

Image GentlySM: A National Education and Communication Campaign in Radiology Using the Science of Social Marketing

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Communication campaigns are an accepted method for altering societal attitudes, increasing knowledge, and achieving social and behavioral change particularly within public health and the social sciences. The Image GentlySM campaign is a national education and awareness campaign in radiology designed to promote the need for and opportunities to decrease radiation to children when CT scans are indicated. In this article, the relatively new science of social marketing is reviewed and the theoretical basis for an effective communication campaign in radiology is discussed. Communication strategies are considered and the type of outcomes that should be measured are reviewed. This methodology has demonstrated that simple, straightforward safety messages on radiation protection targeted to medical professionals throughout the radiology community, utilizing multiple media, can affect awareness potentially leading to change in practice.

Key Words: Social marketing, public campaigns, mass media, radiation protection, children

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“Effective communication is essential to the practice of high quality medicine.”

—Kurtz et al [1]

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Communication skills in medicine are typically considered in the context of the doctor-patient relationship. However, it is critical that medical organizations and specialties communicate effectively with their constituents to effect change for the public good. This may take the form of mass media campaigns, which are increasingly used to help prevent or manage various health conditions. These campaigns use public media and commercial marketing techniques to promote “behavior changes that will improve the health of the population” [2]. Such campaigns are also called media interventions or campaigns, public education campaigns, or social marketing [2]. These campaigns within the health community may be targeted to the public, to health professionals, or to both, and they may use a range of media, including print (scientific journals, trade publications, the lay press), the Internet (e-mail, blogs, list servers, podcasts, Web sites), radio, television, or posters. The underlying premise of these campaigns is to use mar-

keting principles to “influence a target audience to voluntarily . . . modify a behavior for the benefit of individuals, groups, or society as a whole” [3]. Examples of health-related behaviors that have been extensively studied within radiology include 1) the promotion of screening mammography among women and health care providers [4]; 2) changes in physician behavior associated with organizational recommendations on the use of routine chest x-rays [5]; and 3) attitudes and imaging practice related to low back pain [6]. In this article, we review the science of social marketing, the theories that form the framework for this science, and the communication strategies and measurable outcomes that are linked to success. The Image GentlySM campaign used this model and illustrates the principles of social marketing.

SOCIAL MARKETING

Social marketing is a relatively new field that first gained ground during the late 1960s, when the Vietnam War caused many citizens in the United States to reevaluate their roles within society. Early attempts at social marketing in the health field involved such simple interventions as the promotion of condom use for family planning. In the 1980s, the notion that social marketing could be more than a public relations campaign began to emerge. In the 1990s, many scholars in the field came to recognize that social marketing was not as much about changing attitudes as influencing behavior [7]. This led to the newer definition of social marketing by Andreasen [7]:

Social marketing is the application of commercial marketing technologies to the analysis, planning, execution, and evaluation of programs designed to influence the voluntary behavior of a target audience in order to improve their personal welfare and that of the society of which they are a part.

This focus on the behavioral influence led to the creation of various theoretical frameworks and testable programs to evaluate these interventions. Interestingly, the author of this definition of social marketing differentiated education (information alone will achieve the desired end) and the law (needed when consumers are extremely reluctant to act, such as drunk-driving laws) as specific interventions, separate from social marketing.

More recently, social marketing has expanded its influence with the introduction of social marketing in general textbooks, a dedicated journal, the creation of a social marketing institute, and its inclusion as a subspecialty within advertising companies and in summaries of “best practices” in the scholarly literature. Many US federal agencies, including the Centers for Disease Control and Prevention, as well as a significant number of non-



Fig 1. The Image gently logo is a recognizable symbol of the campaign. The child’s hand and butterfly reinforce the message of the campaign in a simple but strong visual.

profit organizations, such as the United Nations, have used social marketing tools [7].

Theoretical Elements of a Social Marketing Campaign

When a social marketing campaign is considered, several questions need to be asked when considering the approach. These include the following [8]: What is the primary goal of the intervention? Who is the target population? What are the messages for the intervention? In 2000, Fishbein and Yzer [8] created an integrated theoretical model for changing health behaviors. According to the model, any given behavior is most likely to occur if one has a strong intention to perform the behavior, if a person has the necessary skills and abilities required to perform the behavior, and if there are no environmental constraints preventing behavioral performance.

If all of these conditions are met, this integrated theory notes that “there is a high probability that the behavior will be performed” [8]. This model incorporates an earlier behavioral model that requires 3 things of the participants: 1) their attitudes toward performing the behavior, which are based on their beliefs about the positive and negative consequences (ie, costs and benefits) of performing that behavior; 2) perceived norms (ie, others in the community are performing the behavior); and 3) self-efficacy, which involves participants’ perceptions that they can perform the behavior under a variety of challenging circumstances [8]. Thus, in the Image Gently campaign, the theoretical assumptions are that physicians, radiology technologists, and medical physicists wish to decrease radiation dose to their pediatric patients, that this is being done at centers that have developed size-based imaging parameters for computed tomographic (CT) scans in children, and that this awareness will empower all in the imaging community to do the same (Figure 1).

Applying the Model

It is most important in social marketing to follow a systematic process [9]. The first tenet of the integrated theoretical model is identifying the primary goal of the social marketing campaign. In the Image Gently campaign, the primary goal of the intervention is "to increase CT radiation dose awareness to ensure that only indicated exams are performed and at the lowest appropriate dose" [10].

The next important consideration is to identify the target population for the campaign. The campaign has planned a 3-phase approach. For the first phase of the Image Gently campaign, a target audience of imaging professionals, including radiologists, radiologic technologists, and medical physicists was selected [9]. The second phase, which is already in progress, targets referring physicians, such as pediatricians, emergency room physicians, surgeons, and oncologists. The third phase will target parents and the public.

Part of the strategy of social marketing is creating partnerships to increase the likelihood of success [9]. The Alliance for Radiation Safety in Pediatric Imaging is a consortium of 30 health care organizations and agencies representing more than 500,000 health care professionals who have agreed to pool resources to relay the message to their members to optimize the chances for success. When considering the context of performance of a CT scan in a child, the critical individuals involved in determining its indication and directing its performance include the medical physicists (who possess the expertise to optimize low-dose performance of preexisting CT equipment), radiologists (who understand the diagnostic capabilities of the modality, determine the scan protocols, and individualize these protocols on the basis of specific patient care indications), and radiology technologists (who perform the scans and are the critical link between patients and radiologists). The Alliance for Radiation Safety in Pediatric Imaging determined that a team approach targeting these individuals would be most effective as the initial marketing wave, to optimize chances for the implementation of the desired changes in behavior.

The cost of a campaign in social marketing differs from a mass media or advertising campaign in that often, the money is obtained from funds provided by foundations, government grants, donations, the selling of a tangible product associated with the campaign, or a grant from a corporate sponsor [9]. While the first phase of the campaign has been supported by an unrestricted education grant from GE Healthcare that paid for printing costs associated with the poster and distribution costs, in the near term, the campaign hopes to obtain funding from foundations related to child health. While the cost of this far-reaching campaign has been less than \$30,000

to date, this success has been due in large part to the donation of time and services from the alliance's founding member organizations and to the use of preexisting communication networks within the 30 societies.

The method of distributing the campaign message is listed here. To date, in addition to the Web site, 3 scientific publications [10-12] have highlighted the campaign; more than 15 articles in the trade press have been published; 4 of the major radiology trade news outlets have published (either in print or online) public service announcements; a poster calendar was mailed with two scientific journals and the internal member publications of 3 of the alliance's member organizations (the ACR, the American Roentgen Ray Society, and the American Society of Radiologic Technologists) and given out at the American Osteopathic College of Radiology meeting, reaching approximately 200,000 imaging providers; and blast e-mails to more than 400,000 health care providers through the 30 alliance organizations (Table 1) have been sent. Numerous health care blogs have discussed the campaign. Three separate articles regarding the roles of radiologists, medical physicists, and radiologic technologists were published in the member publications of at least 4 of the alliance's member organizations (again reaching 200,000 imaging providers). The campaign has been mentioned at a variety of scientific discussions, including the Neuhauser lecture at the annual meeting of the Society for Pediatric Radiology (SPR). A resolution was recently introduced in the US House of Representatives (House Resolution 1216) in support of the campaign's goals.

The next important consideration in the social marketing campaign is to determine a simple message for the intervention process. Fishbein and Yzer [8] emphasized the need to distinguish between the behavior and the goal. The most effective interventions have been found to be those that focus on specific behaviors (eat vegetables 5 times per week) rather than behavioral categories (eat healthy foods). With this in mind, the message for the campaign was created. The message is positive and provides a rationale for the need for a change in behavior, listing 3 simple changes that can decrease radiation dose to children undergoing CT scans. The message is:

There's no question: CT helps us save kids' lives!

But, when we image, radiation matters!

Children are more sensitive to radiation

What we do now lasts their lifetimes.

So, when we image, let's image gently:

More is often not better.

When CT is the right thing to do:

Child size the kVp and mA

One scan (single phase) is often enough

Scan only the indicated area

Table 1. Member organizations of the Alliance for Radiation Safety in Pediatric Imaging

Founding Organizations

- The Society for Pediatric Radiology
- American Association of Physicists in Medicine
- American College of Radiology
- American Society of Radiologic Technologists

Alliance Organizations:

- Academy of Radiology Research
- American Academy of Pediatrics
- American Institute of Ultrasound in Medicine
- American Osteopathic College of Radiology
- American Registry of Radiologic Technologists
- American Roentgen Ray Society
- American Society of Emergency Radiology
- American Society of Pediatric Neuroradiology
- Asian-Oceanic Society for Paediatric Radiology
- Association of University Radiologists
- Canadian Association of Radiologists
- Coalition for Imaging and Bioengineering Research
- Conference of Radiation Control Program Directors
- National Council on Radiation Protection and Measurements
- North American Society for Cardiovascular Imaging
- Radiological Society of North America
- The Royal Australian and New Zealand College of Radiologists
- Society of Interventional Radiology
- Sociedad Latino Americana de Radiologia Pediátrica
- Society for Pediatric Interventional Radiology
- Society of Computed Body Tomography and Magnetic Resonance
- Society of Gastrointestinal Radiologists
- The Society of Nuclear Medicine
- The Society of Nuclear Medicine - Technologist Section
- Society of Radiologists in Ultrasound
- Society of Uroradiology

Creating the Community

Interestingly, when media alone have been tried as an intervention designed to alter behavior, there has been little impact. Research on public health campaigns demonstrate that when the media have been used in combination with the creation of a “community” component, significant changes in behavior have been reported [13]. Examples of unsuccessful campaigns include a well-controlled study on promoting seatbelt use within two towns, one of which acted as a control. After extensive

promotion of seatbelt use with only a professionally prepared media message, the study demonstrated little sustained seatbelt use in the town where no community support had been generated. This is in contrast to the results of a Stanford study in which a campaign to decrease smoking included the use of media as well as intensive community interventions. This study, incorporating community intervention, showed a decrease in smoking prevalence compared with the control town [13].

In the Image Gently campaign, community interventions were attempted in several ways. First, the target population for the message included the “team” of health care professionals involved with the performance of CT scans in children, radiologists, technologists, and medical physicists. It was the belief of the campaign steering committee that all members of the radiologic health care team should receive the same message at the same time for the campaign to succeed. Creating a similar professional “norm” through repetition of the same message to all members of the team using blast e-mails and links on the Web sites of the professional societies’ (such as the SPR, the ACR, the American Association of Physicists in Medicine, and the American Society of Radiologic Technologists) was fundamental in this community approach. Thus, the importance of communication among technologists, radiologists, and medical physicists in effectively lowering dose was addressed through a uniform message from their respective professional societies. In addition, within each subgroup of the targeted health care team (ie, radiologists, technologists, and medical physicists), several behaviors were suggested to promote “buy-in” to the Image Gently campaign. The Web site’s homepage (<http://www.imagegently.org>) has a link to a personal “pledge button” so that individual radiologists, technologists, and physicists can pledge to “image gently.” A separate logo for those who sign up (which can be downloaded for their use) has been made available, and occasional updates regarding the campaign can be voluntarily requested by this group of “pledgers.” To date, more than 1,400 individuals have taken the pledge to image gently in their practice. The act of signing up suggests that these pledgers believe in the primary message of the campaign and have a “strong intention” to perform the behaviors as listed in the simple message. Additionally, the Image Gently Web site and the SPR’s Web site have a comprehensive PowerPoint (Microsoft Corporation, Redmond, Washington) presentation with more than 140 slides covering the why and how of lowering radiation dose in children (created by Drs Thomas Slovis, Donald Frush, and Sue Kaste); this presentation has been downloaded 1062 times from the Image Gently SPR sites, suggesting that these slides are being used for

discussions in local communities about the issues of radiation protection for children.

An additional component of creating a successful campaign is to ensure that the stakeholders or team members have the necessary skills to perform the behavior. To enable this component, medical physicists were involved through the American Association of Physicists in Medicine. Keith Strauss, MS, and Donald Frush, MD, two of the leaders in this campaign, developed and tested “universal protocols” that can be downloaded from the Web site (along with a practical worksheet) to give physicists the tools to implement lower dose protocols locally for CT scans in children. Once these protocols are reviewed and approved by radiologists, CT technologists have the ability to apply the newer protocols, affecting the desired goal of CT scans with lower radiation dose in children. In addition, the American Society of Radiologic Technologists has created online educational tools to enhance the knowledge and skills of CT technologists in radiation safety for children. The campaign has sought to create a positive message for all members of the health care team to remove any impediments in enabling a restructuring of CT protocols for children in individual hospitals or practices. Materials on the Image Gently Web site are designed to inform members of the radiologic health care team of the need to consider the cost/benefit ratio of performing CT scans in children, a basic tenet of risk analysis, and to enable buy-in and success in altering health care behaviors [8]. This message has been repeatedly reinforced by the alliance’s member societies by referencing the campaign in as many publications, public forums, and promotions of best practices as possible. The campaign has sought to create a “sense of urgency” to be part of the larger good that comes from encouraging radiation protection for children in imaging.

Evaluating the Effectiveness of a Social Marketing Campaign

Mass media or social marketing campaigns have been notoriously difficult to evaluate in their effectiveness, because it is often challenging and sometimes not possible to establish a randomized control group in the initial design [13]. Obtaining a collection of baseline data is also difficult. In one review of 24 social marketing studies, 9 of the 24 did not collect baseline data [13]. Another review that assessed the methodology in evaluating the effectiveness of communication campaigns found that the methodology is complex and multifaceted. For example, are intermediate-term or long-term outcomes to be documented? Moreover, it may be difficult to extricate the effects of extraneous influences from other sources on a campaign [2]. In a systematic review of the effects of back pain mass media campaigns, Woby et al [14] concluded that although the results were difficult to inter-

pret, “we already have strong observational evidence that beliefs predict outcome.” Another well-designed study explored the impact of a celebrity promotional campaign on the use of colon cancer screening (the “Katie Couric effect”). This study concluded that a weeklong colorectal cancer awareness campaign coupled with the television anchor’s on-air colonoscopy did result in a temporary increase in colonoscopy and that a “celebrity spokesperson can have a substantial impact on public participation in preventive care” [15]. The study was a population-based observational study conducted using 2 different data sources: 2 large voluntary consortia that performed more than 95,000 colonoscopies during the study period.

In radiology, evaluating the true effectiveness of a social marketing campaign such as Image Gently may require large central databases, such as those being established by the ACR. In pediatric radiology, Michael E. Arch, MD, and Dr Frush have recently submitted a paper with data from a follow-up survey of scan parameters used by pediatric radiologists in North America. It is encouraging to note that in this specialized group, their survey results showed that since 2001, there has been a significant decrease in kVp and mA, 2 principal determinants of radiation dose, in part due to efforts to increase awareness of the risks of radiation [16].

The Image Gently campaign sought to obtain baseline self-reported adherence to the simple message of the campaign by asking 4 questions regarding change of practice of those who have taken the pledge to image gently. We hope to access those data pending institutional review board approval and voluntary and anonymous participation in the process. As we await the results of those data, to date, the Web site has had more than 40,000 visits, the CT protocols have been viewed more than 4,000 times, and the protocols worksheet has been downloaded almost 1,000 times. If even 10% of those who view the CT protocol worksheet call their medical physicists to change their protocols, communicate within their radiology groups to “child-size” the scans for children, and work with CT technologists to change practice, that will represent a substantial beginning. Several personal communications, including one from a 40-site CT practice that wishes to “get on board,” are encouraging and suggest that the activity on the Web site translates into action in the radiology workplace.

CONCLUSION

The Image Gently campaign is an education and awareness campaign sponsored by a group of 19 health professional organizations and agencies that used emerging social marketing theory to create a simple message to a targeted audience with the goal of changing behavior in

the radiology workplace. The desired behavioral change was reinforced through multiple media and delivered in a variety of positive messages. Although the methodology of quantifying its effectiveness is complex, early indicators suggest that radiology practices are reviewing their scan protocols for children and potentially decreasing radiation risk in their daily practice. This is the measure of success in this particular marketing campaign.

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