Colorectal cancer (CRC), or bowel cancer, is a significant health problem in many western countries, including Australia. While the underlying causes are still unclear, there is now good evidence that screening is effective in reducing deaths from CRC, by facilitating the detection and removal of curable cancers. However, there are many issues still to be resolved before screening can be implemented in the most effective and appropriate way in the Australian setting.

There is no simple answer to the question ‘How should colorectal cancer screening be implemented?’ This is because there are different ways of reaching the target population and different types of screening tests, each with their own particular advantages or disadvantages. Within the target population, there are sub-groups with different levels of risk who ideally require different approaches to screening. The uncertainties and complexities of how to implement CRC screening in Australia can be illustrated by briefly describing some initiatives and studies being undertaken by a group affiliated with Flinders University, Adelaide University and CSIRO. Over the last 5 years this group, based at Flinders Medical Centre (FMC) and the Repatriation General Hospital (RGH), Daw Park, and operating as the Bowel Health Service, has been undertaking research into screening for CRC. More recently, the group has been expanded to include behavioural scientists from Adelaide University and CSIRO.

Options for CRC screening.

There is evidence to support the use of colonoscopy, flexible sigmoidoscopy and faecal occult blood testing (FOBT) as possible population screening modalities. Other methods of detecting colonic lesions include radiological methods (barium enema or virtual colonoscopy /CT colonography), digital rectal examination, and DNA based faecal tests. These methods are either unsuitable as screening modalities or have not yet been proven as effective in a population screening setting.

Colonoscopy is regarded as the most sensitive test, but cost, access, the procedure itself and possible complications limit its wider use in a screening setting. However, colonoscopy allows immediate polyp removal and, if no lesions are found in a person at average risk, the procedure need not be repeated for 5 years.

Flexible sigmoidoscopy allows the lower bowel to be examined and is less complicated than colonoscopy. Flexible sigmoidoscopy can be combined with FOBT to improve test sensitivity.

FOBTs are effective because they detect blood that may be derived from cancers and adenomas. Positive tests identify people who have an increased risk of CRC and who require follow-up colonoscopy to determine the source of occult blood. FOBTs are simple, inexpensive and non-invasive; samples for testing can be collected at home. But the tests are less sensitive than colonoscopy and require repeating every 1-2 years.

Chemical (guaiac)-based FOBTs were used in studies that demonstrated the benefit of screening for reducing CRC mortality. There are now newer immunochemical FOBTs (faecal immunochemical tests or FITs) that have potential advantages, and many of our studies are based on the use of these new-generation FOBTs. Some of the key activities of the Bowel Health Service are briefly described below and help to illustrate some of the uncertainties that still relate to CRC screening.

Evaluation of new FOBTs

The studies giving evidence that FOBT-based screening is effective in reducing mortality from CRC used guaiac-based tests, in which the chemical activity of haem indicates the presence of haemoglobin in faecal samples. These guaiac tests require dietary and medication restrictions to increase specificity and are not specific for colonic haemoglobin. Newer FITs detect the globin portion of human haemoglobin; they do not cross-react with dietary components or medications, and are specific for colonic blood. We directly compared the performance of guaiac and immunochemical tests for their ability to detect cancers (and adenomas). While these studies are ongoing, preliminary data indicates that immunochemical tests have the higher sensitivity to cancer and large adenomas while maintaining test specificity.
Screening the above-average risk group

Surveillance is recommended for people with a significant family or personal history of CRC or colonic adenomas (polyps). For FMC and RGH patients, this meant that people were periodically recalled for surveillance colonoscopy, though an audit revealed that many patients were not receiving surveillance according to NHMRC guidelines. The Southern Cooperative Program for the Prevention of Colorectal Cancer (SCOOP) was created to provide improved CRC surveillance services for this above-average risk group on the FMC and RGH colonoscopy recall databases. Strategies included GP education, CRC risk assessment, colonoscopy recall and FOBT screening components.

GP education programs have resulted in greater awareness about and more appropriate referrals to the surveillance program. Reassessment of CRC risk levels has allowed more rational (usually increased) intervals to be determined, and audits have shown that the new intervals are now being closely adhered to, thus freeing up valuable colonoscopy resources.

The NHMRC has recently recommended that FOBT-based screening should be considered as an additional surveillance test, in years when colonoscopy is not performed. We have introduced FOBT screening in this group and are now well into a 5-year evaluation program. Results so far indicate that these patients are willing to participate in screening, and some have been diagnosed with cancers or adenomas through the screening program. It is not known whether these lesions developed rapidly, or whether they were missed at a previous colonoscopy, but the fact that FOBT-screening does reveal further neoplasia, and earlier than if only colonoscopy was used, is clearly of benefit.

Screening the average risk group - population screening.

One of the biggest challenges to FOBT-based population screening is simply to get people to complete the screening test. Without participation there is no detection, and participation rates in large screening trials have been typically 30-40%, well below the 70% target proposed and the goal for other cancer screening programs. A number of studies are underway that aim to determine the effect of various program variables on screening participation rates.

The effect of diet on participation

Client groups were offered a guaiac-based FOBT (Hemoccult, Beckman-Coulter) which required a modified diet during sample collection, or an immunochemical test (FlexSure, Beckman Coulter) which required no dietary modification. Participation was significantly lower in the group offered Hemoccult, indicating that dietary restriction has a strong negative effect on participation.

The effect of improved test technology

One FIT that has recently been developed (InSure, Enterix) incorporates an improved brush (rather than spatula) sampling process, coupled with a decrease in the number of faecal samples required, from three to two. We reasoned that these technological differences were likely to attract more participants. Three groups of invitees were offered screening using FOBTs that differed in their level of technology. We found that the highest level of participation was obtained in the group offered an FOBT incorporating technological improvements.

The effect of the GP on participation

When considering how to implement screening programs, options include a centralised screening service and programs based around general practices. The GP has a powerful influence on health behaviours, and we reasoned that screening offers endorsed by a GP might improve CRC screening rates. People could be screened either by invitation from the Bowel Health Service, or through their general practice with two levels of GP endorsement. Invitations signed by a GP resulted in a significantly higher level of screening participation (43.5%) compared to invitations that only indicated practice support (40.1%), or those received directly from the central Bowel Health Service (34.0%).

Differences between participants and non-participants

Our research trials allowed us to identify groups of participants and non-participants. We reasoned that the identification of differences between these groups could provide insights into key factors associated with screening behaviour. We developed a specific questionnaire to survey demographic, behavioural and psychosocial characteristics, and surveyed the two groups. We found that non-participants were more likely to find faecal sampling distasteful, while participants saw more value in screening and were more likely to attend future screening. This information can potentially be used to inform new strategies to overcome barriers to screening participation.

Development of a flexible sigmoidoscopy service

Flexible sigmoidoscopy is an effective screening modality for people at average risk of CRC, especially when performed together with FOBT. To increase screening options without impacting on colonoscopy services, the first nurse endoscopist in Australia has been trained and, in a nurse practitioner role, now undertakes flexible sigmoidoscopy screening at the Repatriation General Hospital.

Taken together, these research studies and initiatives demonstrate the commitment of this group of researchers and clinicians to the prevention of colorectal cancer through screening and early detection.
Other CRC screening initiatives in Adelaide.

Although not directly linked to our studies, a feasibility trial of population screening, the Federal Bowel Cancer Screening Pilot, is currently being conducted in selected postcodes in Adelaide, Melbourne and Mackay. While this trial is incomplete, early results indicate that it has been well received. It is hoped that this feasibility trial will ultimately lead to the introduction of an Australia-wide population-screening program for prevention of CRC.

Any questions relating to these research studies can be directed to the Bowel Health Service, Repatriation General Hospital on 08 8275 1075. Information about the SCOOP program can be obtained by calling 08 8204 8902.

References


Recommendations from optimising cancer care in Australia

The treatment experience and the quality and length of life of most people with cancer can be greatly improved if these recommendations are implemented. The three main themes predominating in these recommendations are quality, access and resourcing.

1. Integrated multi-disciplinary care:
   • that investigation of the incentives required to foster, maintain and evaluate integrated multi-disciplinary care in both the public and private sectors be undertaken.

2. Improving the cancer journey:
   • that a national process of quality-driven organisational reform be implemented to improve ongoing consumer access to information, palliative and supportive care throughout the cancer journey.

3. Voluntary accreditation:
   • that a system of voluntary accreditation for Australian cancer care services be developed, broadly modelled on that of the U.S. Commission on Cancer.

4. Access to clinical trials:
   • that the capacity to undertake clinical trials be increased, including development of a public register of trials.

5. Workforce:
   • that the recommendations of the National Strategic Plan for Radiation Oncology and the Specialist Haematological and Medical Oncology Workforce in Australia be implemented urgently and

6. • that the Australian Health Workforce Advisory Committee consider the entire non-medical cancer care workforce, especially cancer nurses, radiation physicists and radiation therapists as a priority.

7. Psycho-oncology:
   • that the need for psychologists and/or other appropriately trained health professionals be brought to the attention of the Australian Health Ministers Advisory Council.

8. Radiation oncology:
   • that the recommendations of the National Strategic Plan for Radiation Oncology be implemented.

9. Access to pharmaceuticals:
   • that a ministerial working party review and develop solutions to the problems of access to new and old cancer drugs.

10. Access to support for travel:
    • that there be a review of matters affecting access to cancer care, including travel to and from treatment centres.

11. Equity of access:
    • that the needs of special populations be the focus of efforts to narrow gaps in access to and utilisation of culturally sensitive services.

12. A national taskforce on cancer:
    • that a national taskforce be established to drive the reform process.

There are, in addition, 19 other action items which can be accessed at: www.ncci.org.au.