

A Web-Based System For Prediction Of Coronary Heart Disease Risk Using The Framingham Algorithm

Jen-Hsiang Chuang, M.D., M.S., Rita Kukafka, Dr.P.H., Yves A. Lussier, P.Eng., M.D.,
Robert A. Jenders, M.D., M.S., James J. Cimino, M.D.

Department of Medical Informatics, Columbia University, New York, NY

Background. Although coronary heart disease (CHD) continues to be a leading cause of morbidity and mortality among adults in the U.S., it is possible to prevent CHD through modification of risk factors. The major and independent risk factors are elevated blood pressure, cigarette smoking, elevated LDL-C and cholesterol (TC), low HDL-C, diabetes mellitus, and advancing age. Primary prevention of CHD defined as risk reduction in patients without established CHD requires an assessment of risk to effectively classify patients for selection of appropriate interventions. A statistical model using the above risk factors to predict CHD risk over 10 years has been developed by the Framingham Heart Study.¹ Although score sheets were also developed to help clinicians predict patient CHD risk, they require clinicians to spend time classifying several risk scores and adding them together, introducing the possibility of error. An easier way to help patients accurately identify CHD risk themselves is needed.

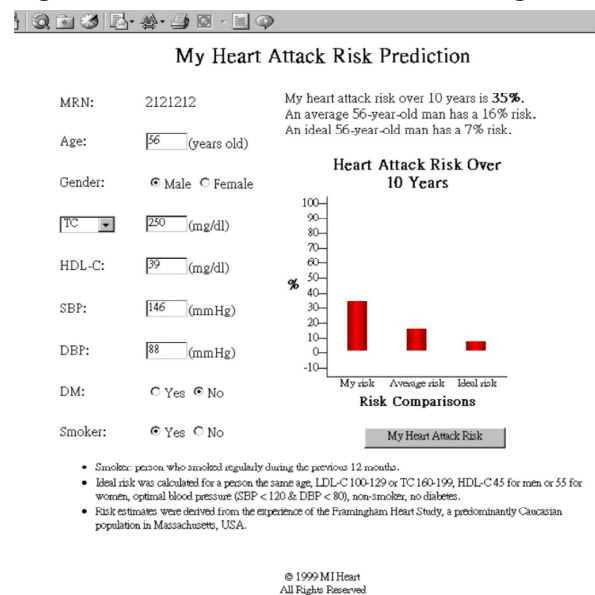
System. The Heart Attack Risk Prediction web-based system is one part of the MI-HEART clinical trial project at Columbia University.² This system was developed by using ColdFusion server to implement the Framingham algorithm and to access local database separated from the data repository at Columbia Presbyterian Medical Center. Data retrieval, risk prediction algorithm, and bar graph were implemented by CFScript and JavaScript. The patients of the intervention group enrolled in MI-HEART Project will be allowed to use this system to retrieve their own risk profile and manipulate it to find out how to lower individual risks and where to focus prevention efforts.

The first web page introduces the aim, target population (anyone whose age is 30 to 74 years old without overt coronary heart disease), and definition of predicted outcomes used by the system. When users enter into the system, they can view their stored risk profile, get their current heart attack risks over 10 years, and compare their risks with average persons and low risk persons by the bar graph and statistical data (See Fig.). Finally, users can modify their risk profile to see the effects of lowering CHD risks if they could adhere to risk-reduction interventions.

Evaluation. The evaluation of this system is still in

progress, including validation testing, integration testing, and usability testing. In the meanwhile, we found drkoop.com has developed a similar system called Heart Disease Risk Calculator.³ One advantage of our system over others is its integration with an electronic database. This helps reduce effort and error by reducing duplicate data entry.

Fig. Screen of CHD Risk Prediction Web Page.



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References

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