Introduction

Colorectal cancer is an important cause of morbidity and mortality throughout the developed and industrializing/westernizing world [1]. Etiological causes include the ‘Western’ or industrialized world lifestyle, innate genetic susceptibility and the interaction between the two. The biological progress to clinical cancer is stepwise, over a period of time. This gives us a ‘window of opportunity’ to identify and treat the pre-cancerous adenomatous polyps or early-stage cancer, before it is beyond medical treatment (Figure 1). Strong evidence now indicates that screening for colorectal cancer can decrease colorectal cancer incidence and mortality [2, 3]. Many countries are now considering, or pilot testing, organized programs of colorectal cancer screening [4]. Others have begun opportunistic screening [5].

Implementation of colorectal cancer screening on a broad scale requires a substantial amount of initial planning and resource allocation, including defining roles for different health professionals, identifying barriers to implementation, and providing education, training and tools to facilitate success.

The workgroup consisted of 12 members from nine countries and included primary care physicians, gastroenterologists, surgeons, oncologists, health policy makers and cancer advocates, and reports its findings as follows.

Health professionals’ roles in implementing screening

Educating and training in colorectal cancer screening

This needs to be directed at several different groups including: primary care physicians, general surgeons, oncologists, gastroenterologists and other endoscopists; paramedical staff including nurses and clerical staff; policy makers; advocacy groups; and political leaders (Table 1).

Primary care providers. The key roles for primary care providers (and including general surgeons, oncologists and gynaecologists who often are referred to for advice or are in a position to volunteer it) include: informing patients about colorectal cancer, the benefits of screening and the tests available and encouraging them to have screening; identifying high-risk patients who need special screening; integrating colorectal cancer screening with other preventive and curative care activities; and, in some cases, performing screening, keeping records of results, and assuring that follow-up tests are ordered and completed. Primary care providers should also advocate for screening with policy makers and politicians [6].

Gastroenterologists and gastrointestinal surgeons. Gastrointestinal specialists also have several key roles in colorectal cancer screening. They perform screening examinations and are responsible for maintaining reports of the results and ensuring that patients receive the proper follow-up care after screening examinations. Along with primary care physicians, they are responsible for recognizing high-risk patients and providing appropriate testing. They should act as advocates for screening and may also educate primary care physicians about screening [7].

Paramedical staff. These include the nurses and administrative staff who work with the physician promoting and/or performing screening. Nurses educate patients about the screening procedures and are often responsible for maintaining a safe, supportive and effective screening environment. In many cases, the paramedical staff also play a major role in maintaining screening databases and integrating screening with other clinical activities.

Advocacy organizations, policy makers and political leaders. These also have key roles in colorectal cancer screening. Each of these groups has responsibility for advocating for sufficient resources to be available so as to conduct screening effectively and efficiently. To do so, they must assure that insurance
coverage is available for high-risk patients and balance average-risk colorectal cancer screening costs with other health and health-care needs. They must also work with health-care provider organizations to assure that high-quality care is available; this may require developing regulations or standards for screening and follow-up tests and therapy.

In many countries, promotion of cancer prevention and sometimes performance of screening is done by a national antican-cer society. The responsible laypersons should be actively enrolled into colon cancer screening projects and therefore need to be fully aware of screening methodologies and results of their performance.

Barriers to effective screening and overcoming them

Well-structured health systems must understand barriers to effective screening and develop strategies for overcoming them. Barriers to effective screening can be classified as those of the patient, provider or health-care system.

Patient barriers

Patient barriers (Table 2) include: a lack of knowledge or awareness about colorectal cancer or the availability of screening tests; embarrassment about screening or fear of screening with a negative attitude based on previous unpleasant experience (such as rigid sigmoidoscopy); cost of screening and/or lack of medical coverage for its performance; competing health and other demands, and the beliefs that ‘I feel fine so I don’t need a test’ or a fatalistic attitude ‘I don’t want to know if I have cancer since there is nothing I can do about it’.

Provider barriers

Provider barriers (Table 3) include: an inadequate or incorrect knowledge about the benefit and performance of screening; a lack of training or experience in performing or discussing screening; the belief that patients do not want or will not accept screening; forgetting to offer screening and follow-up tests; competing demands during the office visit which often include acute medical problems and other preventive examinations or demands; and the perception that reimbursement for screening is inadequate [6–10].

Health-care system barriers

Health-care system barriers (Table 4) include: a lack of knowledge about and performance of non-endoscopic screening using fecal occult blood testing (FOBT); a lack of easily available trained endoscopists and equipment for endoscopy; lack of health medical organization or national screening policy guidelines; unavailability of reminder and other data

Table 1. Professional education and advocacy of CRC screening

| Health professionals play a range of key roles in ensuring the success of a CRC screening program |
| Health education on the importance and methodology of CRC screening should also be provided to advocacy groups and policy-makers |

CRC, colorectal cancer.

Table 2. Patient barriers to CRC screening

| Lack of knowledge and understanding of CRC and screening |
| Absence of ‘screening orientation’ |
| Cancer fatalism |
| Embarrassment (FOBT, endoscopy) |
| Fear, previous bad experience with endoscopy |
| Cost of screening and lack of medical coverage |
| Inconvenience, loss of work time |

CRC, colorectal cancer; FOBT, fecal occult blood testing.

Table 3. Provider barriers to CRC screening

| Inadequate knowledge and understanding of CRC and screening |
| Lack of experience and training in CRC screening |
| Forgetting to recommend CRC screening |
| Belief that patients do not want CRC screening |
| Competing tasks, especially for the primary care physician |
| Low and/or inadequate reimbursement for performing CRC screening |

Table 4. System barriers to CRC screening

| Lack of economic and political incentives for insurers and health systems to promote preventive medicine |
| Lack of national CRC screening guidelines |
| Lack of reminder systems for screening performance, follow-up and recall |
| Lack of trained endoscopy personnel and equipment |
| Low and/or inadequate reimbursement for performing CRC screening |

CRC, colorectal cancer.
management systems; poor reimbursement for preventive medicine; and lack of economic or political incentives for insurers and governments to adopt screening [6].

**Specific recommendations for promoting screening implementation**

**Develop and disseminate structured educational programs for members of the public, providers, health-care systems and policy makers/political leaders**

Effective educational programs should be directed to each of the important actors.

For members of the public, educational efforts should focus on awareness of colorectal cancer as an important health issue and the availability of effective screening methods. Members of the public should be encouraged to discuss screening with their health-care providers. Screening programs for persons without regular health-care providers may also be effective. For persons considering screening, materials should provide information on the potential benefits and adverse effects, how to prepare for screening and what constitutes appropriate follow-up care. The US Centers for Disease Control ‘Screen for Life’ campaign materials (available at www.cdc.gov), are a good example in this area. Prominent public personalities can promote screening and act as role models. For example, Pope John Paul II and Senator Hillary Rodham Clinton have agreed to be, respectively, Patron and Supporter of the International Digestive Cancer Alliance for the Worldwide Promotion of Prevention and Screening of Digestive Cancers.

Provider education should focus on skill building and overcoming barriers to successful screening. Some of the key features of educational programs are described in Table 1. An example of provider educational materials is the US Centers for Disease Control and Prevention’s ‘A Call to Action Prevention and Early Detection of Colorectal Cancer’ slide set, available at www.cdc.gov. Other such educational materials have been prepared in various national languages and should be easily available and updated [4]. For endoscopists and clinicians, colorectal screening educational materials are now being prepared in detail for an OMED/OMGE (World Organizations of Gastroenterology and Gastrointestinal Endoscopy) website (www.gastro-pro.org).

Health-care system administrators, policy makers and politicians should receive information about the large potential benefits and favorable cost-effectiveness of colorectal cancer screening [11, 12].

**Develop evidence-based standards for quality throughout the screening process**

Quality standards should assure accurate preparation and development of FOBT, whether office-developed slides or central laboratory-developed tests are used [13] (Table 5). Accurate, safe, painless, rapid and affordable endoscopic screening should be available [14, 15]. Attaining quality requires structured training with ongoing updates and reinforcement, periodic assessment of competence and outcome audits [9] (Tables 6 and 7). Videotapes on the commonly used guaiac FOBT preparation and development are available, and are also on www.gastro-pro.org [7]. Several endoscopy centers have developed and implemented systematic approaches to training and quality assurance, including the use of simulators for teaching [8–10, 16] (see also www.simbionix.com).

**Table 5. Fecal occult blood testing (FOBT) and other screening tests for CRC**

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<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
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<tbody>
<tr>
<td>Physician and patient education about benefits and limitations of FOBT screening</td>
<td>Patient preparation of FOBT</td>
</tr>
<tr>
<td>Physician and patient education about significance of test results</td>
<td>Quality control&lt;br&gt;Accurate and standardized development of FOBT, recommend central laboratory development&lt;br&gt;Assurance of appropriate follow-up&lt;br&gt;Assurance of ongoing follow-up&lt;br&gt;Cost issues of a FOBT screening program&lt;br&gt;Promote development of highly sensitive and specific non-endoscopic screening tests</td>
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**Table 6. Endoscopic screening: sigmoidoscopy and colonoscopy**

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<th>Requirement</th>
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<tr>
<td>Physician and patient education about the benefits and limitations of endoscopic CRC screening</td>
<td>Patient instructions on preparation for endoscopy&lt;br&gt;Goal is accurate, painless, safe, rapid, and affordable testing&lt;br&gt;Organized training for all endoscopists&lt;br&gt;Periodic assessment of competency and quality in endoscopy</td>
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**Table 7. Endoscopic screening sigmoidoscopy and colonoscopy**

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<th>Requirement</th>
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<tr>
<td>Ongoing training&lt;br&gt;Endoscopy unit audits of quality control&lt;br&gt;Accreditation of unit and endoscopists as meeting quality standards&lt;br&gt;Physician and patient education about significance of test results&lt;br&gt;Assurance of appropriate follow-up&lt;br&gt;Cost issues of screening endoscopy</td>
<td>reinforces, periodic assessment of competence and outcome audits [9] (Tables 6 and 7). Videotapes on the commonly used guaiac FOBT preparation and development are available, and are also on <a href="http://www.gastro-pro.org">www.gastro-pro.org</a> [7]. Several endoscopy centers have developed and implemented systematic approaches to training and quality assurance, including the use of simulators for teaching [8–10, 16] (see also <a href="http://www.simbionix.com">www.simbionix.com</a>).</td>
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**Develop and disseminate inexpensive, easy to use, data management systems**

Data management systems should include the ability to record and update patient risk and demographic data, test ordered, their completion, results and follow-up examinations, and should be able to provide reminders when the next test is due [6]. Ideally, such systems would provide information to providers and also be accessible to the patient, especially as they may move to another medical service or provider. Mainten ance of data privacy is essential so as to prevent untoward use of this information.
Advocate screening

Advocacy should be addressed by meetings and personal interaction with policy leaders and policy makers, so as to promote colorectal cancer screening in the preventive health policy and to provide adequate resources for its performance. Some nations may wish to develop a specific national screening policy that advocates use of one or more effective screening tests; others may wish to present a wider range of options that can be tailored to specific circumstances. However, it is important not to confuse the target audience with conflicting and/or too many alternative recommendations.

Promote colorectal cancer screening as part of comprehensive clinical preventive care

Preventive health visits are associated with higher rates of colorectal cancer screening. This includes screening for common disorders; physical examination, blood pressure, breast/gynecological and prostate examination; urine, blood sugar and lipids; mammography and colorectal cancer screening (for example, health care provided at some places of work [12]).

Currently, only about 20% of patients in the USA have a preventive care visit in each year. Increasing this rate could provide additional opportunities for screening.

Summary of key issues

In order to perform screening effectively, countries planning to implement colorectal cancer screening need to:

(i) identify roles for different types of health-care professionals;
(ii) develop tools for overcoming barriers to effective colorectal screening;
(iii) ensure that screening is adequately reimbursed so that the costs of the program are not prohibitive and that providers of screening do not have economic disincentives that would discourage screening;
(iv) develop comprehensive quality assurance programs for individuals and centers engaged in colorectal cancer screening;
(v) make available data management and follow-up systems that are feasible for use in primary care practice and endoscopy centers; and
(vi) provide training opportunities to health professionals and advocates to ensure that they have adequate knowledge and skills for screening and its promotion.

Acknowledgements


References