**Predicting Heart Disease**

**Using analytics in cardiovascular preventative healthcare**

**Presentation script**

The target audience for this presentation is primary care providers who can begin to use individualized analytics with their patients to help them reduce their risk of heart disease. The literature review presents them with two methods that can be used and why this is such an important area of focus. The three key points I want them to remember are the two methods, medical history analysis and genetic analysis, and why it’s important to expand their use to overcome some of the current challenges. I want them to feel inspired and enthusiastic about beginning to use these methods to help their patients.

Hi everyone, I’m Korey Bernhardt and today I’m going to be talking about Preventing Heart Disease. Using analytics in cardiovascular preventative healthcare.

In 2020, 345,000 people died in the United States due to COVID-19. This probably isn’t shocking, or even surprising to you. COVID-19 was all over the news. Every day. All year long. It ultimately became the number three cause of death in the United States in 2020.

But we’re not here to COVID-19. Because the number one cause of death claimed twice as many lives as COVID -19. And it’s been the number one cause of death for 20 years. Not just in the United States, but in the world. And it’s a preventable disease. It’s heart disease. Heart disease causes nearly a quarter of all deaths in the United States and nearly a third of deaths globally.

Eat Right, exercise, don’t smoke. This is the common mantra to protect against heart disease. And it’s good advice. But this disease is still killing more than any other disease in the world. Isn’t there more that can be done? 690,000 people were lost to heart disease in the United States in 2020 alone. What could we do for one person?

There are two significant things that can be used to focus in on an individual’s risk for heart disease allowing for more targeted preventative measures. Medical history analysis and genetic analysis.

These both go beyond the eat right, exercise, don’t smoke mantra and target an individual’s specific risk related to heart disease. With these more individual methods, preventative measures can be taken that take that person into consideration. Taking a more individualized approach will have a bigger impact on lowering the emergence of heart disease, and ultimately lowering deaths from heart disease.

As primary care providers in the United States, one in every four of your patients may die from heart disease. Let’s help them prevent it before it even begins.

First, let’s take a look at two approaches that use medical history analysis to predict aspects of heart disease. The Framingham Risk Score and a Boston University study using Electronic Health Records.

You may be familiar with the Framingham Risk Score, or FRS. It’s been around since the study that led to it began in 1948. The FRS rates a person’s likelihood of developing heart disease in the next ten years using six factors: age, gender, cholesterol, weight, blood pressure, and smoking habits. A lot of the knowledge we have today about heart disease can trace its roots to the study that this score originated from, including pinpointing smoking as a cause of heart disease.

A Boston University study went even further. Using 200 data points from Electronic Health Records, they were able to predict hospitalizations for heart disease and diabetes up to a year in advance, with an accuracy rate of 82%.

Think about that. Using a person’s health records, this type of analysis can tell you a year in advance if one of your patients will be hospitalized for heart disease. A year in advance. That’s an awful lot of time for preventative care for that patient.

Furthermore, not only did this study have a better accuracy rate than the FRS at 82% compared to 56% for the FRS, but it actually performed better when excluding factors that the FRS includes. This shows significant capabilities for predicative models to be used to provide very individualized risk assessments. These in turn can be used to develop a preventative approach that is based on that person’s specific risk factors. And all with the person’s medical history.

But let’s get one step closer to the individual. Genetic analysis. We know genetics can play a role with some individuals that are predisposed to certain conditions. And some heart disease conditions can be hereditary. It was found several years ago that a specific chromosome is linked to an increased risk in heart attacks.

A Polygenic Risk Score or PRS can be derived using a person’s DNA. This PRS has been used successfully in multiple studies to predict the risk of heart disease, including in one study of over 10,000 French Canadians and another study of approximately 120,000 British.

No medical history needed. No gaps in records or family history. Just a swab of saliva. How beneficial would it be to have your patients known genetic predisposition for heart disease? To be able to provide a preventative care plan based on something that specific.

There are, of course, challenges to this. The cost of something this new and emerging can be prohibitive in some areas. Heart disease also affects lower income areas the most, meaning the biggest places to have an impact are those least able to afford it. And when considering PRS, this type of genetic testing is only applicable to others with similar ancestry. And as much has been focused to date on those with European ancestry, there is much more to be done to expand upon what’s been started so that it can be used more broadly.

Using analytics in cardiovascular preventative healthcare is an emerging and exciting area of research. Only with continued focus on using this type of analysis can we begin to overcome these challenges. This is where increased use In US primary care settings can be beneficial. The potential impact of uncovering the risk of heart disease before it occurs can profoundly affect the world, reducing health care costs and saving lives. I urge you all as primary care providers to bring this to your patients, so they can begin to experience the benefits of it. Let’s start trying to save each one of those 690,000 lives. One patient at a time.