PROPOSAL:
Independent Study Project
University Of California, San Diego
School Of Medicine

Project Title: Preventive health education: a publicly accessible online portal for information and tools on the topic of sleep

Category: Other – Health Education for the Public

ABSTRACT

Recent updates in United States health policy and statements by numerous independent private institutions suggest a new national focus on the all-important issue of preventive health. Given the widespread use of online resources for information research, including research about personal health issues, the Internet represents a vital line of communication between the health care system and patients. Joshua Reicher previously designed a website, www.healthbutler.com, as a starting point for the communication of research-backed preventive health information and national guidelines directly to consumers or patients. However, the topic of “sleep” has not yet been addressed adequately. Sleep is a major key to a healthy lifestyle and sleep problems present a wide-variety of serious comorbidities. As a central aspect within the field of preventive health, information about sleep, and general healthy sleep habits known also as sleep hygiene, should be readily communicable directly to web users, with the goal of encouraging the following: 1) improved public understanding of the importance of sleep; 2) improved compliance with national guidelines and recommendations for sleep; and 3) enhanced communication between patients and their doctors via increased patient understanding of their own health care. The project herein proposes to develop a new “Sleep” component of the www.healthbutler.com website. This component will include concise patient-targeted information about sleep, resources for patients who wish to explore specific topics further, and web-based tools. At the project’s completion, the information and tools will be published online for general public use.

BACKGROUND

The importance of preventive health in patient care and general United States health policy has become increasingly apparent in recent years both as a potential cost-saver, and more importantly, as an avenue for increased quality of care. The topic was featured prominently in health care discussions during the 2008 Presidential race. In 2008 the United States spent more than $2.4 trillion on health care, approximately 17% of the
national GDP.\textsuperscript{1} Despite these high costs, U.S. Preventive Medicine\textsuperscript{®} estimates only around 4\% of those dollars are directed towards prevention annually.\textsuperscript{2} Recent shifts in health policy indicate that we may be headed for significant change, and in February, President Barack Obama indicated that part of his health care reform plan would include "the largest investment ever in preventive care, because that is one of the best ways to keep our people healthy and our costs under control." Among a wide variety of topics within the field of preventive health—which includes cancer screenings, immunizations, healthy diet, and exercise—is sleep. Sleep is one of the most important yet neglected aspects of preventive health, and therefore represents an ideal topic with which to pursue possibilities for increased patient compliance and overall healthier lifestyles.

Sleep plays a tremendous role in health and overall quality of life. Sleep is vitally important for feeling refreshed and rejuvenated in the morning, feeling energetic during the day, developing memory, learning, determining mood, maintaining concentration, supporting the body's immune system, and more.\textsuperscript{4} Unfortunately, many people do not get healthy or adequate sleep, with sleep-related problems affecting 50-70 million Americans.\textsuperscript{5} Sleep problems are associated with obesity, high blood pressure, diabetes, stroke, heart attack, motor vehicle accidents, work-related accidents, stress, depression, poor attention, reduced memory, and more. Sleepy drivers are responsible for over 100,000 automobile accidents per year and this leads to over 70,000 injuries and over 1,500 deaths.\textsuperscript{4} Sleep deprivation also decreases work productivity.\textsuperscript{6} For healthy individuals, maintaining proper sleep hygiene is an achievable aspect of preventive health that offers great benefits to long-term health and quality of life. For people with specific sleep disorders or other conditions disrupting sleep, the underlying problems can be evaluated and are often treatable.

Another vital component of the rising change in health care delivery is the usage of health information technology, with the internet playing the most widespread and important role. Studies in recent years have exhibited an upward trend both in general internet use and in use of the internet for searching for health-related information. In 2003, one study's more conservative estimates found that "approximately 40\% of Internet users" surveyed "used the Internet for information or advice about health or healthcare during the [previous] year."\textsuperscript{7} According to the study, US census had estimated that about 50\% of Americans were online by 2003, leaving the percentage of Americans seeking health information online at 20\%, about 55 million people.\textsuperscript{7} Most other studies estimate this value as being significantly higher. PewInternet.org claimed that in 2006, eight out of ten internet users, some 113 million Americans, searched for health information online at some time during the year.\textsuperscript{8} They found that during the average day, greater than 10 million Americans searched online for health information. The demand for health information online is vast.\textsuperscript{8} One theory asserts that people turn to the internet for health information only once symptoms of disease have surfaced, and therefore would not be interested in finding information about prevention. Yet according to Baker et al., around 90\% of people seeking health information online in 2003 were in good or excellent health.\textsuperscript{7} Another matter is what part of the US population is looking for this information. There is a weak correlation between education level and internet use for searching for health information.\textsuperscript{7} The PewInternet study also shows a very weak correlation between
education level and internet use for finding health information. Yet overall it appears that the US population is fairly well represented demographically when it comes to searching for health information online. This means that the inclusion of information specifically tailored for a wide variety of ages, races, and medical backgrounds will indeed be important and valuable. The targeted population for preventive health education is therefore not only vast, but extremely diverse.

In response to the data regarding preventive health and internet usage for acquiring health information, the author previously initiated development of a preventive health website, www.healthbutler.com. The website provides concise information exclusively in the field of preventive health, and directs this information for direct relay to patients or consumers. In addition, a number of different online preventive health tools are provided, allowing users to more actively seek to improve their preventive health measures. However, until now little effort has been directed towards the vitally important topic of sleep. This oversight represents a major cause for concern and suggests the need for investigation and focused development in the topic of sleep.

DEFINITION

What are the goals of the project?
The goal of the project is to develop a focused database of online information and tools on the topic of “Sleep” targeted toward general public use. This work will be incorporated as a segment within the previously developed website www.healthbutler.com. Steps and objectives include:

1) Designation of an area for “Sleep” topics within the preventive health information database, and composition of information pages covering this topic in more detail
2) Development of sleep-related online help tools
3) Enhancement of communication between patient and physician by increasing the patient’s knowledge of sleep and involving the patient more in his/her own care
4) Provision of recommendations to additional online resources for further needs
5) Encouragement of improved public compliance with preventive health recommendations regarding good sleep (e.g., “Sleep Hygiene”)

What is innovative about the project?
While there are innumerable online resources for information regarding general health and specific health topics, the author is unaware of current websites dedicated solely to prevention targeting consumers/patients directly, save government resources like the Centers for Disease Control and Prevention. In addition, many health information resources are inaccurate, unfocused, or difficult to navigate. This project aims to communicate preventive health information directly to patients in a focused and organized fashion, and to emphasize evidence-based recommendations with the intent of influencing behavior. Perhaps the most unique aspect of the website is its interactive capability. Users can fill out a number of questionnaires that are then processed by the website’s system, producing personalized preventive health recommendations based on the combination of user input and national preventive health recommendations. Users can
also elect to receive e-mail reminders of upcoming preventive health needs, including cancer screening and immunization due dates.

_How is the project relevant to a career in medicine?_  
As emphasis on health information technology becomes increasingly important, familiarity with online resources and comfort with patients’ physician-independent pursuit of health information will become more and more valuable. The ability of these resources to foster rather than impede the doctor-patient relationship will need to be firmly established. The importance of knowledgeable healthcare consumers in a complex system is a vital aspect of the future of health care. Lastly, the importance of the topic of sleep generally, as an aspect of preventive health, and within the public health system, represents an undervalued yet highly clinically valuable component of patient care.

_What is the student’s role in and time commitment to the project?_  
Joshua Reicher will continue to serve as the primary developer of www.healthbutler.com, and will lead the development of a new “Sleep” subdivision of the site. It is expected that the bulk of the project will be completed during the period from June to September of 2009, but with ever-changing preventive health recommendations and improved research, adjustments and changes will be necessary indefinitely.

**METHODS**

This project will consist of a number of steps:  
1) Research: topics will be researched and resources compiled for development of preventive health information on the subject of sleep  
2) Site segmentation: a segment of the website will be designated for information and tools on the subject of sleep  
3) Information: utilizing previous research and resources, concise articles will be prepared covering all vital aspects of sleep within the field of preventive health  
4) Tools: possibilities of online sleep tools will be explored and if feasible, developed  
5) User resources: links to additional resources about sleep will be provided to users

Website development in the topic of sleep will be programmatically related to the current website design of www.healthbutler.com. The website utilizes a number of different programming languages, including but not limited to PHP, HTML, Javascript, CSS, and Flash. Information is stored in a MySQL database. The site itself is based in the Open Source Content Management System Joomla!® and employs a wide variety of different plugins, components, and other Open Source tools. The website is hosted on a shared server at the domain www.healthbutler.com.

**EVALUATION**
The ISP chair and committee members will review and provide feedback on written preventive information and articles on the topic of sleep. Specifically, emphasis will be on accuracy, presentability, and clarity. The termination point will be reached when an easy-to-use, concise information database on the topic of sleep is online and presentable to the public, and when tools and/or resources are provided that offer additional utility for public use. Success will be related to 1) usability; 2) conciseness of information; 3) coverage of the topic; and 4) general utility for patients/consumers. Defined goals are accomplished when all pieces of the project described herein are up-and-running smoothly online, excluding ongoing informational changes occurring as a result of newly published research in the field of sleep.

REFERENCES