

## *To Screen or Not to Screen for Cancer*

### *Key Points*

- ※ Prevention of cancer may take place at primary prevention and secondary levels. Cancer screening is just one of the ways to prevent cancer.
- ※ Primary prevention of cancer involves the adoption of a healthy lifestyle (including no smoking, no drinking, be physically active, having a balanced diet, maintaining an optimal weight and waist circumference, and practising safer sex), vaccination against infections (such as hepatitis B virus (HBV) and human papillomavirus (HPV)) and other health promoting practices (such as optimising sunlight exposure but avoiding excessive exposure, observing occupational safety and health rules, having childbirth at an earlier age and breastfeeding each child for a longer duration).
- ※ Secondary prevention of cancer includes early detection and screening.
- ※ Better awareness of signs and symptoms of cancer is a crucial part of cancer prevention. However, different types of cancer will have their own manifestations, depending on where and how big the cancer is, and how much it affects the organs or tissues. Besides, signs or symptoms involving different parts of the body may appear if a cancer has spread.
- ※ Cancer screening aims to look for abnormal lesions or cancers at an early stage before symptoms appear. However, not all cancers have a reliable screening test; not all screening tests are 100% accurate; and not everyone needs cancer screening.
- ※ In Hong Kong, the Cancer Expert Working Group on Cancer Prevention and Screening (CEWG) regularly reviews scientific evidence and provides local recommendations on cancer prevention and screening. Individuals considering a cancer screening test should talk to their family doctors about the need and obtain full information on the potential risks and benefits of having the test.

## To Screen or Not to Screen for Cancer

Cancer is a group of diseases that involves abnormal cell growth with the potential to invade or spread to other parts of the body. Globally, the incidence of cancer increased from 12.7 million in 2008 to 14.1 million in 2012. More importantly, this upward trend is projected to continue and the number of new cases will rise a further 75% to about 25 million over the next two decades.<sup>1</sup> Besides, cancer is a leading cause of death worldwide, accounting for 8.2 million deaths in 2012.<sup>2</sup> In Hong Kong, the number of new cancer cases rose an average of 2.5% per year since 2002 and reached a record high of 27 848 in 2012. Meanwhile, the number of registered deaths attributable to cancer increased 16.6% from 11 658 in 2002 to 13 589 in 2013.<sup>3</sup>

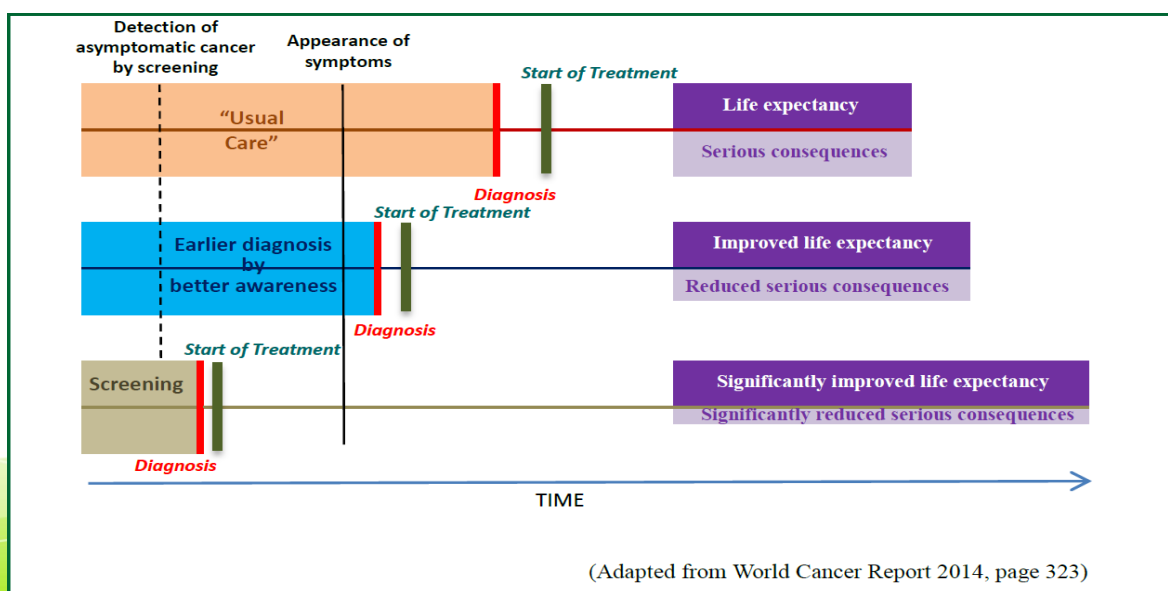
### Cancer Screening

Cancer screening is looking for abnormal lesions or cancers at an early stage before symptoms appear. When they are found early, treatment would be easier and have a better chance of cure. In fact, the transformation from normal cells to asymptomatic abnormal lesions and then to cancer cells is a multistage process. For cancers having a long precancerous stage, screening may offer a window of opportunity for early detection, diagnosis and treatment.<sup>4</sup>

### Benefits

As illustrated in Figure 1, earlier detection and diagnosis of asymptomatic cancers by screening along with earlier treatment can significantly increase life expectancy and reduce serious consequences of the disease. Delayed diagnosis and treatment upon the appearance of symptoms tended to have poorer outcomes.<sup>1</sup> For example, cervical cancer usually takes 10 to 20 years for asymptomatic precancerous lesions caused by HPV to develop into invasive cancer.<sup>5</sup> Pooled evidence from case-control studies showed that cytology screening (commonly referred to as the Pap smear) for cervical cancer was associated with 65% reduction in the incidence of invasive cervical cancer.<sup>6</sup> The development of polyps into colorectal cancer (CRC) can take more than 10 years.<sup>7</sup> Faecal occult blood test (FOBT) or endoscopic screening for CRC enables doctor to detect and remove pre-malignant polyps before they have a chance to become cancerous. Meta-analysis of randomised controlled trials on the effect of screening sigmoidoscopy among the general population at average risk found that screening sigmoidoscopy could reduce CRC incidence and mortality by 28% and 44% respectively. For screening colonoscopy, meta-analysis of observational studies observed 69% and 68% reduction in CRC incidence and mortality respectively.<sup>8</sup>

**Figure 1: Expected outcomes of cancer detection by screening, early diagnosis and “usual care”**



### *Limitations and Risks*

There are many different types of screening tests designed for detecting different types of cancer. Some of the screening tests are non-invasive (such as FOBT), while others are more invasive (such as sigmoidoscopy or colonoscopy) that can cause bleeding or other complications. More importantly, not all cancers have a reliable screening test to use (such as stomach cancer or oesophageal cancer).

Besides, no cancer screening test is perfect. A perfect screening test is one which can always detect the disease if it exists and always excludes the disease if it does not exist. However, cancer screening tests are not 100% accurate. There are false-positive and false-negative results. The false-positive result is the wrong indication of the presence of cancer despite the fact that it does not exist. This may cause unnecessary anxiety, trigger potentially risky investigations or treatment. For example, mammography is the most common screening test for breast cancer in women who have no sign or symptom of the disease. A Cochrane review showed that for every 2 000 women invited for screening for breast cancer with mammography throughout for 10 years, one would avoid dying of breast cancer; 10 healthy women would be treated unnecessarily; and more than 200 women would be falsely alarmed and experience significant psychological distress because of false-positive findings.<sup>9</sup> On the other hand, false-negative result indicates the failure of the screening test to detect cancer despite the fact that it is present. This can lead to false reassurance, delay in diagnosis and medical care. By screening mammography, studies implicated that about one in five breast cancers that were present at the time of screening might be missed. False-negative results occurred more often in young women and those with denser breast tissue.<sup>10</sup>

Not all cancer screening tests are helpful. Screening may not help if the cancers are fast-growing or if they have already spread. For some slow-growing cancers that otherwise would not have been found or posed any health threat in a person's lifetime, there are concerns of over-diagnosis and over-treatment. One example is screening for prostate cancer in men with prostate-specific antigen (PSA) test. A review of screening for prostate cancer reported that up to 50% of prostate cancers detected by PSA test were over-diagnosed.<sup>11</sup> While the effectiveness of PSA screening for prostate cancer in reducing prostate cancer-specific and overall mortality was still debatable, potential harms associated with PSA screening and subsequent diagnostic tests (such as a prostate biopsy) or treatment (such as surgery) were frequent, and moderate in severity (including infections, bleeding, erectile dysfunction and incontinence).<sup>11, 12</sup>

Furthermore, not everyone needs cancer screening. For certain cancers, regular screening would only be necessary for people who are at high risk of developing cancers (e.g. those who have a strong family history of cancer) when the benefits of screening clearly justify the risks of harm. For people who have average risk of developing cancers, screening may be unnecessary. In some situations, the screening test would confer more harms than benefits. Thus, individuals considering a cancer screening test should talk to their family doctors (especially in the context of their personal and family medical history) and obtain full information on the potential risks and benefits of having the test.

## Instituting a Cancer Screening Programme

There are different approaches to cancer screening, each with specific aims. For example, mass (population-based) screening involves the screening of the entire population within a certain age group. Selective (high-risk) screening refers to screening of particular population groups in high-risk categories. For opportunistic screening, it is offered to people who consult a health practitioner for other reasons.<sup>13</sup> Before a population-based cancer screening programme is instituted, a number of

criteria related to the characteristics of the disease (type of cancer) and its treatment, as well as the screening test have to be met (Table 1).<sup>13, 14</sup> With such strict criteria, only a few evidenced-based screening methods are currently used in national or regional cancer screening programme. They include screening for cervical cancer using cervical smear or HPV testing; and screening for CRC using FOBT, sigmoidoscopy or colonoscopy.<sup>1</sup>

**Table 1: Criteria for instituting a screening programme<sup>13, 14</sup>**

Disease	✓ Serious
	✓ High prevalence of preclinical stage
	✓ Natural history understood
	✓ Long period between first signs and overt disease
Diagnostic test	✓ Sensitive and specific
	✓ Simple and cheap
	✓ Safe and acceptable
	✓ Reliable
Diagnosis and Treatment	✓ Facilities are adequate
	✓ Effective, acceptable, and safe treatment available

### Cancer Screening in Hong Kong

In Hong Kong, the CEWG was set up in 2002 to regularly review scientific evidence and provide local recommendations on cancer prevention and screening. With the support of the CEWG, the Department of Health (DH) launched a population-based Cervical Screening Programme in collaboration with public and private service providers in 2004. To address the increasing burden of CRC in Hong Kong, a pilot programme to subsidise CRC screening for specific age groups is expected to be launched by end of this year the earliest. It aims to gather local experience and fill knowledge gaps surrounding CRC screening so that evidence-based findings and recommendations can be generated to inform decisions if screening should be extended to cover a wider population.

For breast cancer, the CEWG appraises that there is insufficient scientific evidence to recommend for or against population-based mammography screening for general female in Hong Kong. Likewise, there is insufficient scientific evidence to recommend whether population-based screening for prostate cancer in men in Hong Kong without any symptoms should or should not be done.<sup>15,16</sup> Table 2 presents the CEWG's recommendations that are based on the existing scientific evidence in relation to screening for cervical cancer, CRC, breast cancer and prostate cancer.

**Table 2: CEWG recommendations on screening for cervical cancer, colorectal cancer, breast cancer and prostate cancer**

<b>Cervical cancer<sup>17</sup></b>	<ul style="list-style-type: none"> <li>※ Women aged 25 to 64 years who have ever had sexual experience are recommended to have cervical smears every 3 years after two consecutive annual smears irrespective of whether they are single or married, have had sterilisation or reached menopause, or how long ago they had their last sexual experience.</li> <li>※ Women aged 65 years or above who have ever had sexual intercourse should seek their family doctor's advice on having a cervical smear if they have never had one before, even if they have reached menopause, had no sexual intercourse for a long time or had sterilisation.</li> <li>※ Women below the age of 25 who have had sexual experience and risk factors of cervical cancer (such as smoking or multiple sexual partners) should seek medical advice from their family doctors concerning the need for cervical cancer screening.</li> </ul>
<b>Colorectal cancer<sup>18</sup></b>	<ul style="list-style-type: none"> <li>※ Men and women aged 50 to 75 should discuss with their family doctors and consider screening for CRC by one of the following methods: FOBT every 1 to 2 years; or flexible sigmoidoscopy every 5 years; or colonoscopy every 10 years.</li> <li>※ High risk individuals (e.g. those with hereditary bowel disease or those with one or more first-degree relatives having CRC diagnosed at or below 60 years of age) should start CRC screening at an earlier age and have screening repeated at shorter time intervals as recommended by their family doctors.</li> </ul>
<b>Breast cancer<sup>16</sup></b>	<ul style="list-style-type: none"> <li>※ Women who are at higher risk of developing breast cancer (such as those with family history of breast cancer or being a carrier of certain gene mutations, e.g. BRCA1 or BRCA2) should seek advice from their family doctors about whether they should receive breast cancer screening, the starting age and frequency of screening.</li> </ul>
<b>Prostate cancer<sup>15</sup></b>	<ul style="list-style-type: none"> <li>※ Men without symptoms are encouraged to discuss with their family doctors about their individual circumstances and make informed decision on whether or not to go for prostate cancer screening.</li> </ul>



## Early Recognition of Cancer

Other than screening, better awareness of signs and symptoms of cancer is a crucial part for prevention of cancer.<sup>19</sup> However, different types of cancer have their own manifestations, depending on where and how big the cancer is, and how much it affects the organs or tissues. Besides, various signs or symptoms involving different parts of the body may appear if a cancer has spread. The following are some warning signs and symptoms of cancer that people should watch out for<sup>20</sup>:

- ✱ Change in bowel habits, such as diarrhoea or constipation with unknown reasons that lasts for more than 2 weeks;
- ✱ Change in bladder function, such as pain on passing urine or needing to pass urine more or less often than usual;
- ✱ Unusual bleeding or discharge, such as blood in stool or urine, bloody discharge from the nipple, abnormal vaginal bleeding, coughing up or vomiting blood;
- ✱ Unusual lumps or persistent swelling, such as in the neck, breast, armpit, groin or scrotum;
- ✱ Recent changes in a wart or mole or any new skin change, including change in colour, size or shape, unexplained rash or unusual texture;
- ✱ Sores that do not heal, e.g. in the mouth, on the tongue or penis;
- ✱ Nagging cough or chronic hoarseness;
- ✱ Persistent indigestion or trouble swallowing;
- ✱ Unexplained weight loss, e.g. 5% weight loss over one month;
- ✱ Fatigue that does not get better with rest.

Of note, diseases or conditions other than cancer can cause these signs and symptoms too. As no sign and symptom should be ignored or overlooked, especially if it has lasted a long time or is getting worse, please consult your family doctor for proper diagnosis and treatment as early as possible.

## Primary Prevention of Cancer

Cancer is largely a preventable disease. As Table 3 shows, major cancers are caused by or associated with a core set of common, modifiable risk factors related to lifestyle (Table 3). The World Health Organization estimates that more than 30% of cancer deaths could be prevented by modifying or avoiding key risk factors through adoption of a healthy lifestyle, along with vaccination against infections and other health promoting practices.<sup>2</sup>

**Table 3: Major cancers and their confirmed or probable risk factors**<sup>1, 16, 18</sup>

	Smoking	Physical inactivity	Unhealthy diet	Alcohol consumption	Obesity
Colorectal cancer	✓	✓	✓	✓	✓
Breast cancer	✓	✓	✓	✓	✓*
Liver cancer	✓			✓	✓
Stomach cancer	✓		✓		✓
Lung cancer	✓				

\* In postmenopausal women

The following are some general cancer prevention tips:

- ✱ Do not smoke and avoid secondhand smoke. Current smokers can call the Integrated Smoking Cessation Hotline of the DH at 1833 183 for free quit smoking advice and help;
- ✱ Be physically active. Adults should do at least 150 minutes of moderate-intensity physical activity (e.g. brisk walking, swimming slowly or cycling leisurely) or 75 minutes of vigorous-intensity physical activity (e.g. jogging, fast swimming or rope jumping), or equivalent amounts throughout the week. For children and young people, they should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily;
- ✱ Have a balanced diet with at least 5 servings of fruit and vegetables a day. Eat more whole-grains or unprocessed cereals. Limit consumption of red meat. Avoid processed meats, smoked or preserved foods. Do not eat mouldy nuts, cereals or pulses;

- ※ Do not drink alcohol. Alcohol is a cancer-causing substance. Alcohol drinkers are urged to scrutinise their own drinking habits and stop drinking completely;
- ※ Maintain an optimal body weight and waist circumference. For Chinese adults in Hong Kong, aim for a body mass index (BMI) between 18.5 and 22.9 kg/m<sup>2</sup>, and a waist circumference of less than 90 cm (~ 36 inches) for men and less than 80 cm (~ 32 inches) for women;
- ※ Practise safer sex (such as condom use) and avoid high risk sexual activity (such as having multiple sexual partners) to reduce the risk of getting cancers linked to sexually transmitted diseases;
- ※ Vaccinate against the infection of HBV. To date, two prophylactic vaccines against HPV infection have become available locally, targeting at specific HPV types.<sup>21</sup> Individuals considering HPV vaccination for personal protection should obtain full information about the vaccine and seek advice from their family doctors;
- ※ Optimise sunlight exposure but avoid excessive ultraviolet (UV) exposure. When having outdoor work or recreation, wear long sleeved clothing and broad-brim hat; apply broad-spectrum (with protection against both UVA and UVB), water-resistant sunscreen products with sun protection factor (SPF) 15 or above on usually exposed skin. Do not use UV-emitting appliances for tanning or other non-medical purposes;
- ※ Observe occupational safety and health rules and use protective equipment or clothing properly to reduce exposure to occupational carcinogens;
- ※ Have childbirth at an earlier age and breastfeed each child for longer duration (for women).

For more information about cancer prevention and screening, please visit <http://www.chp.gov.hk/en/content/9/25/31932.html>.

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Due to increasing cancer incidence, Non-Communicable Disease Division of Centre for Health Protection is launching a publicity campaign to promote primary and secondary prevention of cancer. A group of seven mascots named the “Healthy League” has been designed to provide a renewed and livelier way of putting across messages on cancer prevention via various media channels such as TV advertisements, newspaper and magazines, posters, website and Facebook fan page.

Captain AC (Captain Anti-Cancer) is the leader of the Healthy League. Each of the other mascots represents a particular area of cancer awareness and prevention. Please visit and share the Healthy League Facebook fan page and the thematic website on colorectal cancer:

[www.facebook.com/HealthyLeague](http://www.facebook.com/HealthyLeague)

[www.ColonScreen.gov.hk](http://www.ColonScreen.gov.hk)

*Let's prevent cancer together with the Healthy League!*

**Non-Communicable Diseases (NCD) WATCH** is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to [so\\_dp3@dh.gov.hk](mailto:so_dp3@dh.gov.hk).

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