

# An Intervention to Address Secondhand Tobacco Smoke Exposure Among Nonsmokers Hospitalized With Coronary Heart Disease



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Secondhand tobacco smoke (SHS) exposure increases nonsmokers' risk of coronary heart disease and worsens outcomes after hospitalization for acute coronary syndrome, but it is rarely addressed in inpatient cardiac care. We developed and assessed a hospital-based intervention to increase nonsmokers' awareness of SHS as a cardiovascular risk factor. Nonsmokers admitted to 2 cardiac units of a large Boston, Massachusetts, hospital were surveyed before (May 2010 to January 2011) and after (November 2011 to March 2012) a system-level nurse-delivered intervention was implemented in October 2011. It consisted of a revised admission form that prompted nurses to document SHS exposure at admission, provide a pamphlet about SHS risks, and advise nonsmokers to make their home and car smoke free. The primary outcome was patients' short-term recall of advice to keep their home and car smoke free. The secondary outcome was patients' awareness of the cardiovascular risk of SHS exposure. We enrolled 190 nonsmokers before and 142 nonsmokers after implementation. Adjusting for group differences, patients admitted after the system change were more likely to recall being asked if a household member smokes (24% vs 10%, adjusted odds ratio [AOR] 3.6, 95% confidence interval [CI] 1.8 to 7.1,  $p = 0.0002$ ) and being advised to keep their home and car smoke free (28% vs 2%, AOR 27.3, 95% CI 7.8 to 95.7,  $p < 0.0001$ ). After the intervention, more patients believed that SHS exposure increased cardiovascular risk for nonsmokers (42% vs 21%, AOR 2.6, 95% CI 1.6 to 4.4) and for themselves (39% vs 22%, AOR 2.2, 95% CI 1.3 to 3.8). In conclusion, a system-level intervention in cardiac units successfully increased hospitalized nonsmokers' awareness of the cardiovascular risk of SHS exposure. © 2014 Elsevier Inc. All rights reserved. (Am J Cardiol 2014;114:1040–1045)

Secondhand tobacco smoke (SHS) exposure increases nonsmokers' coronary heart disease (CHD) risk by 25% to 30%.<sup>1,2</sup> Among nonsmokers hospitalized with acute coronary syndrome, higher levels of SHS exposure at admission are associated with higher 30-day postdischarge morbidity, mortality, and hospital readmission rates.<sup>3,4</sup> Health care professionals are well positioned to inform hospitalized nonsmokers about avoiding the risk of SHS exposure but rarely do so. We developed an intervention to inform adult nonsmokers hospitalized with CHD about the risk of SHS exposure and assessed its effect on patients' awareness of and attitudes about the health effects of SHS. The intervention aimed to increase hospital nurses' delivery of brief

advice to patients to adopt a smoke-free policy for their home and car. We chose this message because US homes and cars are now the major sources of adult nonsmokers' SHS exposure.<sup>1</sup> Laws and regulations have reduced SHS exposure in many public places, workplaces, restaurants, and bars, but even if these were adopted nationwide, they will not be sufficient to reduce SHS exposure in homes and cars.<sup>5</sup> Reducing SHS exposure will also require persuading individuals to voluntarily adopt smoke-free policies for their homes and cars.

## Methods

The study was conducted at Massachusetts General Hospital, a 900-bed hospital in Boston, Massachusetts. A pre-post study design assessed the effectiveness of an intervention in 2 inpatient cardiac units with a total of 72 beds. Research staff interviewed nonsmokers admitted to the participating units before (May 26, 2010, to January 27, 2011) and after (November 8, 2011, to March 18, 2012) the intervention was implemented on October 19, 2011. The Institutional Review Board of Massachusetts General Hospital/Partners HealthCare approved the study.

The intervention was a system-level change in nurses' workflow for admitting patients. Standard nursing practice at Massachusetts General Hospital requires completion of a

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See page 1045 for disclosure information.

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Side A



Side B

<p><b>A Smoke Free Home and Car Matter if you have Heart Disease</b></p> <ul style="list-style-type: none"> <li>Breathing in someone else’s cigarette smoke can cause - and worsen – heart disease in a nonsmoker.</li> <li>Breathing in even a little smoke raises your chance of having a heart attack.</li> <li>Home and car are the main places where nonsmokers contact cigarette smoke.</li> <li>The only safe amount of secondhand smoke is NONE.</li> </ul>	<p><b>How to Protect Yourself</b></p> <ul style="list-style-type: none"> <li>Make a firm rule that no one smokes in your home or car – ever!</li> <li>Put up this sign to let everyone know.</li> <li>Ask people around you not to smoke for the sake of your heart.</li> <li>Stay away from places where smoking is allowed.</li> </ul>	<p><b>An Important Message for The Smokers in Your Life</b></p> <ul style="list-style-type: none"> <li>Protect your family             <ul style="list-style-type: none"> <li>Make your home and car smoke- free.</li> <li>Try to stop smoking to help you and your loved ones. For help:                 <ul style="list-style-type: none"> <li>Call 1-800-QUIT-NOW (Free Smokers Quitline)</li> <li>Go to <a href="http://Becomeanex.org">Becomeanex.org</a></li> </ul> </li> </ul> </li> </ul>
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Figure 1. Smoke-free home pamphlet.

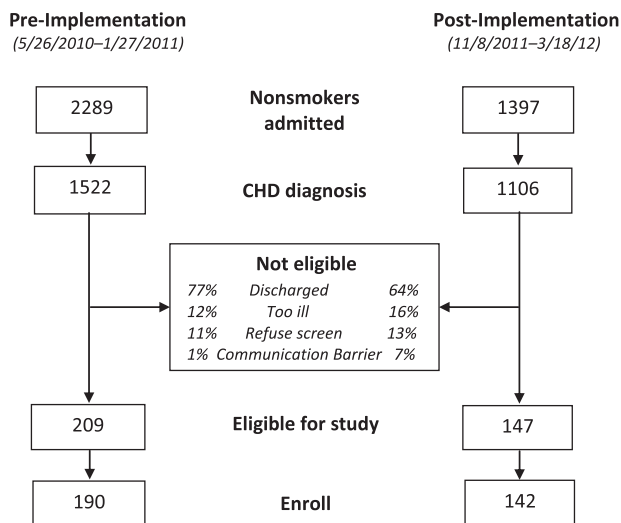


Figure 2. Study flow diagram.

disease and advised patients to protect themselves by adopting smoke-free rules for home and car (Figure 1). Before the start of the intervention, nursing leaders notified all staff about the program by e-mail, and research staff introduced it at an educational session in each unit. A monthly meeting with nurses on each unit provided feedback about the unit’s performance.

To assess the implementation of the intervention, research staff conducted bedside interviews with nonsmokers admitted to the participating units with a diagnosis of CHD. This occurred on average on days 2 to 3 of the hospital stay. Patients were ineligible if they were aged <18 years, did not speak English, had used tobacco or nicotine replacement in the past 30 days, had no chart-documented CHD diagnosis, or were deemed by their nurse to be medically or cognitively inappropriate for a bedside assessment. Study staff screened records of patients newly admitted to the participating units to identify potentially eligible patients. The patient’s nurse approached each potentially eligible patient to request permission for research staff to visit. Study staff confirmed eligibility, obtained oral informed consent, and conducted a 10-minute assessment at the patient’s bedside.

The primary outcome measure was a patient’s report of having received advice to adopt a smoke-free policy for the home or car (“Since your admission to the hospital has a doctor, nurse, or other health professional advised you to keep your home or car smoke-free?”). Secondary outcome measures included a patient’s report of being asked in the hospital about potential SHS exposure (“Since your admission to the hospital has a doctor, nurse or other health professional asked you if you are exposed to other people’s tobacco smoke?”).

nursing admission data set for every new patient within 24 hours of admission. The intervention added to this data set (1) a question assessing patients’ SHS exposure (“Does anyone ever smoke in your home or car?”), (2) a statement of advice to be read to all patients (“In order to keep your heart healthy, you need to keep your home and car smoke free”), and (3) a prompt reminding nurses to distribute a pamphlet about SHS exposure (“Give the patient the smoke-free home pamphlet.”). We created a pamphlet that described the risk of SHS exposure to patients with cardiac

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