

## CONCEPT NOTE

Heart disease is the #1 killer of women worldwide. **WomenToHeart** is an online tool to help women identify and communicate their symptoms via metaphors, rather than the traditional pain scale, as heart attack survivors intuitively do. Our empowering approach helps women understand their early warning signs and slow on-set symptoms in order to seek help sooner.

## BACKGROUND

**How might we help women to recognise the symptoms of heart attack and to seek help in a timely manner?**

Without anticipating it, our research proposal guided our entire process for this competition. Since we discovered that heart disease is the #1 killer of women worldwide and that women are being seriously underserved by the medical community when it comes to heart disease, we have made it our mission to find a way to help women **recognise the symptoms of heart attack and to seek help in a timely manner.**

"Only one third of cardiovascular clinical trial subjects are female and only 31% include results by sex"- 2014 Brigham and Women's Hospital Report. As a result, diagnostic tools created by studying the symptoms and cases of primarily men are less effective to **diagnose women's heart attacks.**

**Women are unaware they can be at risk for a heart attack and what the symptoms could look like.**

95% of women experienced prodromal symptoms (early warning signs) in the month leading up to a heart attack. (*American Heart Association Journal*)

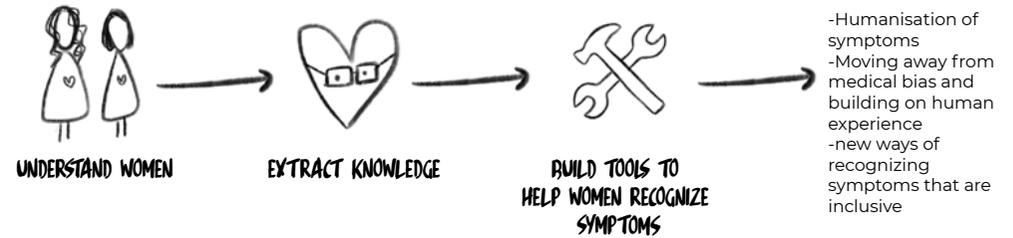
Women experience slow-onset symptoms as opposed to sudden symptoms, and may not feel as serious as the collapsing on the floor preconception (*Carolyn Thomas, Heart Sisters Journal*)

Women are more likely to experience more non-chest related symptoms than men such as: unusual fatigue, nausea, heartburn, and vomiting that overlap with non life threatening diseases. (*Carolyn Thomas, Heart Sisters Journal*)

It's not a surprise then that "women are more likely to minimize their symptoms and delay seeking help, waiting longer before calling 999 after experiencing heart attack symptoms" (*British Heart Foundation*)

When looking for help, women face an additional challenge: in our research we discovered that they struggle to communicate their symptoms effectively. In the meantime, healthcare professionals have trouble recognizing symptoms because women can experience non-chest related symptoms, which are harder to diagnose and to communicate.

## IT WAS CLEAR WE NEEDED TO CLOSE THIS COMMUNICATION GAP. BUT HOW?



## PROCESS

COVID-19 turned the world outside in and we couldn't access participants in the same way that we wanted to. We decided to pivot and analyze inspiring stories we found of real women talking about their experiences in forums. Also, we collected valuable insights from doctors, nurses, medical students, and heart attack survivors. Through a stroke of serendipity, we connected with Carolyn Thomas, a Mayo-Clinic Trained, women's heart health advocate and heart attack survivor blogger.

This encounter made us focus on two key aspects:

**Women tend to over explain their symptoms and under diagnose themselves.**



"I cannot count the number of times I recall a physician asking: 'Tell me about your chest pain', and the woman responding: "Well, I don't really have pain. I have discomfort, it's more like pressing. I would describe it more as a bad ache". And much to my amazement, the physician writing: 'No CP' - no chest pain!" (*Catherine Kreatsolous, Heart Research Fellow at the Harvard School of Public Health*)

**Some women have found effective ways to describe their symptoms through metaphors.**



"It's not enough if a woman simply says she is tired. The physician needs to know how it's relating to her daily functions - so how tired are you? One example a reader gave me was "I am so tired I can't even lift my laundry basket. Now, that's not normal tiredness. That's unusually tiring."

Through everything we learned, we recognized a system that needed to be addressed in order to change the current trajectory of women's heart health for the better. With COVID-19, the propensity for delay seeking help behaviour has grown even more, and the need for early detection is greater than ever.

| SYSTEM MAP                    |  <h3>AWARENESS</h3> <p>To be able to act on their symptoms when having a heart attack, women need to be aware that they can actually have one and that a heart attack is not an "old man thing". It can happen to anyone even if they are healthy, at any age and without having a family history of heart attacks.</p> |  <h3>EARLY WARNING SIGNS</h3> <p>Women can exhibit low level symptoms for a week or months leading up to a heart attack and may get used to the pain and or justify it, which causes a delay in seeking help and impacts their ability to know and trust their bodies</p> |  <h3>STRONGER SLOW ONSET SYMPTOMS</h3> <p>Experiencing slow-onset symptoms as opposed to sudden symptoms, and may not feel as serious as the chest-clutching, collapsing on the floor preconception. Women are also more likely to experience more non-chest related symptoms than men varying from unusual fatigue, nausea, heartburn, and even vomiting that overlap with non life threatening diseases. This can cause women to delay seeking help in order to avoid overreacting or acting like a hypochondriac.</p> |  <h3>REACH OUT FOR HELP</h3> <p>Family, friends and partners play a key role in aiding women to avoid delays when seeking help. Women may not know how to communicate their symptoms effectively, or partners may not raise alarm bells when their female counterparts express pain. In both cases, communication/language used to describe symptoms can be the key to close the gap and mobilize support.</p> |  <h3>TAKE ACTION (ER)</h3> <p>If a woman successfully gets herself to the ER or GP appointment, she then needs to communicate her symptoms to the attending doctor. At the same time, doctors will have to ask the right questions to give a proper diagnosis.</p>   |  <h3>REJECTIONS/ MISDIAGNOSED</h3> <p>When a woman has been misdiagnosed, her confidence tends to reduce which impacts her ability to trust her body and communicate how she feels. It can also increase the fear that they are "overreacting" or acting like a hypochondriac. In the end, this can cause delays in seeking help the next time they experience symptoms.</p> |
|-------------------------------|---|---|---|--|--|--|
| AREAS OF OPPORTUNITY          | <p><b>Raise awareness about key messages:</b></p> <ol style="list-style-type: none"> <li>1. ALL women can have a heart attack, even if you do not have any risk factors.</li> <li>2. Coronary heart disease kills more than twice as many women as breast cancer in the UK</li> <li>3. Heart attacks are definitely not only an "old man thing"</li> </ol>  | <p>Help women to identify early warning signs of a heart attack.</p>  | <ol style="list-style-type: none"> <li>1. Raise awareness about slow onset symptoms of a heart attack</li> <li>2. Provide women with stories of other women who have experienced similar symptoms and symptoms statistics</li> </ol>  | <ol style="list-style-type: none"> <li>1. Help women to better understand how they feel and communicate their symptoms to their support system.</li> <li>2. Help women's support system to be more supportive of their female symptoms.</li> <li>3. Help partners to pay better attention to their female counterparts by identifying unusual behaviours, reactions.</li> </ol>  | <ol style="list-style-type: none"> <li>1. Help women to better understand how they feel and communicate their symptoms to healthcare professionals.</li> <li>2. Provide women with up-to-date data about women's heart health and tools to understand diagnostics steps.</li> <li>3. Help healthcare professionals to get relevant and actionable data that can lead to a faster and accurate diagnose.</li> </ol> |  |
| PROPOSED SOLUTION OR FEATURES |  <p>Partners:</p> <p>Landing page message.<br/>Google search key text.</p> <p>Pop messages and Informative header description with reliable statistics and facts to educate women about all symptoms - Blogs, interviews, articles, videos published in our website</p>  |   | <p>Women's stories video feature<br/>Interactive statistics infographic feature</p>   | <p>Prompts feature</p>   | <p>Downloadable and personalized risk report.<br/>Downloadable symptom journal.</p>  | <p><b>Future feature: Forum &amp; physical prompt cards.</b></p>   |
| RESEARCH QUOTES/ FEEDBACK     | <p>"I never truly believed that, at not even 30 years old, I could actually be having a heart attack. I cursed myself for being stupid - for leaving it all so long" - Kathleen, 29, UK</p>   | <p>I remember feeling a squeezing heart sensation, but with no pain, it really didn't hurt. I only felt pain in my upper back between my shoulder blades and a bit of pain in my arm. I also remember having several asthma's attacks - Debra, 42, USA</p>  | <p>I began to normalize them even as they grew increasingly debilitating. This must just be what acid reflux is like. How can other people with acid reflux stand this? - Carolyn Thomas, 76, USA</p>   | <p>"It would be very helpful to identify what are the key words the doctors need to hear to pay attention" - Heart attack survivor and BHF forum member</p>  |  | <p>"I'm concerned when someone says the pain is so severe that it prevents them from carrying out daily tasks. Or when the pain is so severe that it feels like someone is inflicting pain on them" - Healthcare professional survey answer.<br/>"These prompts are great! Big changes in function are a good way to try to quantify or quality pain or symptoms. This is specific and helpful!" - Healthcare professional survey answer.</p>                  |

## From there we developed a range of features that could address each part of the system:

 **Awareness mainly through apps embedded in their current lifestyle.** Why create something new if we can potentialize the impact by inserting awareness messages into their existing lifestyles?

 **Online checkup with videos and statistics of real women heart attack survivors describing their symptoms.** Empowering women by making them feel less lonely, not like a hypochondriac and boosting their confidence to trust their body to avoid delay seeking help was one of our most important goals.

 **Cards or prompts to help them identify their symptoms and use metaphors to communicate their pain or discomfort level.** Addressing the description of symptoms, especially the level of pain and discomfort became our obsession. 7 out of 9 healthcare professionals who answered our survey agreed that patients in general struggle to communicate their symptoms. "It's hard to put pain into words; different education levels of patients; cultural differences that mean some people don't admit symptoms because they don't want to show weakness" - Healthcare professional survey answer. We believe we can positively impact rates of mis and under-diagnoses by increasing women's awareness of their bodies and helping them to effectively communicate any symptom. "Awareness is needed but being done, forums are plenty, but this piece in the middle, the prompts, they are novel and needed and not available anywhere else!!" - Carolyn Thomas, Mayo-Clinic Trained, women's heart health advocate and heart attack survivor blogger.

 **Finally, a journal to build awareness of their bodies** that can make a difference when diagnosing a heart attack in its early stages and a **personalized report** with risk profile, suggested key actions, tips on what to expect in her interactions with healthcare to empower with the knowledge needed to get a faster and accurate diagnosis.

Do you think some patients tend to struggle to communicate their symptoms?

9 respuestas



Would you find a tool to help patients to communicate symptoms through metaphors valuable?

9 respuestas



As we mentioned earlier, 95% of women experience early warning signs, also called prodromal symptoms, in the weeks or months prior to a heart attack. In fact, women who experienced **one or more** of five most common prodromal symptoms are **FOUR TIMES** more likely to have an adverse cardiac event. Therefore, our main service not only works for women at high risk of having a heart attack but for those who are experiencing these symptoms while continuing on with their lives.

## LOOKING INTO THE FUTURE

**How can we use this data to help doctors to diagnose faster?  
How can we contribute to women's heart research and advance the tools and save lives?**

In our research, we noticed a large number of forums and Facebook groups of women's heart attack survivors looking to be heard and to help others. We firmly believe that the collective knowledge of these women can save lives. In the future, we would like to add a forum for women to share their stories. The system will analyze their stories and "Women to Heart"'s historical data to create infographics that can help researchers and doctors to increase the understanding of words used by women to describe their symptoms (also known as 'Cardiolinguistics').

**How can we make our service more inclusive?  
How can we contribute to close the gender gap?**

The reality is that the gender gap exists not only reflected widely through this report but in the access to the internet. In the future, we would like to make this service available offline to be used by healthcare professionals on face to face interactions. The educational barrier and your ability to put together words cannot be the difference between life and death for low income and disadvantaged women worldwide.



## SERVICE BLUEPRINT

### Stage

awareness

first symptoms

### Timeline

--- day 1 ---

day 42. 9:45 AM

day 42. 10:00 AM

### Alice's story

GREAT JOB!  
YOU KNOW I WOULD  
THINK ABOUT GETTING  
HEALTHIER TO BE THE  
NEXT PRINCESS OF THE  
LEADING NATION

Alice starts seeing heart attack related awareness messages pop up on her Apple watch - it's interesting because she has never thought of heart attacks before

I'M SO TIRED  
AND I'VE BEEN  
GETTING INDIGESTION  
SO MUCH LATELY  
WHAT COULD IT  
BE?

Alice experiences her first symptoms. She is not sure what is wrong but she feels unwell.

Google

She searches her symptoms and finds Women to Heart, an online heart health check-up. The search result catches her attention. She remembers the notification on her phone.

Women to Heart  
Heart Checkup

Alice clicks on the Women to Heart Checkup link and decides to give it a try

### Channels and touchpoints

Smart watches, fitness bracelets, Key apps and websites.

Be informed about general aspects of her health. Be informed of potential health risks in order to take responsibility for her health.

Understand why she is feeling these symptoms and what she can do to address them.

Find trustworthy information that she can use to understand what to do in relation to her symptoms.

Decide quickly if she can trust this site. Understand what is this site about.

### Alice's needs

### Emotional journey



### Front stage actions

Push notification to a device or an app. Marketing email from a partner.

Place website link in the top of searching results.

Make the website visible.

### Backstage actions

Partner algorithm to identify Alice as a target user with her health data and find ideal time to push notifications

SEO plan to push website to top results with any heart attack symptoms

Domain and hosting fees updated

Publish content in websites

### Support process

Partnership with key health apps or devices, frequently used websites, key brands and influencers

SEO plan: partnership with high-rated and trusted sites, Google trends keyword search.

Domain, hosting fees and general site upkeep plan

Personalisation of content for key partners

Push web-content about all heart attack symptoms. Blogs, interviews, articles, videos.

Showcase partnerships, disclaimers, sponsors

Incentive plan for businesses to align CSR business strategy to address women heart health

Prodromal symptoms messages plan

### Sustainability actions

Reuse existing solutions rather than creating new ones

Code and graphic optimisation for making a website fast and less energy demanding

Partner with companies and organisations that believe and apply circular economy and sustainability principles (check on lists like [www.cdp.net](http://www.cdp.net))

Check and improve a carbon footprint of the website on <https://ecograder.com/> or <https://www.website-carbon.com/>

navigate and explore

take actions

reflect

day 42, 10:15 AM

day 43

day 52

|  |   |   |  |   |   |  |  |  |   |   |
|--|---|---|--|---|---|--|--|--|---|---|
|  <p>Alice watches the video and agrees to the terms and conditions</p> |  <p>Alice fills in the form and realise that she actually has 2 risk factors</p> |  <p>Alice select her symptoms. She strggles to remeber if she has experienced other symptoms in the past month</p> |  <p>Alice reads the statistic and plays the videos. She starts to think she might be at risk of having a heart attack</p> |  <p>Alice answers the prompts and fill in the blanks . Some of them are difficult to answer. She wonders if she should tell her partner how she's been feeling</p> |  <p>Alice reads her results carefully. She clicks in the link to understand what "prodromal symptoms" are. She writes down a list of actions for her to take (symptom journal, talk to friends, call a doctor)</p> |  <p>Alice shares her results with her partner and he asks her about the site legitimacy. Alice uses the prompts to explain how she's been feeling. He agrees her symptoms are unusual and suggests her to book a doctor appointment</p> |  <p>Alice starts filling her symptom journal. She recalls more instances of symptoms and adds everything she now remembers and ignored before. She also includes new symptoms she notices doing day-to-day activities</p> |  <p>Alice sets up an appointment with her GP. She brings her symptom journal and explains her symptoms using prompts. Her GP is concerned and orders some heart tests</p> |  <p>The tests show that Alice's heart arterial walls are 45% obstructed. Alice's doctor diagnoses her with non-obstructive heart disease</p> |  <p>Alice receives a follow-up email from Women to Heart. She is thankful for the service and how it empowered her to seek diagnosis and treatment. She decides she want to allow her data to feed back into the service to help fututre women</p> |
|--|---|---|--|---|---|--|--|--|---|---|

Women to Heart website

Digital or printed report

Digital or printed journal

Digital or printed journal

Follow-up email, Women to Heart website, feedback form

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|---|--|--|--|---|---|---|--|--|--|--|
| <p>Understand general steps of the process. Understand how her data will be used.</p> | <p>Be able to easily answer the questions. Understand why questions are being asked.</p> | <p>Easily comprehend the language. Remeber any other symptoms she might had experienced in the last two weeks.</p> | <p>See videos quickly. Trust the statistics. Make connections between her symptoms and the experiences of the women in the videos.</p> | <p>See all the symptoms that she selected and respective prompts. Be able to fill in the prompts.</p> | <p>Digest easily these results. Know where her results are coming from. Save a copy of her prompt answers and her report. Download the symptom journal with additional prompts.</p> | <p>Share her feeling with her partner. Be sure that her partner supports her in using Women to Heart website.</p> | <p>Be able to write the evolution of her symptoms. Add past events she is now remembering.</p> | <p>Be able to explain effectively her symptoms and be understood. Share her symptoms journal easily with her GP. Know in advance course of action.</p> | <p>Trust her doctor and her diagnosis. Be informed so she can trust.</p> | <p>Give back to Women to Heart and share her new knowledge and experience.</p> |
|---|--|--|--|---|---|---|--|--|--|--|



Impressed Curious Reassured → Curious Concerned → Curious Alert → Surprised Worried → Surprised Interested Reflective → Surprised Worried Empowered → Confident Challenged Supported → Confident Reflective Aware → Confident Nervous Reassured → Relieved Appreciative → Thankful Empowered Helpful

|   |  |   |   |  |   |   |  |  |  |  |
|---|--|---|---|--|---|---|--|--|--|--|
| <p>Show a video and a terms and conditions box.</p>       | <p>Show questions.</p>   | <p>Show symptoms options. Show a chatbot tool.</p>  | <p>Show statistics and display videos.</p>  | <p>Show selected symptoms. Display prompts to be filled</p>  | <p>Show report page and links</p>   |   |  | <p>Follow-up email to Alice asking how she is feeling and if she has completed the actions from recommendation report. Ask what her diagnosis is, if the Women to Heart website helped her, and if she would be willing to have her answers feed back into the database to improve the results</p> |  |  |
| <p>Run interactive clickable video. Save Alice's data</p> | <p>Fetch questions from the server. Save selected data.<br/><br/>Calculate Alice's BMI with her height and weight</p>                    | <p>Fetch symptoms options from the server. Save selected data.<br/><br/>Implement a chatbot tool</p>  | <p>Pull from database to return symptom video URL to the browser to display<br/><br/>Based on symptoms:<br/>- pull appropriate statistics from database,<br/>- customised text<br/>- change infographics to display the relative symptoms</p>   | <p>Save Alice's answers in the database<br/><br/>Create a PDF report with her answers</p>                                    |   |   |  | <p>Automatic email reminder to pushout follow-up emails one week after completing the checkup. Generate link that takes them to a customised feedback form</p>   | <p>Release the locked private data from Alice's report into the database when she opts in. Database sorts new info and adds to statistics.</p> |  |
| <p>Store in database privately</p>                        | <p>Keep risk factors list of questions updated according to new research findings<br/><br/>Program server to analyse Alice's answers</p> | <p>Keep symptoms list of questions updated according to new research findings.<br/><br/>Program server to analyse Alice's answers<br/><br/>Procure a chatbot tool</p> | <p>Keep video URL updated functional. Add new symptoms. URL to the database.<br/><br/>Keep statistics database updated. Check sites sources for updates.<br/><br/>Post video in YouTube with our site username to generate traffic<br/><br/>Collect more people's symptoms stories in video</p> | <p>Coolect and analyse prompts answers<br/><br/>Create a plan to use data to contribute to women's research heart health</p> | <p>Create "what if" scenarios for report permutations<br/><br/>Create an accurate logic tree based on data input. Partner with doctors for this task.<br/><br/>Create and update frequently journal template based on use cases</p> | <p>Monitor email actions to improve UX<br/><br/>Create and update frequently report template based on use cases<br/><br/>Make sure results page is updated with new statistics and studies about women's heart health from high authority</p> | <p>Make sure files are compatible to different devices</p> | <p>Monitor user cases and UX experience</p>  | <p>Generate feedback database to improve report accuracy</p>   |  |

Prioritise electronic documents to reduce amount of used paper

The journal improves chances of a correct diagnosis from the first time, so time and energy are saved

Improved diagnosis reduce healthcare services usage