REIMAGINING DELIVERY OF MIDLIFE WOMENS HEALTHCARE

by
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Abstract

Between competing time demands, a healthcare system that is difficult to navigate, and limited information directed to their demographic, it is often difficult for perimenopausal women to access quality healthcare. The result is insufficient preventative care and unsatisfactory health outcomes for women in their post-reproductive years.

The Johns Hopkins Women's Wellness and Healthy Aging Program is a new model for delivering midlife women's healthcare that offers streamlined scheduling, interdisciplinary coordination and communication, a patient navigator to help establish patient's relationships with providers in multiple specialties, and a personalized patient roadmap for healthy aging.

The rise in mobile communications over the last decade has revolutionized the way we access information. Social media has become an important platform for reaching patients, particularly underserved populations (Welch et al. 2016). Attention spans are shorter, making brief explainer videos an effective way to educate a patient population (Krämer and Böhrs 2016).

The research question this project addresses is whether brief explainer videos and illustrations on social media are effective at educating patients about this new model of integrated care. Patient stakeholder feedback was solicited at the beginning of the project to determine the most burdensome aspects of accessing quality healthcare and the health topics of most concern to middle-aged women. Subsequent rounds of stakeholder feedback were integral to the iterative process of creating the visuals and determining their efficacy. Two animations and a suite of 20 illustrations were created using the Adobe Creative Suite addressing health concerns of the perimenopausal population such as healthy aging, reducing risk of cardiovascular disease and cancer, maintaining mental health and cognitive function, and treatment of menopausal symptoms.

Patient stakeholder feedback determined that short explainer videos and illustrations on social media can be an effective tool to educate patients. Educated and engaged patients often have better health outcomes (Paterick et al. 2017). This new model of healthcare delivery and mode of educating patients have the potential to improve healthcare outcomes and decrease healthcare costs for women during their post-reproductive years.

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Introduction

Background

Women make up more than 50% of the over 300 million people living in the United States. Their life expectancy averages into the mid-80's, and they spend 1/3 of those years post-menopause (CDC, Jan. 2020). Women view menopause as a period of transition – a time when bodies, relationships, and perspectives change and shift. This transition can elicit mixed emotions (Woods and Mitchell 2016); silence and stigma surrounding menopause often contribute to women not seeking treatment for basic symptoms such as hot flashes and mood changes. Younger women with menopausal symptoms due to comorbidities such as breast cancer can face an even greater challenge accessing information and care.

The Johns Hopkins Women's Wellness and Healthy Aging Program (JHWWHAP) is a new initiative to provide care that is patient-centered, collaborative and efficient. Depending on their individual needs, patients can be seen continuously, annually, or for a one-time consult. As the current pandemic demands a foray into the uncharted territory of telehealth and remote care, Johns Hopkins Medicine is at the forefront of developing this new clinical pathway of care. Reframing the aging process as a change to be welcomed, even celebrated, can encourage women to seek the care they need.

Existing Models and Resources

Existing models for delivering healthcare to middle-aged women are either fragmented or non-existent. Much of women's healthcare focuses on the child-bearing years, but as women approach the menopausal transition, information and treatment for menopausal symptoms and other aging concerns are either scant or nonexistent.

A systemic lack of coordination between providers and misalignment of incentives has created an increase in costs and decrease in care. This inefficient model no longer makes sense. Hospitals face quality and budgetary pressure, and the patient population does not have time for multiple visits with various doctors (Kepros and Opreanu 2009) In the information age, patients expect easy access to information that empowers them to actively participate in their care. A 2007 survey showed that physicians were the most common source of menopause information (Singh et al. 2007) Separate research found that over a longitudinal 5-year study of women in midlife, 42% of women changed health providers because they were dissatisfied with their care (Kennedy, Taylor, and Lee 2005). This indicates a general disconnect between

the information and care that menopausal women are seeking from the provider, and their satisfaction with that care. This is unsurprising considering a 2017 study found that 20% of residents in family medicine, internal medicine, or obstetrics and gynecology reported not receiving any menopause lectures during their training, and only 6.8% reported feeling adequately prepared to treat women experiencing menopausal symptoms (Kling et al. 2019).

Concerns Facing Women in Midlife

Changes in hormones, combined with general aging, and lifestyle changes, means that women face many unique health concerns during midlife; and, it has becoming increasingly apparent that health in midlife is an important determinant of a healthy life in the following decades (Krämer and Böhrs 2016).

Cardiovascular disease, the leading cause of morbidity and mortality in women, along with cancer risk reduction, weight management, cognitive health, joint health, gynecological health, bone health, psychosocial needs and overall wellness are just a few examples of concerns that women face as they enter menopause. Many health concerns that are unique to middle aged women can be treated, yet many women don't seek treatment due to shame, embarrassment, lack of information, dissatisfaction with prior care, frustration with navigating the healthcare system, or lack of time.

Genitourinary syndrome of menopause is just one example of a progressive and chromic condition involving a collection of symptoms that plague many women as a result of decreased sex hormones. Genitourinary syndrome does not resolve without treatment and can adversely affect quality of life; yet, many women do not seek treatment, and of those who do, many are unhappy with their care (Kagan, Kellogg-Spadt, and Parish 2019).

Statement of Novelty

The novel JHWWHAP is addressing these concerns with a multi-pronged approach. One of the first barriers to accessing care is a culture of embarrassment, shame, and stigma surrounding menopause. The visuals created for the program are reframing menopause as a life event to be welcomed, not dreaded. A community of support prevents women from feeling isolated and alone during the menopausal transition. Another barrier to accessing care is a lack of time and difficulty navigating the healthcare system. The JHWWHAP is addressing this problem in several ways. A patient navigator serves as a single point person to help patient make appointments and establish relationships with providers.

Streamlined scheduling and pre-consultation testing mean a quicker and more efficient appointments; and, coordination and communications between providers means a comprehensive individual patient roadmap for their unique healthcare needs. Patients can utilize the JHWWHAP for a yearly check-up, onging care, or as a one-time consultation to develop a patient plan to bring back to their local physician.

The visual assets created for the JHWWHAP, including illustrations, storyboards, and 2D animations, were developed with patient stakeholder feedback at various stages in their development. As the initial script was being written and assets were being developed, a panel of 8 patients stakeholders in our target demographic provided feedback on issues that concern them as they age, aspects of accessing healthcare that they find burdensome, and formats through which they prefer to learn health related information. In addition to the first panel of stakeholder feedback, a short survey conducted through Survey Monkey helped shape the content of the animation and social media visuals. The survey collected responses from 130 individuals who answered 4 questions about their top concerns related to aging, their frustrations with the healthcare system, how they prefer to learn about health-related information, and what changes would help them more easily access better care.

After 5 illustrations were developed and the first animation was finished, second discussion with patient stakeholders was held to gain feedback on the efficacy of the visuals. Four patient stakeholders were shown the animation and illustrations for social media and were asked for their reactions and input. Further revisions were made to both the animation and illustrations incorporating the patient feedback. In addition to the revisions, more social media illustrations and a second animation were produced incorporating new content based on the patient feedback and reactions to the first animation.

Audience

The primary audience for this project is menopausal and perimenopausal women. While this project doesn't target women of a specific racial or socioeconomic demographic, because the images and videos will be online, they will be accessible primarily to women who have internet access through a mobile device or a computer, either at home or in a setting such as a library. The primary patient audience includes women who are experiencing the menopausal transition as a natural part of the aging process, and women who are experiencing menopausal symptoms as a result of medical treatment for comorbidities such as breast or gynecologic cancers. Johns Hopkins serves patients from a variety of backgrounds, including patients in the local community, as well as patients who travel nationally or even internationally

for care. For this reason the visuals created for this project are designed to be appealing to women from varied backgrounds.

The secondary audience for this project is physicians who may want to refer their patients to the JHWWAHP. Many primary care managers are not trained specifically in the treatment of menopause and menopausal symptoms. For women who experience severe symptoms of menopause that interfere with daily life, their primary care physician may refer them to the specialists at the JHWWHAP.

Objectives

The objective of this project is to develop a multimedia toolkit that will educate patients and referring physicians about the Johns Hopkins Women's Wellness and Healthy Aging Program. Through the use of explainer videos and social media images, patients and referring physicians will learn about this new model of care, why it is unique, and what it can offer to patients.

The use of short explainer videos as a learning tool and means of disseminating information has been steadily rising with the use of social media. A 2016 German study showed that people who watch videos daily increased from 9% in 2011 to 26% in 2016 (Krämer and Böhrs 2016). Because explainer videos convey complex facts to a target audience in a very short amount of time, they are an ideal way to communicate this new clinical pathway to a patient audience.

Social media, as a means of disseminating public health information and health promotion has been increasing because it can remove geographic and physical access barriers. Social media interventions have been shown to be effective in reaching disadvantaged populations (elderly, low socioeconomic status, rural communities) and may be an effective way to promote health equality (Welch et al. 2016).

For these reasons, the decision to focus on creating two short animations and a suite of 2-dimensional illustrations formatted for social media became the priority in this project. This model of disseminating information enables the JHWWHAP to easily reach a broad audience of their target patient population.

Materials and Methods

Work flow for this project was as follows:

1. Research
2. First round of live stakeholder feedback
3. Written survey
4. Script writing
5. Storyboarding & animatic
6. Visual asset creation
7. Final animations
8. Social media illustrations
9. Second round of live stakeholder feedback

Research

Prior to the commencement of making visual assets, research was conducted into the following three areas:

1. Existing models for delivering midlife women's healthcare information
2) The most prevalent concerns women have as they approach midlife
3) What are the most effective means for reaching and educating a large public audience.

Research into existing models for delivering midlife women's healthcare was conducted through online search engines such as Google and Duck Duck Go; by searching on healthcare websites such as the Mayo Clinic and the Cleveland Clinic; and, by reading studies and papers about current models for healthcare. Research was conducted into women's most prevalent concerns, and the most effective means for reaching and educating a public audience, by holding two rounds of patient stakeholder feedback and conducting an online survey.

Existing models for delivering midlife women's healthcare were found to be lacking in two areas: number of resources, and ease of access to information and care. Online searches revealed many resources for women's healthcare focusing on the reproductive years, but far less information, and very few

programs focusing exclusively on women's healthcare during midlife and in the post-reproductive years. The Cleveland Clinic, for example, has 13 subspecialty categories under the umbrella of Women's Health, but not one of them mentions midlife, menopause, or aging. They do offer menopause care in the *Center for Specialized Women's Health*, but nothing about the name of the program would indicate that they specialize in midlife care. Likewise, Cedars Sinai Hospital has 18 subcategories on their *Women's Health* homepage, and none of them address menopause or age-related issues. Even Johns Hopkins' timeline of women's preventative care for women neglects women in the 50-65 age range.

Figure 1. Example of how the Johns Hopkins website neglects to address preentative care for women in the 50-65 age range. Text not intended to be read.

In addition to the scant resources on midlife women's health, accessing the limited care that is available can often be difficult and frustrating. Healthcare delivery systems are fragmented due to increased complexity and heterogeneity (Piña et al. 2015), and information transmitted both within a hospital system and to the public can often rely on inefficient modes of transmission, and may have dated and paternalistic content.

Patient stakeholder feedback was solicited at two points during the project. The first round of stakeholder feedback was important for determining the top concerns women face as they age. Many women experience physical symptoms of menopause such hot flashes, sleep disturbances, weight gain, a depressed mood, memory changes, difficulty concentrating, and sexual changes like a decreased libido and vaginal dryness (Woods and Mitchell 2016). In addition to the physical symptoms associated with hormonal changes, many women are concerned about general aging issues such as cancer risk reduction, diabetes, cardiovascular disease, maintaining healthy joints and muscles, and mental health.

Stakeholder feedback, as well as published studies and papers, also helped inform the format that the visuals took. The digital revolution and rise of smartphone technology and social media over the last decade has completely changed the way patients access information. Some of the most effective tools to educate the public about a new model of care includes social media and short explainer videos. Social media is a great way to access disadvantaged and underserved populations. A 2016 Canadian study showed that participants with lower baseline social support were more likely to use social media, and that social media users were disproportionately from lower-income households (Welch et al. 2016). Online video consumption is increasing, and evidence has shown that explainer videos not only increase the knowledge level of the consumers, but they also increase consumers involvement.

The second round of patient stakeholder feedback helped to determine the efficacy of the animation and illustrations. The objective was to create appealing and engaging visuals that would speak to a diverse patient population. Stakeholder feedback from our target audience was necessary to determine if the stated objective was successful.

First Round of Stakeholder Feedback

Stakeholder feedback from the target demographic was solicited to help determine the predominant concerns of our patient population audience. Eight patients in the mid-50's to mid-60's age

range were asked 5 questions that helped direct both the content and the format of the final project *(see appendix A)*. The answers to those questions and the subsequent conversation lasted one hour and was held over Zoom. The invited participants were drawn from a breast cancer listserv, but were instructed to answer the question from the perspective of general aging and overall wellness, not with regards to a specific diagnosis. After the conclusion of their participation, the stakeholders were thanked for their participation with a 10 dollar gift card to Amazon or Starbucks.

One barrier to accessing healthcare that was repeatedly cited was frustration with navigating the system. Scheduling appointments, knowing who to see, and inconvenient hours were all cited as being frustrating and burdensome.

Health concerns among the participants were varied, but included weight gain, diabetes, sexual wellness, mental health, cognitive health, and general menopausal symptoms. Participants talked about a general dissatisfaction with healthcare information regarding stigmatized topics like sexual wellness and mental health. Participants also talked about feeling generally isolated, and the benefits of having a support group of women to lean on through the menopausal transition.

There was an overwhelming preference for digital media over printed materials. Participants indicated an overall preference for web-based information that can be easily accessed and easily forwarded to friends and family. Video was cited as a preferred learning method because it utilizes visual and auditory learning pathways to reinforce the information.

Survey

In addition to the individual stakeholder feedback, an anonymous survey was conducted to obtain feedback from a larger audience. Using the web-based platform Survey Monkey, a survey of 4 questions was emailed to patients, friends, and family *(see appendix B)*. The survey was active from December 29th, 2020 through January 22nd, 2021. There were 131 female respondents who were all over the age of 40. Similar themes to the individual stakeholder feedback emerged from the survey. Aging related concerns included maintaining healthy bones, muscles, and joints; maintaining cognitive function; maintaining mental health; cancer risk reduction, and reducing weight gain. The survey also showed a preference for web-based information, and frustration with scheduling appointments and navigating the healthcare system. Respondents indicated that the ability to see multiple doctors in one trip, telehealth, and a patient

navigator would make healthcare more accessible for them. The survey responses were used to help determine content for the second animation and images for social media posts.

Script Writing

Scripts for two animations were developed. The first animation introduces patients to the JHWWHAP. The objective of the first animation is to familiarize patients and referring doctors to what makes the JHWWHAP unique, and how their method for delivering healthcare is more convenient for patients and leads to better health outcomes. The second animation emphasizes the importance of healthy lifestyle choices. The objective of the second animation is to educate patients about the importance of healthy lifestyle decisions for aging well and the JHWWHAP can develop an integrated plan to address a patient's unique healthcare needs. Script writing was directed by Dr. Vered Stearns, Dr. Wen Shen, and Dr. Jenny Sheng. The main points were derived from the first round of patient stakeholder feedback, from the survey responses, and the scripts were written to be consistent with the messaging of the JHWWHA printed bifold. The scripts were developed to follow a typical narrative arc of explainer videos, which is as follows:

1). A premise is stated

2). A problem is presented

3). The business is introduced

4). A solution is presented

5).The solution is explained

6). Short summary repeating the name of the business and tagline

The scripts were limited to approximately 120 words, which is approximately 1 minute of narration. The most effective explainer videos are between 45 seconds and 1 ½ minutes. The shorter a video is, the likelier it is that the viewer will watch it in its entirety. The goal for this project was to keep both animations to 1 minute in length.

The first animation introduces potential patients and referring physicians to the JHWWHAP and educates them about how the JHWWHAP differs from other models of care. Middle-aged women will identify with the main character, her busy life, and her frustration with scheduling appointments, seeing multiple providers, and managing her own healthcare. The JHWWHAP is introduced and their solution of streamlined visits, coordination and communication between providers, pre-consultation testing, and

a patient road map is presented. The role of the patient navigator is explained. The tiers of care that the JHWWHAP provides is stated – a one-time consultation, yearly check-up, or ongoing care. The video ends by repeating the name of the program, and their tagline – at Johns Hopkins, we are strong in aging. After watching the video, patients will have a better understanding of what the JHWWHAP is, and how can help them meet their healthcare needs *(see appendix C)*.

The second animation conveys the importance of healthy lifestyle decisions, and shows how the JHWWHAP can help patients make better decisions for their overall wellness. The script starts by listing many health issues that are important for maintaining a high quality of life after menopause. The viewer will identify the main character who wants to age well but doesn't know where to start. The JHWWHAP is introduced and their solution of developing a personalized integrated plan for healthy aging is explained. Regular check-ups, along with healthy lifestyle choices play a key role in aging well. After watching the second animation patients will have a greater understanding of how the JHWWHAP can help them develop a personalized prescription for wellness. The animations are not meant to be viewed in a specific order, and the information from each animation can stand on its own. Understanding the second animation is not dependent upon having watched the first animation *(see appendix D)*.

Up to 36% of the United States population has limited health literacy (Corrarino 2013), making it imperative that the information in the scripts is not only accurate, but also written at a level that most patients can understand. The scripts were revised and edited to be easily understood by a patient at a high school reading level with limited health knowledge. When the scripts were finalized, they were recorded by Laura Ekl, a student in the department of art as applied to medicine. The narration was recorded on a Blue Snowball microphone and edited in Adobe Audition.

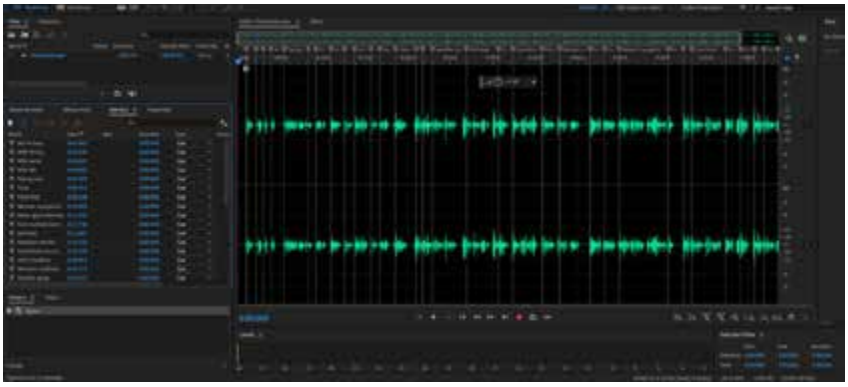


Figure 2. Screenshot of voice over layout edited in Adobe Audition. Text not intended to be read.

Storyboarding & Animatic

Once each script was finalized, a storyboard was developed. The script was broken down into scenes, and sketches were created to determine what the final assets might look like and to determine the flow of the animation. The storyboard template was created in InDesign and printed so that the storyboard could be sketched in pencil by hand *(see appendix E)*. The sketches were then scanned into the computer and cropped in photoshop to create sketches for the animatic. The scanned sketches were then imported and compiled in After Effects to create the animatic. An animatic is a rough draft of what the final animation will look like. The purpose of the animatic is to establish timing and create a rough guide to refer back to when working on the final animation.

Feedback from the patient stakeholders indicated a preference for clean, simple, graphics. The characters were developed to reflect the racially diverse target patient population of the JHWWHAP, and the icons were created to be easily understandable. Two-dimensional animation with vector assets was chosen for its clean and simple style.

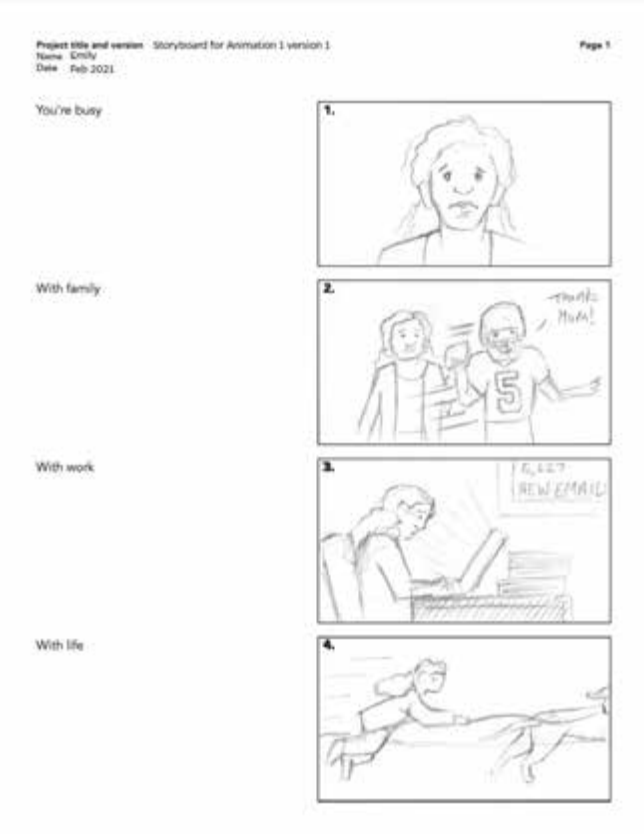


Figure 3. First page of storyboard for first animation. Text not intended to be read.

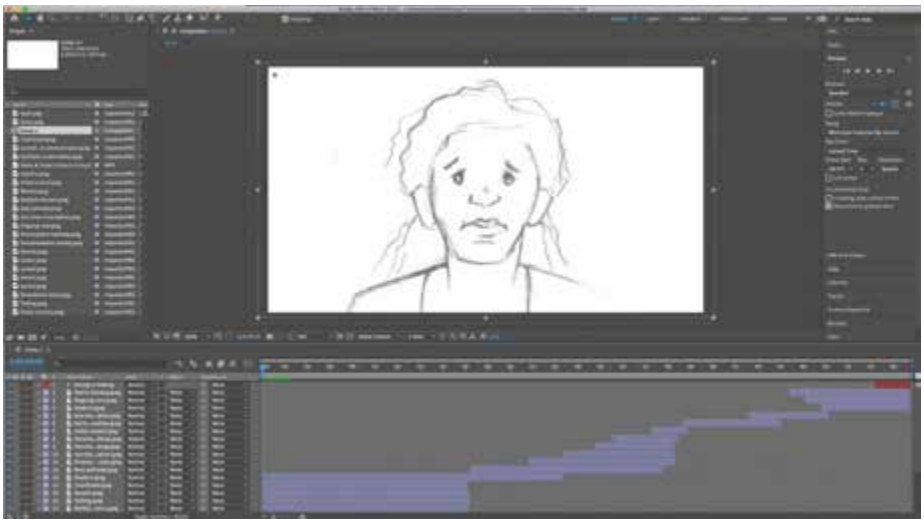


Figure 4. Screenshot of sketch imported into Adobe After Effects to create animatic. Text not intended to be read.

Making Assets

The final assets are vector graphics created in Illustrator. Vector graphics were chosen because of the ease with which they can be manipulated in After Effects, and for their clean and simple style. The scanned sketches were brought into illustrator and the vector graphics were drawn using the sketches as a template. The characters and icons were all created using the pen tool. The characters were developed to portray busy working middle aged women juggling the competing demands of work, home, and family life. It was important to portray a diverse group of women with various races, ages, and lifestyles represented. The icons were all developed the be simple and easy to read and understand quickly. All the assets for each animation were created on their own layer in one file to ensure uniformity and cohesiveness, they were then copied and saved as individual files to easily import into After Effects.

Making individual assets in this manor made for very easy workflow between Illustrator and After Effects for creation of the final animations, and for very easy workflow between Illustrator and Photoshop to create the static social media images.

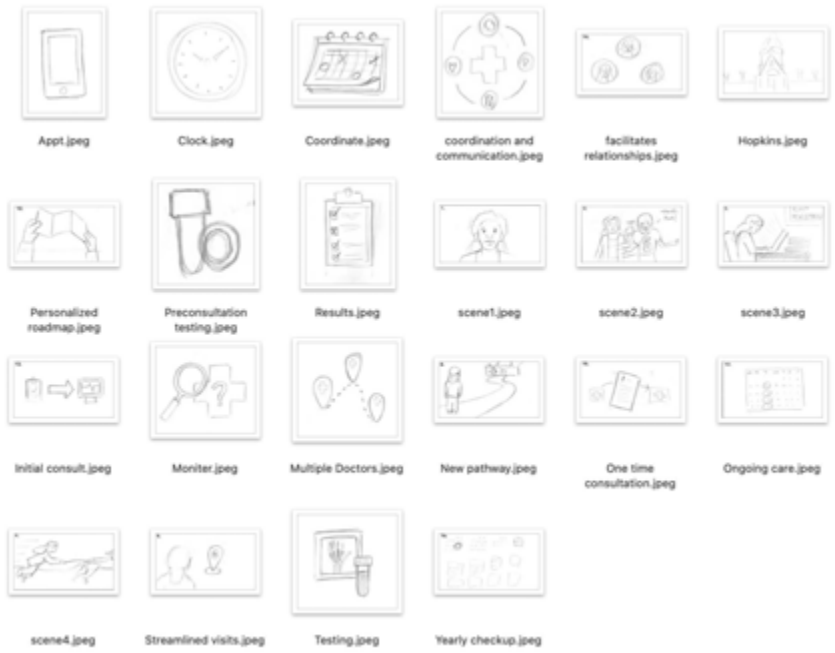


Figure 5. Sample pencil sketches that are brought into Illustrator to create vector assets. Text not intended to be read.

Figure 6. Screenshot of assets for the first animation created in one Adobe Illustrator document. Text not intended to be read.

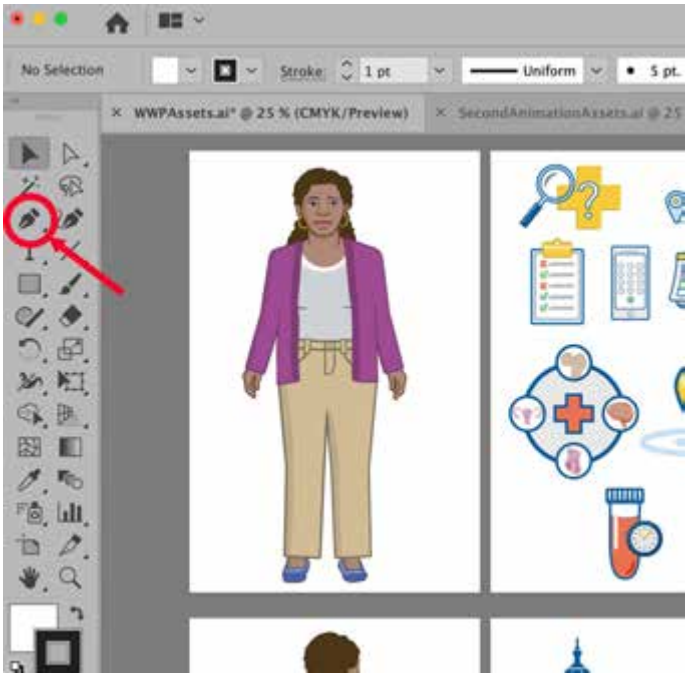


Figure 7. Screenshot of the Pen tool used to create all the the vector assets. Text not intended to be read.

Figure 8. Screenshot of individual asset copied into its own document. Text not intended to be read.

Figure 9. Screenshot of vector assets created for second animation. Text not intended to be read.

Final Animations

Both of the final animations were created in Adobe After Effects. The background music was purchased from Pond5, a digital stock media company. The final illustrator assets, along with the final recorded voiceover and background music, were all imported into After Effects to compile the final animations.

The individual assets were imported as either footage or as layered compositions depending on whether individual elements within the assets were being animated. All of the icons were imported as footage. Most of the characters, and the "Pathway to Comprehensive Care" scene in the first animation were imported as layered compositions so that individual elements could be animated.

The final animations consisted of primarily animating the position, scale, and opacity of the separate assets. The "easy ease" feature was used whenever position or scale was being animated to create a more lifelike effect. Puppet pins were used in the first scene of the first animation to achieve a subtle

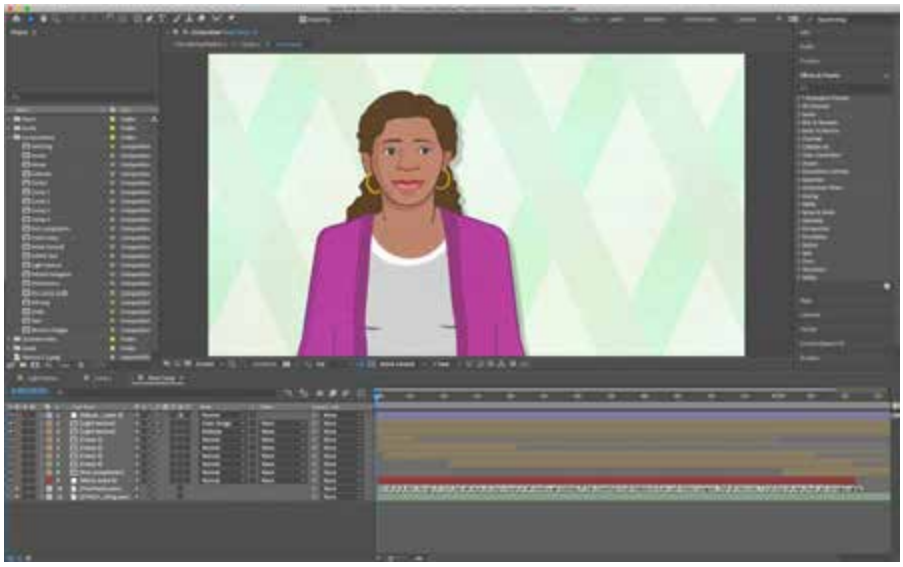


Figure 10. Screen shot of vector assets brought into Adobe After Effects to create the animations. Text not intended to be read.

shift in facial expression. The path in the "Pathway to Comprehensive Care" scene was animated on by using a feathered mask. The last scene with images of different women was animated by utilizing the 3D camera tool in After Effects and animating the position of the images along the Z axis as well as the X and Y axis's.

Figure 11. Still from the first animation. Text not intended to be read.

Different scenes in the animation were organized into separate compositions so they could be worked on individually and then assembled into the completed animation. This kept the number of layers in the completed animation composition to a reasonable number. The layers panel of the completed composition consisted of 5 compositions, two texture layers, one adjustment layer and two audio tracks. There were 21 total compositions nested in the completed animation.

When the first animation was almost complete, various effects were used in adjustment layers to create visual interest and soften the look of the vector assets. A turbulent displace texture was used on all layers except the text to make the line work look less mechanical. A watercolor wash was scanned into the computer and used on two layers in multiply and color dodge modes at a very low opacity to create visual interest. Drop shadows were used to create depth and dimensionality, and color adjustment layer was used so that the color saturation could be manipulated.

Social Media Illustrations

The suite of illustrations created for social media utilized the same vector assets that were created for the animations. The characters and icons that were created in Illustrator were brought into Photoshop to create a series of 20 illustrations formatted for Instagram and Facebook at 1080 x 1080 pixels. The illustrations reiterated many of the same topics and themes from the animations, but also covered some topics that weren't addressed in the animation due to time constraints.

All of the vector assets were placed in Photoshop as linked smart objects. This allows the original asset to be altered in illustrator, and when the file is saved the linked smart object in photoshop will automatically update. All of the illustrations were created on separate artboards in same photoshop file to ensure uniformity and cohesiveness. This also allows for easy export as either JPEG or PDF files.

Each of the illustrations contains "Johns Hopkins Women's Wellness and Healthy Aging Program" and their tagline, "We are SAGE – Strong in AGEing". The background of the illustrations is the same watercolor wash that was used as a texture in the animations, and the same drop shadow that was used in the animations was used on the assets in the illustrations for uniformity.

Figure 12. Screenshot of social media illustrations created on separate artboards in one Photoshop document. Text not intended to be read.

Second round of stakeholder feedback

A second round of stakeholder feedback was solicited 7 weeks after the first round to determine the efficacy of the visuals. Four participants, who had also participated in the first focus group, were invited to give feedback on the first animation and five completed illustrations. The animation, illustrations, and questions were emailed to all 4 women, and their reactions and feedback were discussed over a 1 hour long zoom session *(see appendix F)*. After the discussion, the participants were thanked with a $10 gift card to Starbucks or Amazon.

The reactions were primarily positive, with some ideas and suggestions on how they could be stronger. One participant did not like the style of the character and would have preferred the use of photography. Three participants found the style and the messaging appealing. Three participants reported having a greater understanding of the JHWWHAP after watching the animation, and reported that the animation and illustrations made them want to engage more with the program. Some of the participants were unfamiliar with the Johns Hopkins dome, which they misinterpreted as a church, so the visual synecdoche of using the dome to represent the institution was misunderstood.

Edits were made to both the animation and the illustrations reflecting feedback from the group. The script and assets for the second animation were developed based on feedback from the first animation and the conversation that it sparked among the patient stakeholders.

A third round of patient stakeholer feedback with a group 6 healthy women in their mid-50's through late 60's was solicited at the very end, after the project was completed. The purpose of this discussion was to see if healthy women had similar or different reactions than women with a breast cancer diagnosis.

Results

First Round of Stakeholder Feedback

The first round of stakeholder feedback was successful in determining the direction of the project and the general content that would be included. The hurdles to accessing care that were cited most often by the patient stakeholders were scheduling, not enough time, and not knowing who to see. This knowledge informed the content of the animation and the social media illustrations. The JHWWHAP is addressing these barriers with streamlined scheduling, coordination between providers, and a patient navigator, so these were the aspects of the program that were most prominently featured in the animation. Three of the patient stakeholders preferred video over reading materials, which confirmed that video was an appropriate format for educating patients about this program.

There was no one health topic that stood out among the patient stakeholders – weight gain, mental health, sexual wellness, cognitive function, cardiovascular health and bone health were all mentioned and treated with equal importance. At the conclusion, one of the participants shared "This is a great platform for everyone's concerns, it's great for everyone to be on zoom and know that we aren't alone in this" All of the participants echoed that feeling alone and isolated is one of the biggest concerns with aging, and they emphasized the importance of having a support system. These comments reinforced the importance of this project, and the necessity of programs like the JHWWHAP to serve this patient population that is often neglected by primary care physicians.

Survey

The 131 respondents to the survey provided a broader picture of what women are concerned about as they face midlife. Individual answers provided a few more aging related concerns like balance problems and thyroid issues. Respondents also mentioned a few more barriers to accessing good care such as unknown costs, and being shamed by doctors because of weight.

On the whole, survey responses echoed patient stakeholder feedback with regards to basic aging related health concerns. Overlaps between the two groups included maintaining cognitive health, maintaining mental health, and reducing weight gain. Two important concerns on the survey that were not brought up in the patient stakeholder meeting were maintaining healthy muscles, bones, and joints, and cancer risk reduction. Cancer risk reduction was not broached during the stakeholder feedback because

they had already received a cancer diagnosis and were instructed to approach the questions from the perspective of general aging and wellness.

With regards to preferred format for learning health related information, there was again an overwhelming preference for web-based materials. Videos were not preferred as highly on the survey as they were from the stakeholder feedback. However, with regards to what aspects of accessing good healthcare are burdensome, the top three answers in both groups were the same – scheduling appointments, not knowing who to see, and not having enough time.

While there were minor differences, the overwhelming overlap in aging concerns and healthcare frustrations between the stakeholder feedback and the survey responses confirmed that the content and format of the project were going in the right direction.

Animations

The duration of each of the final animations ran just over a minute. The characters were chosen to reflect the diversity of the patient stakeholder group. Background music aided the flow of the narrative. When the first animation was almost complete, a second round of patient stakeholder feedback was solicited to determine how effective the animation was in educating patients about the JHWWHAP, and to determine if there were changes that would improve its teaching objectives.

Revisions were made to the first animation based on patient stakeholder feedback. One asset in the “Coordination and Commincation” icon was modified to provide more clarity; a cross-section of a femur was not interpreted by the participants as a bone and was replaced with a spinal column. Participants said that the provider in the patient navigator scene didn’t look like a doctor, so she was given a white coat and a stethoscope. Labels were added to all three characters in the patient navigator scene and their positions were rearranged so there would be no doubt as to who is who.

Figure 13. Coordination and Communication scene from the first animation prior to patient stakeholder feedback. Text not intended to be read.

Figure 14. Coordination and Communication scene from the first animation after edits made as a result of patient stakeholder feedback.

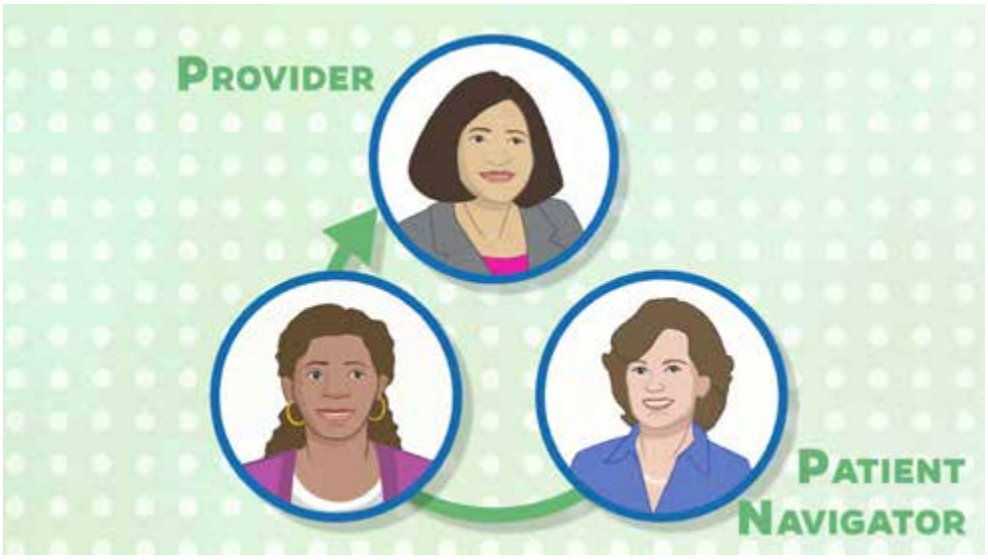


Figure 15. Patient navigator scene from the first animation prior to patient stakeholder feedback.

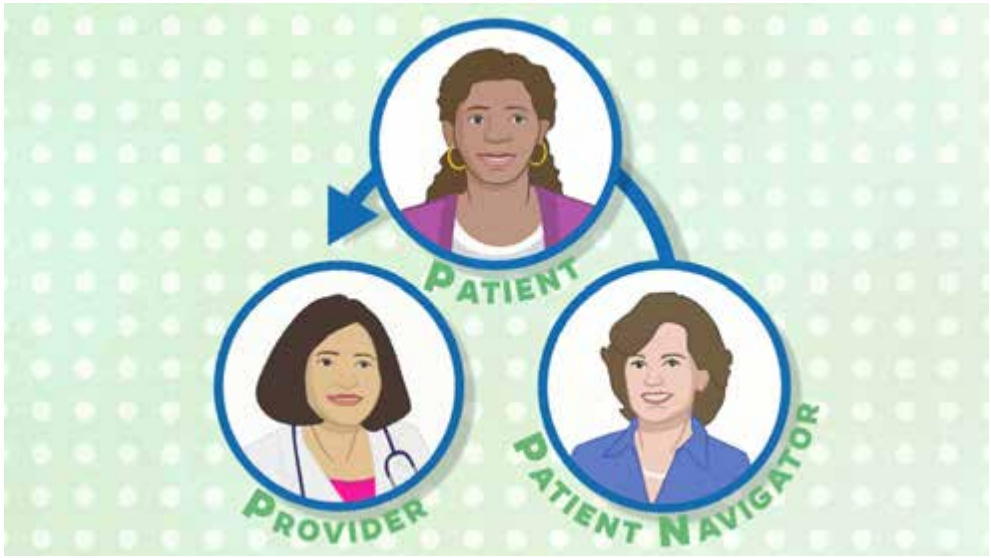


Figure 16. Patient navigator scene from the first animation after edits made as a result of patient stakeholder feedback.

Figure 17. Animation still from second animation.

The second animation was written adhering to the same narrative arc of explainer videos, and animated with a similar aesthetic to the first. The same background music was used to contribute to the uniformity of the videos.

Illustrations

Figure 18. Finished social media illustrations

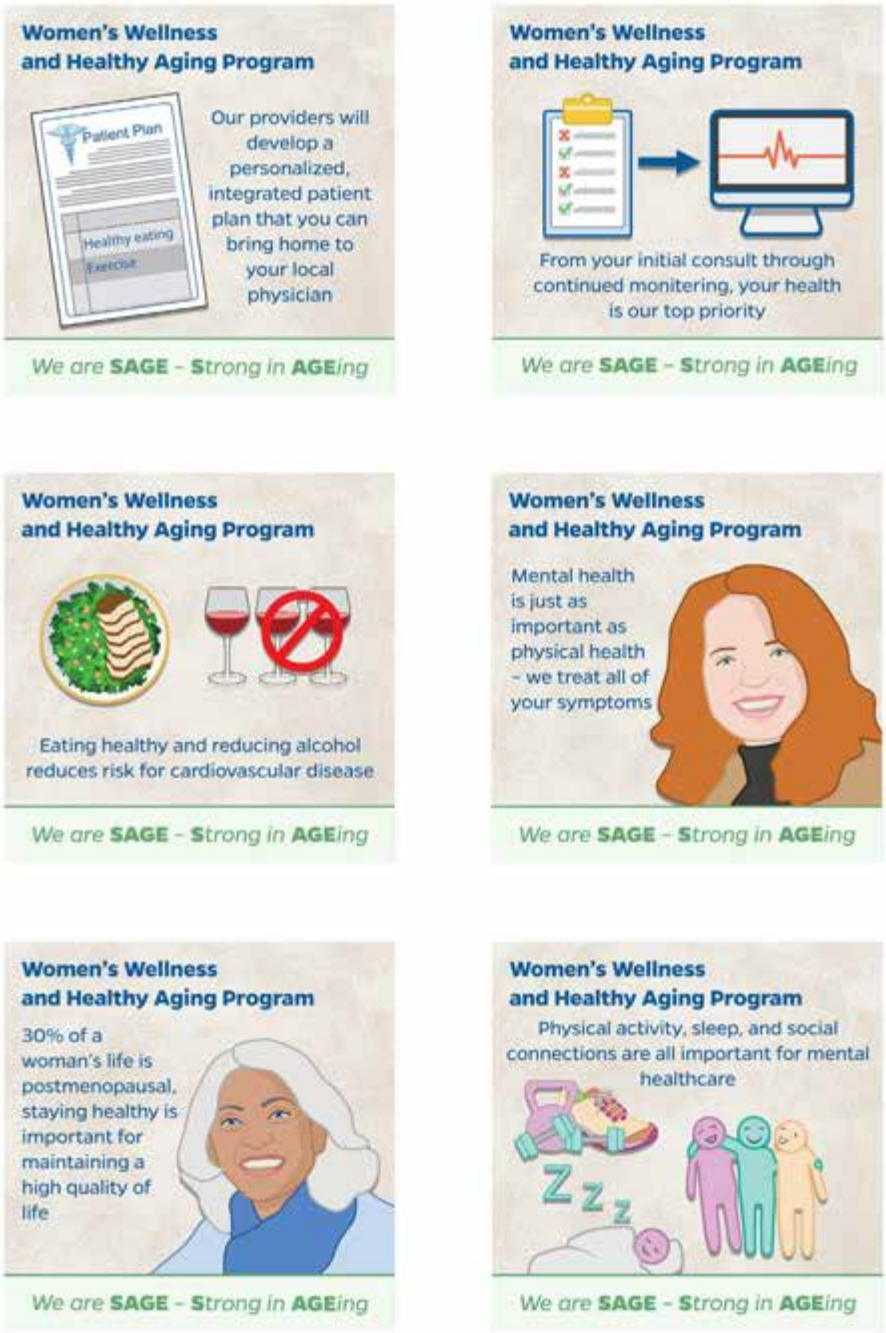


Figure 19. Finished social media illustrations

Figure 20. Finished social media illustrations

Figure 21. Finished social media illustrations

The final illustrations have imagery and content consistent with the information and aesthetic of the animations. Some of the text was lifted directly from the animation scripts, some of the text was based on content that could not be included in the animation due to time constraints.

When participants in the second round of patient stakeholder feedback were shown the animations and static illustrations, they were asked what other information they would like to learn about using this format. The phrase "prescription for wellness" came up repeatedly by the participants. They said that a prescription for wellness is something they would like for their doctor to talk to them about, as well as something they would like to see in a visual format such as animations and illustrations. The phrase could not be incorporated into the script for the second animation, which had already been recorded, but was incorporated into one of the illustrations.

Second Round of Stakeholder Feedback

The second round of stakeholder feedback was held 7 weeks after the first round. The four participants were shown a mostly completed first animation and 5 static illustrations. The reactions ranged from "I loved it" to "Honestly, it caught my attention, but I didn't like the cartoon, and had to watch it twice to understand the message"

Overall, the reactions were generally positive. Some of the patient stakeholder feeback that was incorporated into the subsequent edits were to make the doctor look more obvious, and to change part of the "Coordination and Communication" icon. There was some confusion about the tagline, "We are SAGE – Strong in AGEing." The patient coordinator of the program explained the meaning, which is the play on the word sage as a synonym for wisdom, but also a plant that has traditionally been used for medicinal and spiritual purposes. The participants liked the explanation once they heard it, but they didn't deduce that meaning on their own.

Aspects of the animation and illustrations that the stakeholders reacted the most positively toward were the diversity of the characters, the short clear simple narrative, and the aspects of the JHWWHAP that will make healthcare more accessible, such as a patient navigator and streamlined scheduling. One of the participants responded by saying "I noticed the diversity, it looked like participants from the original group, I thought it was great" Another participant, responding to the availability of a patient navigator through the JHWWHAP, said "Having someone tell you what you need will be helpful. Having a quarterback, having a centralized resource is important. I felt afloat and disconnected during the diagnosis and treatment for breast cancer."

Aspects of the animation and illustrations that were less well received included a lack of images of women at work, the need for clearer bullet points, the possibility that photographs would have been more relatable than vector illustrations, and that other Johns Hopkins locations could have been depicted. If more animations and illustrations were to be developed, participants talked about a desire to see information on sexual wellness, mental health, and a timeline of what they should be doing when during the aging process, ie. when to start getting colonoscopies, or whether to get a bone density test.

The third round of patient stakeholder feedback with healthy women at the completion of the project produced slightly different reactions to the animations and images. The patient stakeholders liked the

length of the animations, and responded to the illustrations without people depicted in them; however, they thought the women depicted in the images appeared too young. They loved the tagline "We are SAGE – Strong in AGEing", but they were confused over the term "wellness", which is often associated more with lifestyle choices than with a doctor in a hospital setting. The biggest observation was that it's very difficult to make images and write a script that appeal to the entire target patient population, while at the same time making individual women feel as though the program is appropriate for them. The dichotomies fell primarily along race, age, and health status. A 45-year-old black woman experiencing menopausal symptoms due to breast cancer is at a very different stage in life than a 58-year-old white woman experiencing menopause naturally. While the stakeholder feedback confirmed that short animations and illustrations on social media are an effective way to educate patients, the content of the animations and illustrations might have to be more specifically directed to different subgroups within the target patient population.

Access to Assets

Images resulting from this thesis will be partially found at www.EmilySlapin.com. Access to other files can be granted by contacting the author at Slapinillustration@gmail.com or through the website of the Department of Art as Applied to Medicine at Johns Hopkins University School of Medicine: https://medicalart.johnshopkins.edu/.

Discussion

There is a clear need for new developments in healthcare delivery, and an obvious dearth in programs and information that cater exclusively to the health concerns of perimenopausal women and women in their post-reproductive years. The patient stakeholder feedback confirmed a general dissatisfaction with difficulties in accessing care, and a lack of easily accessible information on health topics that they cared about.

Two concerns that surfaced repeatedly from both the patient stakeholders and survey respondents were difficulty navigating the system, not knowing who to see, difficulty getting appointments, not understanding benefits, and inconvenient hours; and, outdated paternalistic information on topics they cared about, particularly regarding menopause and sexual wellness. The JHWWHAP is addressing the first problem with streamlined scheduling and a patient navigator. The lack of easily accessible information can be solved with short, easily digestible videos and illustrations. Easy access to excellent care and up-to-date relevant information from physicians will reduce the percentage of women who change health providers in midlife. Because the JHWWHAP can develop a personalized patient plan for women to take back to their local providers, patients may choose to stay with physicians with whom they are satisfied in all areas except treatment of menopausal symptoms. Continuity in care is associated with increased patient satisfaction, increased take-up of health promotion, greater adherence to medical advice, and decreased use of hospital services (Gray et al. 2018).

The second round of patient stakeholder feedback confirmed that short animations and social media posts are an effective means to address the problem of a lack of information and outdated information. These visuals can be used to educate patients about this new model of healthcare and about health topics that are relevant to them. Education and engagement lead to an increase in self-care and self-efficacy among patients. This has been shown to have direct clinical improvements on conditions such as diabetes, coronary heart disease, heart failure, and rheumatoid arthritis (Paterick et al. 2017). In the face of escalating healthcare costs, the potential for improved health outcomes through patient education is immense.

The third round of patient stakeholder feedback also confirmed that short animations and social media posts are an effective way to communicate to patients, but that it is difficult to appeal to a large patient population of various races, ages, and health statuses. Having directed messages towards women

with a diagnosis vs. healthy women, or perimenopausal vs. post-menopausal women could be more effective in getting patients to engage with the JHWWHAP.

This new model for clinical care, combined with the use of short videos and illustrations to educate the patient population, has the potential to increase continuity in care, improve overall health outcomes, and decrease healthcare costs. A much longer longitudinal study will be necessary to confirm this hypothesis; but, the current research, combined with the patient stakeholder feedback, indicate promising results for this method of healthcare delivery.

Conclusion

As social media continues to change the way we access information, and the COVID-19 pandemic necessitates new pathways for delivering healthcare, the JHWWHAP could be a pioneer in the changing landscape of healthcare. Effective and engaging visuals are an important component in a media strategy to reach patients, and healthcare outcomes improve when patients are educated and engaged.

Stakeholder input and feedback were integral in the creation and revision of the animations and illustrations. The patient stakeholders identified the most burdensome aspects of accessing healthcare, and the age-related health topics that were most important to them. Ideally, with more time, several more rounds of feedback could inform subsequent iterations. The two completed animations and suite of illustrations are the beginning of what could be a project of much larger scope. The next step would be animations addressing the stigma of menopause, and educating patients how to seek treatment for menopausal symptoms. Different images targetted towards specific sub-groups of the patient population could be developed and tested. A website with cohesive branding to provide patients with more comprehensive information will also be an integral component of this new model of healthcare delivery.

This project resulted in effective and engaging animations and illustrations that will reach a broad audience when the JHWWHAP is launched. The ultimate objective is that these images will educate women about the JHWWHAP and inspire them to become engaged and involved patients. Health outcomes will improve when patients have more information about access to better healthcare.

Appendices

Appendix A – Questions for the first focus group

1) What format do you prefer for learning health related information (e.g. written, visual/infographic, video, website, smartphone application, paper…)? Again, this is in relation to preventative care and symptoms resulting from general aging and menopause, not a specific diagnosis.

2) What are your biggest barriers to accessing care? And what would help you access care more easily? What stops you from getting great healthcare? An example might be a 52-year-old executive who goes to the ER with cardiovascular symptoms who is told to follow up with a cardiologist, but who doesn't because of her busy schedule.

3) What aspect of accessing healthcare have you found to be most frustrating/burdensome?

4) What form of communication do you prefer using for communicating with your healthcare providers (e.g. email, text, phone, patient portal…)?

5) What health topic are you most concerned about as you age?

Appendix B – Questions for the survey

1) As you age, what aspects of overall health are most important to your sense of health, well-being, and quality of life?

2) What format do you prefer for learning about health related information?

3) What aspects of accessing good healthcare do you find to be most frustrating and/or burdensome?

4) Would the availability of any of the following make healthcare more accessible for you?

Appendix C – Script for the first animation

You're busy – with family, with work, with life.

Taking care of your own health and wellness takes time – time that you don't have – to monitor symptoms, make appointments, see multiple doctors, get tests, decipher results, and coordinate your own care.

The Johns Hopkins Women's Wellness and Healthy Aging Program is working to change this.

Our new pathway to comprehensive coordinated care provides streamlined visits, coordination and communication between providers, pre-consultation testing, and a patient roadmap for personalized care.

From your initial consult through continued monitoring, a patient navigator facilitates your experience and helps you establish relationships with providers.

Whether you would like a one-time consultation to take back to your primary provider, a yearly check-up, or need ongoing care, the Women's Wellness and Healthy Aging Program can meet your healthcare needs.

At Johns Hopkins, we are Strong in Aging!

Appendix D – Script for the second animation

Healthy muscles, joints, cognitive function, cardiovascular fitness, and emotional well-being are all important for maintaining a high quality of life. You want to feel your best, but you don't where to start.

At the Johns Hopkins Women's Wellness and Healthy Aging Program, we want to help you age well.

Our providers will develop a personalized integrated plan to address your unique healthcare needs. Regular check-ups, along with eating a balanced diet, exercising, limiting alcohol, and getting enough sleep, all play a key role in fighting infections, reducing cancer risk, and maintaining a healthy heart, brain, and bones.

Our integrated multidisciplinary approach will help you stay healthy through menopause and beyond.

At Johns Hopkins we are Strong in Aging

Appendix E – Storyboards for animations

Storyboard for first animation, text not intended to be read:

Project title and version Storyboard for Animation 1 **Page 1**
Name
Date

You're busy

With family

With work

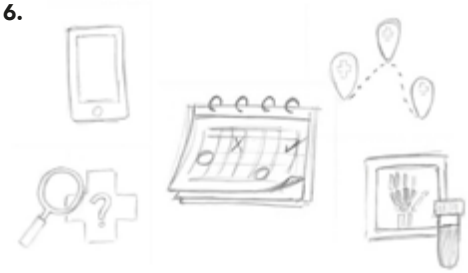
With life

Taking care of your own health and wellness takes time – time that you don't have

5.

To monitor symptoms, make appointments, see multiple doctors, get tests, decipher results, and coordinate your own care.

6.

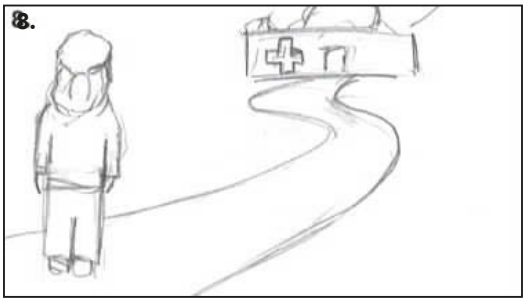


The Johns Hopkins Women's Wellness and Healthy Aging Program is working to change this

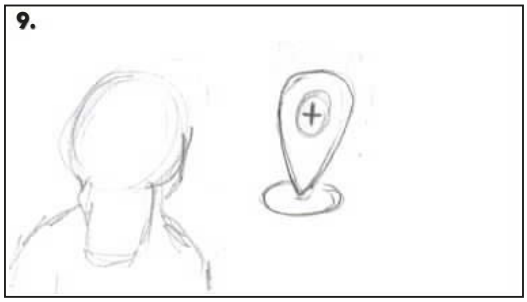
7.

Our new pathway to comprehensive coordinated care provides

8.

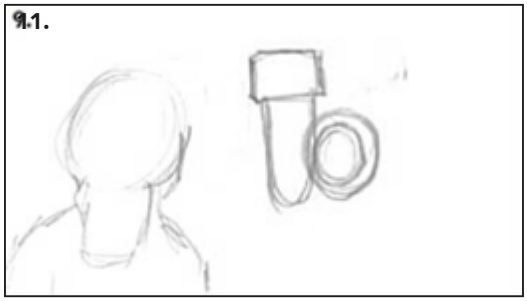


Streamlined visits

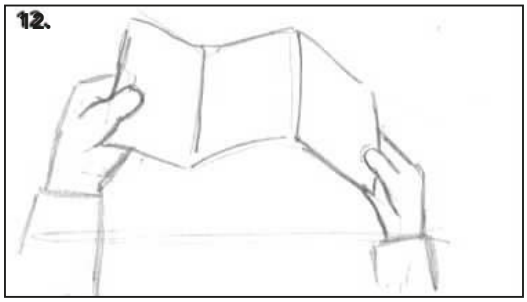


Coordination and communication between providers

Pre-consultation testing

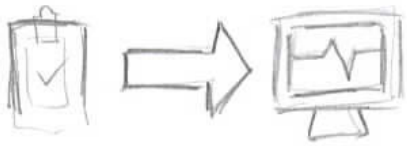


And a patient roadmap for personalized care



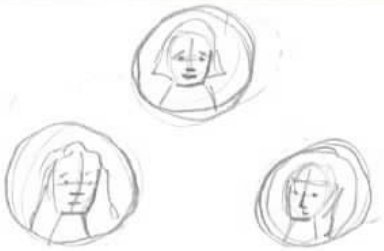
From your initial consult through continued monitering

13.



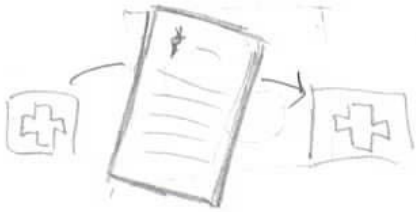
A patient navigator facilitates your experience and helps you establish relationships with providers

14.



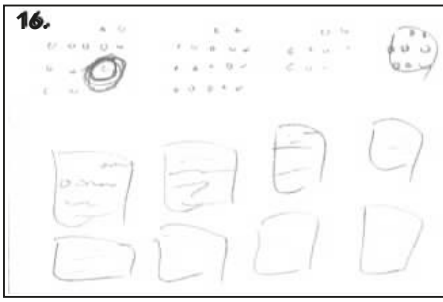
Whether you would like a one-time consultation to take back to your primary care provider

15.



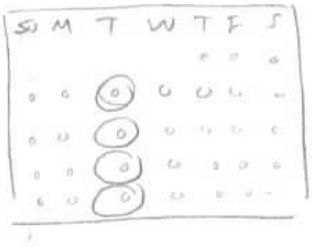
A yearly check-up

16.



Or need ongoing care

17.



the WWHAP can meet your healthcare needs

18.

(images will be vector illustrations and zoom on)

At Johns Hopkins we are Strong in Aging!

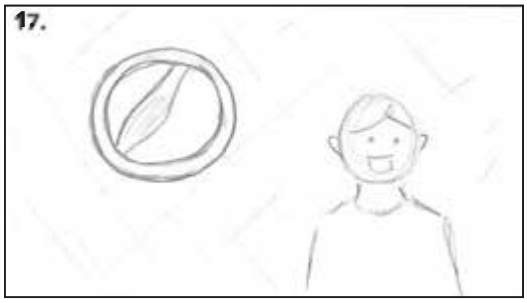
19.

We are **SAGE** – Strong in **AGE**ing

Storyboard for 2nd animation, text not intended to be read:

Project title and version Storyboard for Animation 2
Name
Date

Healthy muscles, joints, cognitive function, cardiovascular fitness, and emotional well-being are all important for maintaining a high quality of life.



You want to feel your best

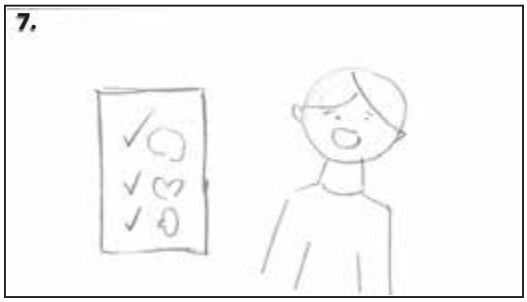
But you don't know where to start

At the Johns Hopkins Women's Wellness and Healthy Aging Program

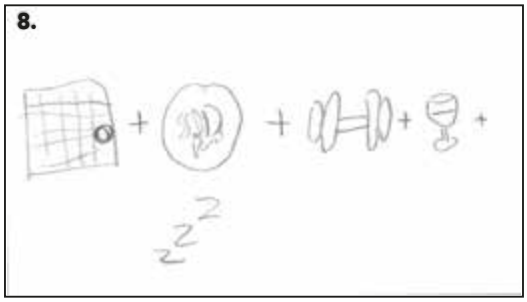
We want to help you age well

Our providers will develop a personalized integrated plan

to address your unique healthcare needs



Regular check ups, along with eating a balanced diet, exercising, limiting alcohol, and getting enough sleep



All play a key role in fighting infections

9.

Reducing cancer risk

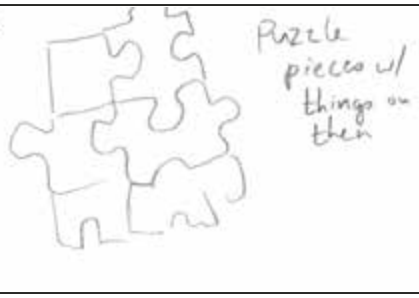
10.

And maintaining a healthy heart, brain, and bones

11.

Our multidisciplinary approach will help you stay healthy

12.



Through menopause and beyond

13.

At Johns Hopkins we are Strong in Aging

14.

(images will be vector illustrations and zoom on)

15.

We are **SAGE** – Strong in **AGE**ing

16.

Appendix F – Questions for the second focus group

1) What is your initial reaction to the video?

2) Do you feel like the video and flat images are relevant for women at your stage of life? Do they address issues that affect you?

3) Do the video and flat images inspire you to learn more about the Women's Wellness and Healthy Aging Program? Is there additional information that would further your interest in the program?

4) What other information would you like to learn about using this format?

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Vita

Emily Slapin Lufkin was born in Summit New Jersey and spent her formative years in Basking Ridge where she attended Ridge High School. Inspired and encouraged by her high school art teacher, she attended the Rhode Island School of Design where she received a Bachelor of Fine Arts in Illustration with a minor in Art History. It was at RISD, under the tutelage of Anthony Janello and Jeff Hesser, that Emily developed a passion for figure drawing and love of anatomy. This love of anatomy led Emily to pursue a Master of Fine Arts in Drawing with a concentration in Anatomy from the New York Academy of Art. During her two years at NYAA, in the drawing and sculpture classes of Noah Buchanan and John Horn, she developed a deep appreciation for, and understanding of artistic anatomy, proportion, structure, and form. After receiving her MFA, Emily taught undergraduate and continuing education classes in Figure Drawing, Artistic Anatomy, and Illustration for 8 years.

Looking to further her anatomical knowledge, and combine her classical training with a love of visual communication and storytelling, Emily went back to school to complete the scientific prerequisites needed to pursue a graduate degree in Medical Illustration. In August of 2019, Emily matriculated into the Medical and Biological Illustration graduate program in the Department of Art as Applied to Medicine at the Johns Hopkins School of Medicine. Emily will receive her Master of Arts in May 2021. After graduation she is looking forward to using her knowledge and skills to educate lay audiences and improve health literacy for patients.