

## **Screening and Early Detection of Colorectal Cancer**

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Almost 1.4 million new cases of colorectal cancer (CRC) occur per year world-wide. In the United States, 137,000 new cases and 51,000 related deaths were reported in 2014. With globalization, CRC has become a highly prevalent disease in developed countries. Age-adjusted rates per 100,000 in some parts of Asia currently exceed those of the US. The long natural history of colorectal neoplasia affords the opportunity to improve survival through preventive measures. While life-style issues such as obesity and low physical activity contribute significantly to risk, these are difficult to alter on an individual basis. Rapid growth of knowledge about the molecular characteristics of cancers has provided useful insights into the pathogenesis of CRC and identification of early neoplastic lesions. Rapidly evolving knowledge of the pathogenesis of CRC, especially in high-risk groups, is allowing the development of new tools to identify those who will benefit most from preventive measures such as screening and chemoprevention.

Currently screening for adenomatous polyps and early-stage cancers provides the best opportunity to improve survival. Several professional societies, including those in the Asia-Pacific region, have established evidence-based guidelines for screening, but the recommended primary modality depends not only on individual test effectiveness, but cost-effectiveness when used in programmatic screening. The growing use of colonoscopy as a primary modality or in a two-step screening paradigm requires the institution of quality measures to reduce the rate of interval cancers. Risk stratification is a key factor, especially when resources are limited.

When detected early, the survival rate for CRC can be as high as 95% compared with approximately 7% for late stage disease. Screening provides the best opportunity for early detection. Over a 20 year period in the United States colorectal cancer incidence has declined by 35% with a corresponding 37% mortality reduction in mortality over the same time period. During this time screening rates have steadily increased. It is probable that adherence to screening guidelines may be further driven by the profound changes in the organization of medical care including programmatic screening and the rapid adaptation of electronic medical record systems enabling ease of referrals for screening, compliance reminders, and management tracking of compliance to care guidelines.

While the highest impact form of prevention is CRC screening, the development of effective, inexpensive, and safe chemopreventive agents would be of great benefit. Chemoprevention of CRC through the use of agents to prevent or suppress the progression of precursor lesions is a concept that is finding growing acceptance. Successful chemoprevention could supplement the benefit of screening colonoscopy by targeting missed lesions, addressing the development of interval lesions, decreasing the number of adenomas needed to be removed at future colonoscopy, and slowing the growth of early cancers.