goals already embraced in health care, such as quality, safety, patient centeredness, and cost containment, and integrates them. It is also fundamental to achieving other important goals such as improving equity and expanding access at reasonable cost." [1]

Access: "The timely use of personal health services to achieve the best health outcomes." [2]

Effectiveness: "Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively)."[3]

Efficiency:* "The extent to which the inputs to the health system, in the form of expenditure and other resources, are used to best effect to secure health system outputs and/or valued health system goals." [4]

Equity: "Achieved when every person has the opportunity to attain his or her full health potential and no one is disadvantaged from achieving this potential because of social position. No value measure is more important than the other—thereby providing personalized, tailored care for our Veterans or other socially determined circumstances." [5]

**Cost is captured as a function of efficiency.*

[1] *Porter, M. E. (2010). What is value in health care. N Engl J Med, 363(26), 2477-2481*

[2] *Institute of Medicine (US) Committee on Monitoring Access to Personal Health Care Services; Millman M, editor. Access to Health Care in America. Washington (DC): National Academies Press (US); 1993. Available from: https://www.ncbi.nlm.nih.gov/books/NBK235882/ doi: 10.17226/2009*

[3] *Six domains of health care quality. AHRQ. (2015). https://www.ahrq.gov/talkingquality/measures/six-domains.html . Last reviewed November 2018. Accessed August 18, 2021*

[4] *Cylus, J., Papanicolas, I., Smith, P. C., & World Health Organization. (2016). Health system efficiency: how to make measurement matter for policy and management. World Health Organization. Regional Office for Europe*

[5] *Centers for Disease Control and Prevention. (2020, March 11). Health equity. https://www.cdc.gov/chronicdisease/healthequity/index.htm. Last reviewed March 11, 2020. Accessed August 18, 2021*

How to Deploy the Framework

The Value-Driven Framework for Evaluating Healthcare Innovations offers three solutions to decision makers:

1. **Demonstrate the balance of value being pursued across an innovation portfolio**
   - Is your innovation portfolio balanced to meet your strategic goals?
   - Do you have a clear vision of how the innovations in your portfolio will mature over time and yield new value?

2. **Support investment decisions based off a holistic evaluation of the value they promise**
   - How do your investment opportunities in healthcare innovation promise to return value across the domains of access, effectiveness, efficiency, and/or equity?
   - How are your investment opportunities in healthcare innovation meaningful to Veterans?
   - What is the optimal scale of your investment opportunities in healthcare innovation?
   - What is the potential of investment opportunities in healthcare innovation to realize additional value over time?

3. **Inform operational rigor needed to track the full range of value returned from the innovation portfolio**
   - How does your organization equip innovators with data that outlines the needs and experiences of Veterans to ensure meaningful innovation?
   - How does your organization track and measure impact across the "value measures" (access, effectiveness, efficiency, and equity) for each innovation?

**The questions above are guiding questions to help decision maker deploy this framework in their daily lives*

Meet Sebastian Wright

AGE 43 • PRONOUNS: THEY/THEM/THEIRS
PROFILE: IDENTIFIES AS GAY QUEER (LGBTQIA+ = LESBIAN, GAY, BISEXUAL, TRANSGENDER, QUEER, INTERSEX, ASEXUAL+) VETERAN

Sebastian served in the Navy during "Don't Ask, Don't Tell" and spent much of their military service hiding their gender identity. After leaving the military, Sebastian continued to be reluctant to disclose their identity with others and developed an intense disdain for themself. Sebastian's concerns about acceptance, amplified by the challenge of readjusting to civilian life, caused them to isolate and increase alcohol consumption as a coping mechanism. Sebastian's invisible wounds—including depression, fear, and internal turmoil—discouraged them from seeking medical care.

Sebastian is not alone. LGBTQIA+ Veterans have historically felt invisible and excluded from the care continuum because of their unique health care needs.

This story is inspired by a real-life example, but sensitive information has been altered to maintain confidentiality.

The Invisibility of Colorful Lives

Scars from rejecting experiences during military service and prior "Don't Ask, Don't Tell" policies, have been linked to a disproportionate risk for depression and suicide in LGBTQIA+ Veterans.[6] These factors, alongside the aggravating stress of self-expression and social isolation, create a reluctance from LGBTQIA+ Veterans to seek medical care at VA.

1M+

1 million+ Veterans who identify as LGBTQ+ are often faced with increased mental and physical health risks, and unique challenges in accessing quality health care. [6]

>20X

>20x higher risk of suicidal behavior in Transgender Veterans than for Veterans in general. [7]

1 IN 4

1 in 4 LGBT Veterans choose to avoid disclosing their sexual orientation or gender identity status to any VA provider. [8]

[6] *Lange, T. M., Hilgeman, M. M., Portz, K. J., Intoccia, V. A., & Cramer, R. J. (2020). Pride in all Who Served: Development, Feasibility, and Initial Efficacy of a Health Education Group For LGBT Veterans. Journal of trauma & dissociation : the official journal of the International Society for the Study of Dissociation (ISSD), 21(4), 484–504. https://doi.org/10.1080/15299732.2020.1770147*

[7] *Blosnich JR, Brown GR, Shipherd Phd JC, Kauth M, Piegari RI, Bossarte RM. Prevalence of gender identity disorder and suicide risk among transgender veterans utilizing veterans health administration care. Am J Public Health. 2013 Oct;103(10):e27-32. doi: 10.2105/AJPH.2013.301507. Epub 2013 Aug 15. PMID: 23947310; PMCID: PMC3780758*

[8] *Sherman, M. D., Kauth, M. R., Shipherd, J. C., & Street, R. L. (2014). Communication between VA providers and sexual and gender minority veterans: A pilot study Psychological Services, 11(2), 235–242. https://doi.org/10.1037/a0035840*

Creating a More Equitable Tomorrow, Today

The **PRIDE in all Who Served Program (PRIDE)** is a 10-week health education group for LGBTQIA+ Veterans with the aim of reducing health care disparities and enabling dialogue related to health care needs. Founded in 2016, PRIDE focuses on helping participants improve their overall wellness, increase social connections, and engage in services related to their health care needs. With over 500 Veterans impacted, PRIDE ensures Veterans like Sebastian feel seen, heard, and have the tools to become active participants in their health and wellness. Beyond Veterans, PRIDE also educates care teams on the unique needs of LGBTQIA+ Veterans so that they may better understand, engage, and serve them.

PRIDE can provide visibility, community support, and engagement opportunities for 1 million LGBTQIA+ Veterans.

PRIDE Demonstrates Principles for Value-Driven Innovation

Meaningfulness

PRIDE provides LGBTQIA+ Veterans with health education, visibility, and community support. This program is specifically tailored to the unique needs of LGBTQIA+ Veterans and engages them in a way that re-instills their trust in VA care. Ultimately, this increases LGBTQIA+ Veterans' engagement with the care and resources they need to optimize their health.

Appropriateness to Scale

PRIDE's scale approach prioritizes population needs and LGBTQIA+ Veteran vulnerability, such as incidences of suicidal thoughts and reported mental health cases, to inform and prioritize implementation at the enterprise level. Using data to identify high-risk population areas, the VA employs a targeted scale approach.

Time to Value Realization

PRIDE yields significant value in creating a more equitable and accessible health system for LGBTQIA+ Veterans by providing them the tools needed to live open, healthy lives. Over time, PRIDE will also yield significant value to VA by providing more effective and efficient care for this Veteran population through improved health outcomes, decreased barriers to care, and strengthened Veteran-provider relationships.

Value Measures
(Fit-for-Purpose)

Principles for Value-Driven Innovation	Access	Effectiveness	Efficiency*	Equity
Meaningfulness	Ensure that the innovation yields positive difference across these value measures in a way that matters to Veterans and those who care for them			
Appropriateness of Scale	Identify the appropriate level of scale and market to optimize the value of an innovation across these value measures			
Time to Value Realization	Recognize that not all value measures may be achieved immediately, but rather may be realized over time (e.g., 1–2 years, 2–5 years, 5–10 years, and 10+ years)			

*Cost is captured as a function of efficiency

Measuring the Value of PRIDE

Access

Improves access to care by providing LGBTQIA+ Veterans the patient education, engagement, and activation needed for trusted care coordination

Effectiveness

Improves effectiveness through improved health literacy, reduced likelihood of attempted suicide, reduced anxiety, reduced concern about conformity, and increased protective factors (e.g., community and identity certainty)—leading to potential improved health outcomes

Efficiency

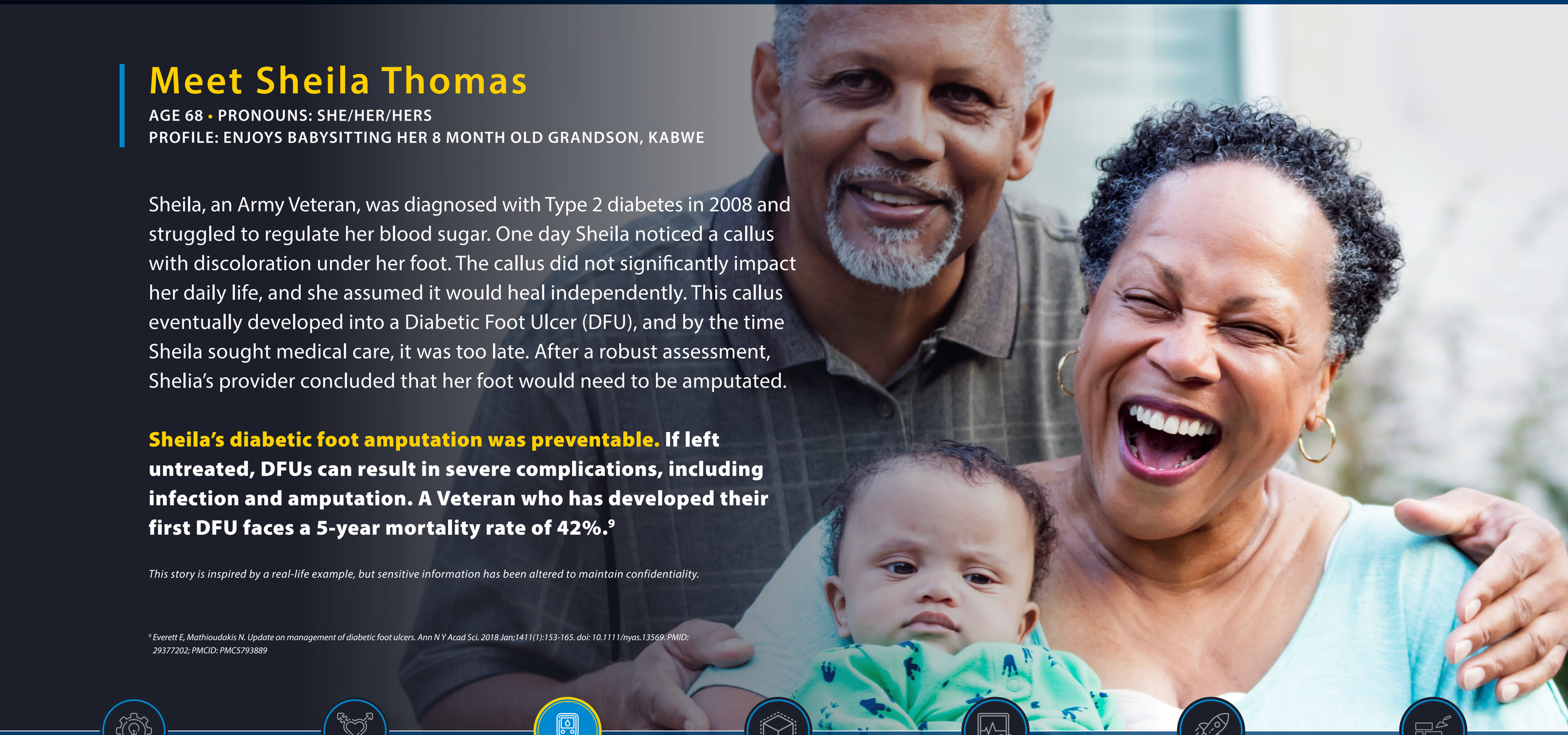
Improves efficiency through improved quality of care via provider competency training, improved social and overall wellbeing in Veterans, and reduction in costly adverse risks (e.g., attempted suicide, depression, and addiction)

Equity

Advances equitable care by creating a health system where LGBTQIA+ Veterans have equal opportunity to attain their full health potential (free of shame, stigma, and fear) and equips providers with equity-specific training to better serve the unique needs of LGBTQIA+ Veterans

Meet Sheila Thomas

AGE 68 • PRONOUNS: SHE/HER/HERS
PROFILE: ENJOYS BABYSITTING HER 8 MONTH OLD GRANDSON, KABWE



Sheila, an Army Veteran, was diagnosed with Type 2 diabetes in 2008 and struggled to regulate her blood sugar. One day Sheila noticed a callus with discoloration under her foot. The callus did not significantly impact her daily life, and she assumed it would heal independently. This callus eventually developed into a Diabetic Foot Ulcer (DFU), and by the time Sheila sought medical care, it was too late. After a robust assessment, Shelia's provider concluded that her foot would need to be amputated.

Sheila's diabetic foot amputation was preventable. If left untreated, DFUs can result in severe complications, including infection and amputation. A Veteran who has developed their first DFU faces a 5-year mortality rate of 42%.[9]

This story is inspired by a real-life example, but sensitive information has been altered to maintain confidentiality.

[9] *Everett E, Mathioudakis N. Update on management of diabetic foot ulcers. Ann N Y Acad Sci. 2018 Jan;1411(1):153-165. doi: 10.1111/nyas.13569. PMID: 29377202; PMCID: PMC5793889*

Healthier Feet, One Step at a Time

Every 20 seconds a limb is lost to diabetes, and DFUs are one of the most common and debilitating complications of this disease.[10] With the life-changing consequences related to diabetic ailments, VA recognizes the importance of preventive care for at-risk Veterans.

1 IN 4

1 in 4 Veterans have diabetes and nearly 75,000 Veterans with DFU are treated annually at VA. [11]

>80%

>80% of non-traumatic limb amputations at VA are due to DFUs. [12]

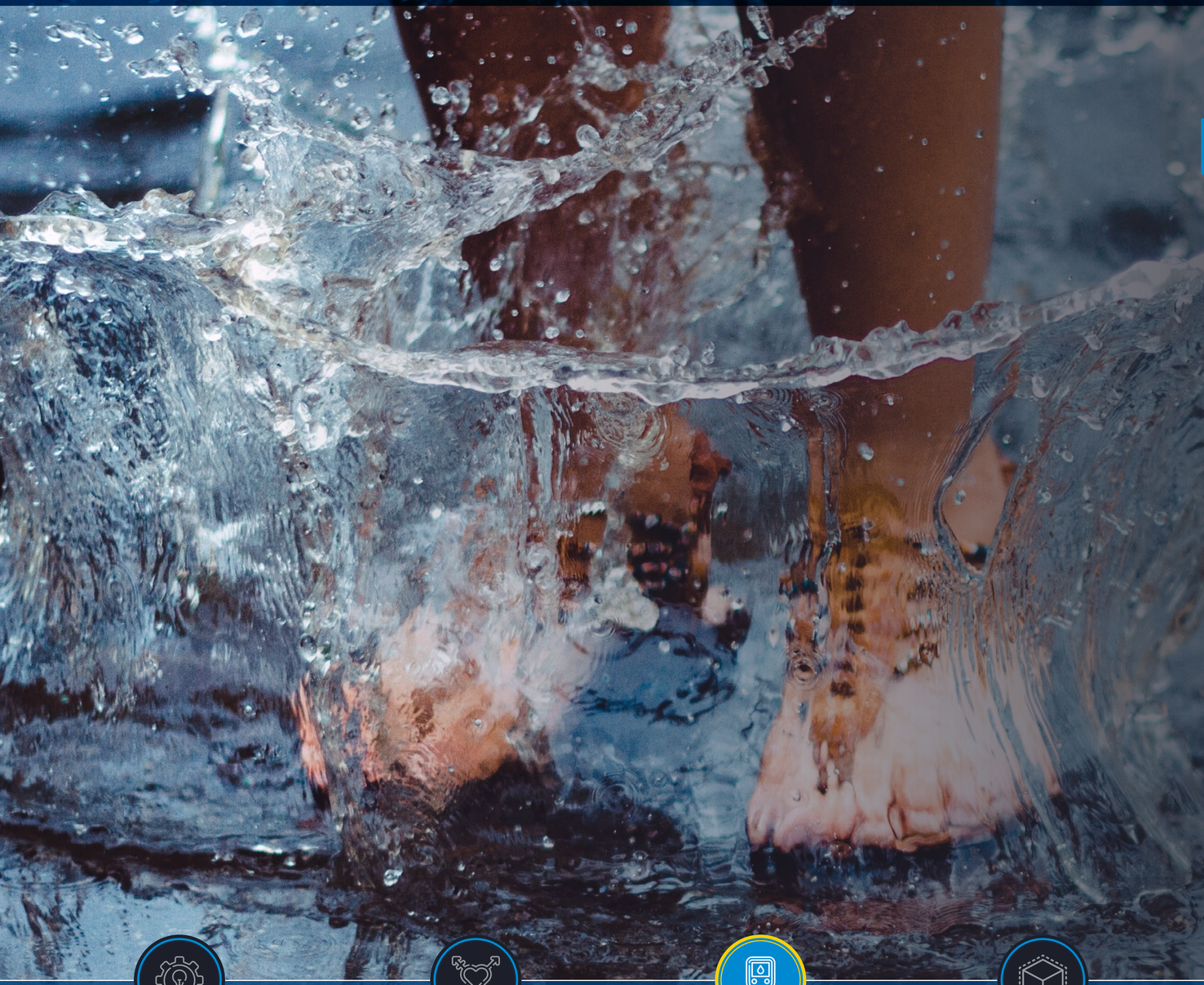
$3.2B

$3.2 Billion in VA enterprise costs related to diabetic foot complications. [12]

[10] *Lancet T. Putting feet first in diabetes. The Lancet 2005;366:1674*

[11] *U.S. Department of Veterans Affairs. Veteran Population. Veteran Population - National Center for Veterans Analysis and Statistics (va.gov).Updated April 14, 2021. Accessed August 19, 2021*

[12] *U.S. Department of Veterans Affairs. VAntage Point. How Innovation and Partnership are Ending Diabetic Limb Loss at VA. Accessed August 19, 2021*



Steps in the Right Direction

The **Remote Temperature Monitoring program** offers thermal imaging of patients' feet using noninvasive, digitally-driven SmartMATs to identify early onset of Diabetic Foot Ulcers (DFUs). By standing on the device for 20 seconds each day, Remote Temperature Monitoring collects and analyzes foot temperature scans and transmits them to the clinician's dashboard. These real-time results equip clinical teams with data to make informed decisions and take preventative action as needed. With an aim to reduce limb amputations in diabetic Veterans, Remote Temperature Monitoring is transforming the way Veterans with diabetes receive care.

This solution is instrumental in VA's effort to end debilitating diabetic limb loss and ensures Veterans like Sheila receive world-class, preventative diabetes care.

Remote Temperature Monitoring Demonstrates Principles for Value-Driven Innovation

Meaningfulness

By saving Veterans from potential amputation, Remote Temperature Monitoring helps patients with diabetes preserve functionality, conduct daily activities, and pursue an active lifestyle. Remote Temperature Monitoring maintains Veterans' quality of life, independence, and well-being while reducing the negative impacts on caregivers, who often experience increased burden and stress from caring for amputees.

Appropriateness to Scale

Initially, Veteran segmentation informed Remote Temperature Monitoring's approach to scale—with diabetes incidence, population needs, and Veteran vulnerability for diabetic limb loss (e.g., race, geographic location) being primary indicators. Today, through The Initiative to End Diabetic Limb Loss (TIEDLLV), every Veteran who receives VA care and meets the clinical criteria can receive a SmartMat for Remote Temperature Monitoring.

Time to Value Realization

Remote Temperature Monitoring yields value in providing more effective diabetics care through timely prevention and clinical action. Over time, Remote Temperature Monitoring's prevention of non-traumatic amputations and subsequent care requirements will likely result in improved cost-avoidance from hospital admissions, lower limb amputations, and restorative care needs (e.g., rehabilitation, home health aid).

Value Measures
(Fit-for-Purpose)

Principles for Value-Driven Innovation	Access	Effectiveness	Efficiency*	Equity
Meaningfulness	Ensure that the innovation yields positive difference across these value measures in a way that matters to Veterans and those who care for them			
Appropriateness of Scale	Identify the appropriate level of scale and market to optimize the value of an innovation across these value measures			
Time to Value Realization	Recognize that not all value measures may be achieved immediately, but rather may be realized over time (e.g., 1–2 years, 2–5 years, 5–10 years, and 10+ years)			

*Cost is captured as a function of efficiency

Measuring the Value of Remote Temperature Monitoring

Access

Improves access through SmartMATs' convenient, local, and expedited diagnostics (20 second detection time), ultimately improving timely and proactive care for hard-to-reach Veteran populations

Effectiveness

Improves effectiveness through real-time ulcer monitoring, equipping providers with the data to make tactical clinical decisions early on for quality care

Efficiency

Improves efficiency through cost avoidance related to lower limb amputations, hospital admissions, and recurring treatment expenditures. While these financial incentives are exciting, benefits also manifest in clinician time savings and data aggregation, leading to more comprehensive care coordination and delivery.

Equity

Improves equity of care by creating a proactive and preventative care model to help reduce diabetes care disparities related to race, poverty, and geographical location. By providing Remote Temperature Monitoring to all at-risk Veterans inside their homes, this solution offers a convenient evaluation tool to communities that face significant care barriers and constraints.

Meet Carlos Rivera

AGE 61 • PRONOUNS: HE/HIM/HIS
PROFILE: RETIRED ENGINEER AND ENJOYS REFURBISHING FURNITURE

Carlos is an Air Force Veteran who, over time, developed a rare form of hearing loss. Carlos' heart condition and previous combat-related surgeries made him certain he did not want another invasive procedure to treat the condition. Unfortunately, surgery was seemingly the only treatment available. Carlos continued to struggle with impaired hearing, which strained his quality of life and personal relationships.

Carlos' care should not be limited. Carlos, like many patients, craved a personalized solution that respected his care preferences and was responsive to his health needs. Most of all, he wanted to feel involved in the care process with his providers.

This story is inspired by a real-life example, but sensitive information has been altered to maintain confidentiality.

One Size Does NOT Fit All

Compared to other countries with high gross national income, the U.S. has the lowest life expectancy (78.8 years old), despite spending far more on health care than any other country.[13] This imbalance between care spending and care success articulates the urgent need for U.S. health care to evolve past its "one-size-fits-all" model. The alternative that should be adopted is a patient-matched, personalized approach to care services and products, integrating the individuality of patients to improve trust and collaboration.

92.5%

92.5% of individuals want to play either an active or a collaborative role in decision making with their physician. [14]

95%

95% of the U.S. health consumers, aged 30 years and older, expect personalized medicine to have a positive benefit. [15]

$15M+

$15.24 Million estimated yearly cost avoidance with 3D printing applications in the operating room. [16]

[13] *Centers for Disease Control and Prevention. (2021, October 20). FastStats - Life Expectancy. https://www.cdc.gov/nchs/fastats/life-expectancy.htm. Last reviewed October 20, 2021. Accessed October 15, 2021.*

[14] *Davison, B. J., Gleave, M. E., Goldenberg, S. L., Degner, L. F., Hoffart, D., & Berkowitz, J. (2002). Assessing information and decision preferences of men with prostate cancer and their partners. Cancer nursing, 25(1), 42–49. https://doi.org/10.1097/00002820-200202000-00009*

[15] *S. Garfeld, M.P. Douglas, K.V. MacDonald, D.A. Marshall, K.A. Phillips Consumer familiarity, perspectives and expected value of personalized medicine with a focus on applications in oncology; Personalized Medicine, 12 (1) (2015), pp. 13-22, 10.2217/pme.14.74*

[16] *Ballard DH, Mills P, Duszak R Jr, Weisman JA, Rybicki FJ, Woodard PK. Medical 3D Printing Cost-Savings in Orthopedic and Maxillofacial Surgery: Cost Analysis of Operating Room Time Saved with 3D Printed Anatomic Models and Surgical Guides. Acad Radiol. 2020;27(8):1103-1113*

Personalizing the Future of Care

3D Printing reimagines personalized care delivery and provides patient-specific solutions, even when no commercial products exist or are available. This capability makes it easy for Carlos to co-create a non-surgical solution with his care team and receive a personalized, patient-matched 3D Printed ear stent for his condition.

VA's investment in 3D Printing began in 2017 through the establishment of the VA 3D Printing Network. With 3D Printing capabilities at over 65 VA Medical Centers (VAMC), VA has established new health care possibilities across five clinical service lines: bio-printing, orthotics & prosthetics, assistive technology, dental, and pre-surgical planning.

3D Printing Demonstrates Principles for Value-Driven Innovation

Meaningfulness

3D Printing enables care teams to account for the whole Veteran and create 1:1 customized solutions that respect the Veteran's unique anatomy, preferences, values, and treatment goals. This technology is a conduit for translating the Veteran-voice into clinical outcomes in ways that matter most to the Veteran.

Appropriateness to Scale

3D Printing's approach to scale focuses on targeted investments in clinical areas that are (1) most ripe for custom care and (2) have high-cost expenditure for the enterprise (e.g. pre-surgical planning and dental). 3D Printing's potential avenues for enterprise-wide benefits—such as cost-avoidance, licensing, and commercialization potential—will enable self-sustainment and enterprise-wide implementation.

Time to Value Realization

3D Printing improves access to timely care solutions, provides more effective care through personalization and improves care team efficiency. There's significant cost avoidance from reduced community care outsourcing, allowing VA to optimize existing infrastructure and human capital. Over time, 3D Printing will drive the equitable distribution and availability of health care solutions (e.g., devices, bioprinted organs).

Principles for Value-Driven Innovation	Value Measures (Fit-for-Purpose): Access	Effectiveness	Efficiency*	Equity
Meaningfulness	Ensure that the innovation yields positive difference across these value measures in a way that matters to Veterans and those who care for them			
Appropriateness of Scale	Identify the appropriate level of scale and market to optimize the value of an innovation across these value measures			
Time to Value Realization	Recognize that not all value measures may be achieved immediately, but rather may be realized over time (e.g., 1–2 years, 2–5 years, 5–10 years, and 10+ years)			

*Cost is captured as a function of efficiency

Measuring the Value of 3D Printing

Access

Improves access to custom health care solutions by providing patient-matched products that do not exist commercially or have an extended lead time for production

Effectiveness

Improves effectiveness of care by delivering targeted solutions that match the individual Veteran's anatomy, needs, and preferences

Efficiency

Improves efficiency through reduced production throughput time, limited recurring maintenance, and improved product efficacy; efficiency gains may also be captured through providers' time savings in appointment lengths and pre-surgical planning

Equity

Improves equity by increasing the availability and distribution of healthcare solutions that were previously unavailable or difficult to obtain

Meet Nicole Whitney

AGE 55 • PRONOUNS: SHE/HER/HERS

PROFILE: PROFESSIONAL BAKER, KNOWN FOR HER SIGNATURE PECAN CINNAMON PIE

Nicole is a retired Marine Corps Veteran who was working her second shift at the bakery when she suddenly experienced chest tightness. Nicole was rushed to the nearest emergency room, where it was confirmed, she had a heart attack. As follow up care, Nicole's providers recommended she begin a cardiac rehabilitation (CR) program. While she tried her best to attend the recommended 36 visits, Nicole couldn't afford to miss more shifts at work nor drive an hour to her appointments. After completing three visits, Nicole stopped attending her CR. Two years later, Nicole returned to the emergency room with signs of a second heart attack.

Nicole shouldn't have to choose between income and lifesaving care. Veterans are more likely to have heart disease at a younger age than non-Veterans.[17]

This story is a realistic representation of a common experience for heart-attack patients, and informed by research for CR.

[17] *Hinojosa, Ramon. "Veterans' likelihood of reporting cardiovascular disease." The Journal of the American Board of Family Medicine 32.1 (2019): 50-57*

At the Heart of the Problem

Heart diseases are the leading cause of preventable death globally, and are the leading cause of hospitalization in the VA health care system.[18] Completing as many CR program sessions as possible has been shown to reduce the risk of another heart attack or death.

80%

80% of cardiovascular disease, including heart disease and stroke, are preventable. [20]

<1 in 5

<1 in 5 Veterans with heart diseases are able to access life-saving CR programs due to physical distance, cost of the program, or other reasons. [21]

47%

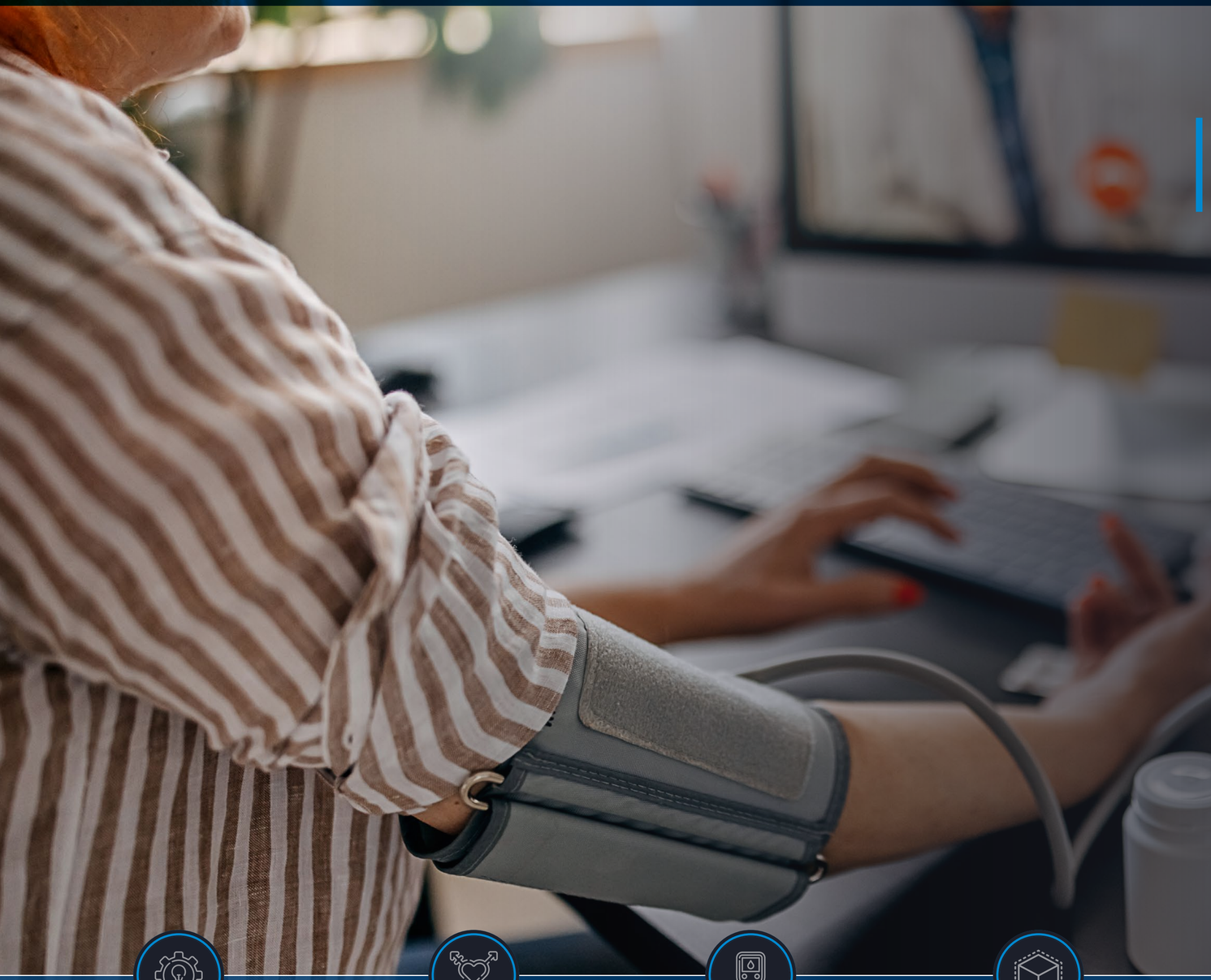
47% lower risk of death and a 31% lower risk of heart attack when an individual attends 36 CR sessions than those who attend only 1 session. [19]

[18] *U.S. Department of Veterans Affairs. Office of Research & Development, https://www.research.va.gov/topics/cardio.cfm. Page last reviewed: April 22, 2020. Accessed August 18, 2021*

[19] *Centers for Disease Control and Prevention/Million Hearts. Division for Heart Disease and Stroke Prevention. https://millionhearts.hhs.gov/data-reports/factsheets/cardiac.html. Page last reviewed: April 22, 2020. Accessed August 18, 2021*

[20] *Centers for Disease Control and Prevention. Preventing 1 Million Heart attacks and strokes https://www.cdc.gov/vitalsigns/million-hearts/index.html. Accessed August 18, 2021*

[21] *Harzand A, Witbrodt B, Davis-Watts ML, Alrohaibani A, Goese D, Wenger NK, Shah AJ, Zafari AM. Feasibility of a Smartphone-enabled Cardiac Rehabilitation Program in Male Veterans With Previous Clinical Evidence of Coronary Heart Disease. Am J Cardiol. 2018 Nov 1;122(9):1471-1476. doi: 10.1016/j.amjcard.2018.07.028. Epub 2018 Aug 4. PMID: 30217377; PMCID: PMC6196098*



Home Is Where the Heart Is

The **Smart Health Education and Rehab Technology (SmartHEART) Program** uses smartphone technologies and telehealth capabilities to deliver CR to Veterans. This innovation equips Veterans with activity trackers that monitor vitals, exercise, and other wellness key performance indicators. Over 12 weeks, providers use telehealth video sessions to deliver health education content, provide mental and physical counseling, and track progress benchmarks with Veterans. With this solution, Nicole wouldn't have had to choose between working to generate income and receiving her critical rehabilitation care. Virtual CR allows Veterans the flexibility to receive care in the setting of their choice, ultimately enabling and sustaining positive lifestyle changes.

SmartHEART Demonstrates Principles for Value-Driven Innovation

Meaningfulness

SmartHEART targets the primary killer of Veterans—cardiovascular disease.[21] This solution provides cardiac care designed around the Veteran through new care models and digital innovations. SmartHEART provides an alternative to both in-person CR, which may be too costly (e.g., time costs, costs of commuting), and telephone appointments, which often limit Veteran engagement and sustained lifestyle change post-rehabilitation.

Appropriateness to Scale

SmartHEART is currently available at the Atlanta VAMC with the goal of scaling to additional sites in fiscal year 2022. SmartHEART's scale strategy targets VAMCs with established CR programs and capacity (e.g., technology onboarding, clinician bandwidth) to effectively deploy a new service line.

Time to Value Realization

Today, SmartHEART yields value by increasing access to specialty care and reducing the digital divide, especially for rural Veterans. The program provides more effective care through tailored, remote care that improves recovery from cardiac arrest and can prevent heart disease from worsening. Over time, SmartHEART will yield value across the care ecosystem by enhancing patient trust, limiting future illness or readmission, and reducing emergency room visits.

Principles for Value-Driven Innovation	Value Measures (Fit-for-Purpose): Access	Effectiveness	Efficiency*	Equity
Meaningfulness	Ensure that the innovation yields positive difference across these value measures in a way that matters to Veterans and those who care for them			
Appropriateness of Scale	Identify the appropriate level of scale and market to optimize the value of an innovation across these value measures			
Time to Value Realization	Recognize that not all value measures may be achieved immediately, but rather may be realized over time (e.g., 1–2 years, 2–5 years, 5–10 years, and 10+ years)			

*Cost is captured as a function of efficiency

Measuring the Value of SmartHEART

Access

Improves access to specialty care, particularly for Veterans in rural areas who live long distances from their VAMCs and Veterans who have difficulty taking time away from work and other personal responsibilities to prioritize lifestyle change

Effectiveness

Improves effectiveness of care by increasing patient knowledge and encouraging sustainable recovery, likely reducing the likelihood of future illness or death from heart disease; increased patient activation and satisfaction can improve the long-term adoption of a healthier lifestyle for cardiac health

Efficiency

Improves efficiency through better quality of care, cost avoidance, and reduced facility congestion, resulting in increased numbers of patient encounters without sacrificing patient engagement. Reductions in hospital readmissions and mortality are also likely to be a catalyst for patient trust and confidence, inspiring Veterans to seek care at the VA rather than in the community.

Equity

Improves equity by helping reduce disparities in cardiac care delivery, especially towards rural, non-Hispanic, Black Veterans who traditionally exhibit a higher likelihood of cardiovascular events than their White Veteran counterparts[22]

[22] Brown EA, Ward RC, Weeda E, Taber DJ, Axon RN, Gebregziabher M. Racial-Geographic Disparity in Lipid Management in Veterans with Type 2 Diabetes: A 10-Year Retrospective Cohort Study. Health Equity. 2019;3(1):472-479. Published 2019 Sep 23. doi:10.1089/heq.2019.0071

Why It's Time for a New Evaluation Framework in Healthcare Innovation

Healthcare innovation is evolving rapidly, driven by technology advancements and the need for advanced care solutions. **A fit-for-purpose evaluation framework for healthcare innovation is more important now than ever before.**

A new value framework is needed because existing frameworks:

- Are limited by their heavy focus on the value of reducing costs rather than the value of improving Veteran lives
- Do not account for the maturation of an innovation over time and how an innovation may scale value
- Typically focus on either individual-level or population-level benefits, not both

VA is uniquely positioned in the United States to drive system-level healthcare innovation, implement learning healthcare system principles, and deliver leading innovations in health to Veterans. VA created the following evaluation framework to determine the true value received by Veterans from innovations and investments.

High Value Innovation Starts With You!

VA invites you to join us in adopting this new approach for evaluating healthcare innovations. To successfully bring the promise of today's healthcare innovation to fruition, we must collectively embrace this more holistic approach to measuring value.

The VHA Office of Healthcare, Innovation, and Learning (OHIL) is committed to deploying this framework across the Veterans Health Administration Innovation Ecosystem (VHA IE) innovation portfolio. We will report use cases and metrics cascading from these evaluations as they are available. You can follow VHA IE and the Digital Medicine Society for updates as these use cases and metrics become available.

As you deploy this framework we welcome your feedback, use cases, and proposed metrics:

- Share the story with us of how you have used this new framework and what impact it has had for you and your team (and your innovation[s]) **here**
- Share your experiences and feedback with the new framework **here**

Foundation for the Future Starts with Collaboration

The VHA Office of Healthcare, Innovation, and Learning (OHIL) partnered with the Digital Medicine Society (DiMe) and Booz Allen Hamilton Inc., leveraging best in class collaboration to advance this novel Value-Driven Framework for Evaluating Healthcare Innovations.

DiMe DIGITAL MEDICINE SOCIETY

Booz | Allen | Hamilton®

OHIL would like to acknowledge and thank the following subject matter experts, who provided invaluable insight to further the Value-Driven Framework for Evaluating Healthcare Innovations:

Veteran Patient Expert
- Michael Borges, U.S. Airforce Retired

Mayo Clinic, Mayo Hypertrophic Cardiomyopathy Clinic
- Steve Ommen, MD

U.S. Department of Health & Human Services: Biomedical Advanced Research and Development Authority, Division of Research, Innovation, and Ventures (HHS: BARDA DRIVe)
- Sandeep Patel, PhD

Veterans Health Administration (VHA)
- Kameron Matthews, MD, JD, FAAFP, Assistant Under Secretary for Health for Clinical Services
- Joseph Francis, MD, MPH, Chief Improvement & Analytics Officer

Veterans Experience Office
- John Boerstler, MPA

VHA Office of Community Care
- Elizabeth Brill, MD, MBA, FACOG
- Mark Upton, MD
- Julianne Flynn, MD
- Clinton Greenstone, MD
- Jennifer Adams, JD

VHA Office of Connected Care
- Neil Evans, MD
- Kathleen Frisbee, MPH, PhD

VHA Office of Health Equity
- Ernest Moy, MD, MPH

VHA Office of Health Transformation
- Maura Catano, MBA
- Joseph Williams, MBA
- Kyaani Robinson

VHA Innovation Ecosystem
- Arash Harzand, MD, MBA
- Cole Zanetti, DO, MPH
- Kristopher "Kit" Teague
- Beth Ripley, MD, PhD
- Brian Stevenson
- Brynn Cole
- Kalyn Essex, MPA

VHA Office of Research & Development
- Rachel Ramoni, D.M.D., Sc.D

VHA Office of Research & Development: Quality Enhancement Research Initiative
- Amy M. Kilbourne, PhD, MPH
- Melissa Braganza, MPH

VHA Office of Rural Health
- Byron Bair, MD
- Sergio Romero, PhD

VHA Office of Quality Safety & Value
- Kristi Groves, RN, BSN, MBA-HCM, CPHQ
- Sue Roberts, DO, MPH, MBA, FACP, FACHE
- Suzie Berregaard, JD