

Health screening for older people—what are the current recommendations?

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Abstract

The world population of older people is on the rise with improved health services. With longevity, older people are at increased risk of chronic non-communicable diseases (NCDs), which are also leading causes of death among older people. Screening through case finding in primary care would allow early identification of NCDs and its risk factors, which could lead to the reduction of related complications as well as mortality. However, direct evidence for screening older people is lacking and the decision to screen for diseases should be made based on comorbidity, functional status and life expectancy, and has to be individualised.

Introduction

The world population is growing rapidly from 2.5 billion in 1950 to 6.9 billion in 2010.¹ By 2050, the world population of people aged 60 years and more is estimated to reach 2 billion. It is estimated that the proportion of older people living in the lower and middle-income countries such as Malaysia will increase from 60% in 2005 to 80% by 2050.² This growth is attributed to lower fertility rate, greater life expectancy and improved public health services. With increased longevity, more people are at risk of developing chronic non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes and malignancy.³ Approximately 50.0% of adults aged 60 year and more have at least one chronic non-communicable disease and about a third have at least two.² This would lead to a significant disability and diminished quality of life of the older people. In addition, among the people aged 60 years and more, NCDs accounts for more than 80.0% of the healthcare burden in low-, middle- and high-income countries. Globally, NCDs are the leading causes of death and these include ischaemic heart disease, stroke, chronic obstructive pulmonary disease, diabetes, hypertensive heart disease and malignancy.³ In 2012, approximately 45.0% of mortality among adults aged 70 years and more across the globe was due to NCDs.

Targetting the modifiable risk factors and early identification of NCDs in the “young old” (aged 60–75 years) have been shown to reduce morbidity and mortality significantly among older people.⁴ This in turn would decrease the

burden of chronic NCDs, promote the health of older people and improve independence. With this notion, screening for health problems that would emerge in later life was deemed as essential. At present, there are screening or preventive care guidelines for older people available as reference to guide primary care physicians.^{5–9} Most of these guidelines focus on older people’s functional ability and preventive activities in older age, which include screening for physical function, vision, hearing, cognition, osteoporosis, falls prevention and immunisation. Some of these guidelines do include screening for early detection of chronic NCDs.^{5,6,8} However, these guidelines discuss screening recommendations for all adults without a focus on older people. Therefore, the current review discusses the recommendations on preventive strategies and early detection of chronic NCDs in older people.

What is screening in primary care?

Screening is an assessment to “identify apparently healthy people who are at increased risk of a disease or health condition.”¹⁰ It is aimed to identify people who would be benefitted from further assessment. Screening in clinical practice is about case finding where the physician takes opportunity to request for a screening test that is more likely to result in follow-up as compared to mass screening. Screening should be on a defined target population and in the presence of scientific evidence on the effectiveness of the screening test.¹¹ In addition, the overall benefits of screening should outweigh harms.

What are the recommendations for screening diseases in older people?

From previous guidelines recommendations for early detection of diseases in adults include screening for cardiovascular risk, diabetes, certain cancers and depression.^{5,6,8}

Screening for cardiovascular risk

With longevity, chronic NCDs such as hypertension, dyslipidaemia and type 2 diabetes are becoming more prevalent among older people leading to significant cardiovascular diseases such as stroke and coronary heart diseases (CHDs), as well as related mortality.¹² Many screening guidelines have now included screening for cardiovascular risk. These include screening for high blood pressure, type 2 diabetes, dyslipidaemia and tobacco use.⁵⁻⁸ Most of these guidelines recommend to start the screening of adults who are 20 years old but do not suggest the upper age limit to stop screening. Since the prevalence of chronic NCDs also increases with age and do impact on older people's functionality and quality of life, therefore, these screening recommendations should extend to the older people in clinical practice too.

Screening for cardiovascular risks requires an understanding of coronary artery disease (CAD) risk assessment. The major risk factors include: advancing age, high total serum cholesterol and low density lipoprotein cholesterol (LDL-C), low levels of high density lipoprotein cholesterol (HDL-C), presence of type 2 diabetes and hypertension, cigarette smoking and family history of CAD. Family history of CAD includes "definite myocardial infarction or sudden death of father or other male first-degree relative before the age of 55 years or death of mother or other female first-degree relative before the age 65 years."¹³

a) Screening for high blood pressure

Hypertension is a common chronic NCD among older people with prevalence ranging between 52.0 and 72.0%.¹⁴ Similarly, the Third Malaysia Health and Morbidity Survey (2006) reported 74.0% of older people have hypertension.¹⁵ Hypertension is a known risk factor for CHD, stroke, heart failure and premature deaths. Treating hypertension has been shown to reduce these morbidities in people aged 60–69 years.¹⁶

A systematic review on screening for high blood pressure found screening program with comprehensive cardiovascular risk assessment and education session for people aged 65 years and more reduced the risk of admission for myocardial infarction (RR = 0.87, 95% CI = 0.79–0.97) and heart failure (RR = 0.90, 95% CI = 0.80–0.99).¹⁷ In addition, there were non-significant reduced trends in stroke (RR = 0.99, 95% CI = 0.88–1.12) and cardiovascular mortality (RR = 0.98, 95% CI = 0.92–1.04).

A meta-analysis also demonstrates indirect evidence for the benefits of treating hypertension regardless of its severity.¹⁶ Lowering the systolic blood pressure by 10 mmHg using antihypertensive agents in people aged 60–69 years could prevent 41.0% of stroke and 22.0% of CAD events. In addition, antihypertensive treatment is beneficial in people aged 80 years and more, which is associated with a 30% reduction in fatal or non-fatal stroke, a 39% reduction in stroke related mortality, a 21% reduction in all cause mortality, a 23% reduction in the rate of death from cardiovascular causes and a 64% reduction in the rate of heart failure.¹⁸ A systematic review showed that harms of pharmacologic therapy for early hypertension was minimal as they were associated with common side effects and serious adverse events were uncommon.¹⁹

The evidence for the effectiveness of screening for high blood pressure or hypertension in older people is limited. However, the indirect evidences showed that identification of older people with hypertension lead to treatment, which in turn improved the risk for cardiovascular diseases. Therefore, screening for high blood pressure or hypertension is suggested at regular clinic visits as recommended by other guidelines.⁵⁻⁷

b) Screening for type 2 diabetes

The prevalence of type 2 diabetes in the European and Asian people aged 60–79 years range between 10 and 20.0%.²⁰ Similarly in Malaysia, the prevalence increases with age with the highest proportion of 26.1% in the 60–64 years age group²¹ and is the leading cause of death.²² The International Diabetes Federation (2013) suggests that older people should be regularly examined for type 2 diabetes as it commonly remain undiagnosed until complications such as CAD and stroke appear, which is associated with significant morbidities and mortality.²³

At present, no randomised trial or cohort studies have evaluated the effectiveness of screening on the frequency of diagnosis, diabetes related complications and mortality in older people. A systematic review found that no previous quality studies have evaluated the health benefits of screening for type 2 diabetes in older people.²⁴ They found that aggressive blood pressure control in people with diabetes leads to 51.0% relative risk reduction of cardiovascular events. Hence, people with hypertension would benefit from the screening because the target for BP would be lower in people with concurrent diabetes than those without. American Diabetes Association (2014) recommends screening for type 2 diabetes in asymptomatic adults aged 45 years and more at 3-year intervals.²⁵ It is recommended that the screening should be done at a healthcare setting to ensure the follow-up screening. In addition, older people with other chronic NCDs such as hypertension and other cardiovascular diseases should be screened for type 2 diabetes as it is a common comorbid condition that is under-diagnosed.

c) Screening for dyslipidaemia

Another risk factor for cardiovascular disease is lipid disorders. High levels of cholesterol and LDL-C and low levels of HDL-C are independent risk factors for CHD. In Malaysia, the prevalence of dyslipidaemia increases with age reaching a peak of 57.2% (95% CI: 52.3–62.0) among the 65–69 year old age group.²⁶ Older people with increased level of total serum cholesterol had increased risk of acute coronary events when compared with middle-aged and younger people. Furthermore, lipid lowering drug therapy cause a 30.0% relative risk reduction in total CAD events and 26.0% relative risk reduction in CAD mortality in people with abnormal lipid levels.²⁷

The recommendation includes annual screening for older people with one or less CAD risk factor (other than age). In addition, screening is recommended at any point of clinical contact if they have multiple risk factors, which include presence of hypertension, diabetes and cigarette smoking.^{13,27,28}

d) Screening for tobacco use

Tobacco use, in particular cigarette smoking is a leading preventable cause of death and results in 6 million deaths annually from cardiovascular diseases, respiratory disease and

malignancy.²⁹ In Malaysia, 35.0% of men older than 60 years smoke cigarettes.³⁰ It is a leading cause of chronic NCDs such as CAD and lung cancer, and the primary cause of mortality. A meta-analysis reported the benefits of smoking cessation at the later age where the relative mortality of smokers reduced with the time since cessation (age 60–69 years: RR = 1.54, 95% CI = 1.41–1.68; 70–79 years: RR = 1.36, 95% CI = 1.25–1.49; 80 years and more: RR = 1.27, 95% CI = 1.04–1.56).³¹ In addition, smoking cessation after 60 years reduced the risk of total mortality among intermittent smokers (RR = 0.61, 95% CI = 0.54–0.70).³²

Smoking cessation interventions such as brief counselling sessions of less than 10 min (using the 5-A behavioural counselling framework: 1) Ask about use, 2) Advice to quit, 3) Assess willingness to quit, 4) Assist to quit and 5) Arrange follow-up and support) and pharmacotherapy are effective in increasing the proportion that achieves abstinence in a year (RR = 2.06, 95% CI = 1.81–2.34).³³ Therefore, at any point of clinical contact, older people should be screened for tobacco use and brief counselling for smoking cessation and pharmacotherapy should be provided to those who use tobacco.^{5,6}

Screening for cancers

Cancer is a leading cause of death in both developed and developing nations.³⁴ Approximately 60.0% of the new cancer cases and 65.0% of the cancer mortality occur in the less developed nations. Worldwide, most frequently diagnosed cancer—based on estimated age-standardised incidence and mortality rate, is breast cancer, followed by prostate cancer and lung cancer.³⁴ The increased burden of cancer is attributed to the population ageing and adoption of unhealthy lifestyle such as less physical inactivity, unhealthy diet and smoking. From previous recommendations on cancer screening in older people, it was proposed to include screening for colorectal cancer, lung cancer and breast cancer in women.^{5,6}

a) Colorectal cancer

Colorectal cancer is the third most common cancer worldwide, with more than 1.3 million (9.7%) new cancer cases and 693,881 (8.5%) cancer mortalities in 2012.³⁴ In Malaysia, it is the most common cancer in men (14.5%) and third most common in women (9.9%) of all

cancers between 2003 and 2005.³⁵ The cancer incidence rate is highest among older people aged 70 years and more for men (177.2 per 100,000 population) than women (133.6 per 100,000 population) in Malaysia. At present, colorectal cancer mortality rate in Malaysia is not available.

A meta-analysis of pooled data of 86,498 individuals recommends screening for colorectal cancer using faecal occult blood testing (FOBT) beginning at 50 years of age and to continue until 75 years every 2 years.³⁶ The colorectal cancer mortality rate has been reduced to 13.0% from 21.0% after 8 to 13 years of biennial FOBT screening in two trials. However, there was no reduction in the all-cause mortality. From their reviews, no studies have reported colorectal cancer mortality or long-term follow-up using other screening modalities such as colonoscopy, flexible sigmoidoscopy, CT colonography and faecal DNA testing. These recommendations were echoed by other guidelines.^{6,37}

b) Breast cancer screening

Breast cancer is one of the most frequently diagnosed cancer (25.2% of total new cancers) and one of the leading cause of cancer mortality (14.7% of total cancer mortality) in women in 2012 worldwide.³⁴ Similarly, in Malaysia it is the most commonly diagnosed cancer in all age groups of women accounting for 29.9% of total new cancers in 2006 and the peak incidence is between the age of 50 and 69 years.³⁸

In view of the significant burden of breast cancer, women aged 50–69 years would be benefitted from biennial screening mammography.³⁹ Meta-analysis of 600,830 women aged 40 years and more showed a 14.0% relative risk reduction of breast cancer mortality through early intervention in women aged 50–59 years (pooled relative risk (RR) of 6 trials = 0.86, 95% CI = 0.75, 0.99). It also reported a 32.0% relative risk reduction of breast cancer mortality in women aged 60–69 years (pooled RR of two trials = 0.68, 95% CI = 0.54, 0.87). Recommendation for women aged 70 years and more could not be determined because of lack of data on benefits or harms of screening mammography as most trials evaluating effectiveness of screening mammography did not include women of this age group. However, a meta analysis that included women aged 39–74 years from seven trials reported that screening mammography did

not significantly reduce breast cancer mortality after 7 (pooled RR = 0.93, 95% CI = 0.79, 1.09) and 13 years (pooled RR = 0.90, 95% CI = 0.79, 1.02).⁴⁰ Further, all-cause mortality was not significantly reduced following screening mammography (pooled RR = 0.98, 95% CI = 0.94, 1.03 after 7 years; and pooled RR = 0.99, 95% CI = 0.95, 1.03 after 13 years). In addition, the total numbers of lumpectomies (pooled RR = 1.31, 95% CI = 1.22, 1.42) and mastectomies (pooled RR = 1.20, 95% CI = 1.08, 1.32) were larger among those who were screened. Therefore, women who are invited for screening mammography should be fully informed about the benefits and harms of screening.

With regard to breast self-examination practice and clinical breast examination screening, clinical trials assessed in systematic reviews showed no reduction in all-cause and breast cancer mortality.^{39,41} Hence, both breast self-examination practice and clinical breast examination screening are not recommended in older people.

c) Lung cancer screening

Lung cancer is one of the most frequently diagnosed cancer (1.8 million (13.0%) of new cancer cases) and one of the leading causes of cancer mortality (1.5 million (19.4%) mortality) globally in 2012.³⁴ In Malaysia, lung cancer was reported as the third most frequently diagnosed cancers between 2003 and 2005, and it is the most frequently diagnosed cancer in men.³⁵

At present there is no recommendation for population screening for lung cancer. A randomised screening trial with 77,464 participants aged 55–74 years reported that chest radiography did not show any reduction in lung cancer mortality at 6 (RR = 0.91, 95% CI = 0.81, 1.03) and 13 years (RR = 0.99, 95% CI = 0.91, 1.07) after screening.^{42,43} However, the adults aged 55–74 years with 30 years and more pack-years of current smoking or who quit within the past 15 years who received annual low dose chest CT screening compared with annual chest radiography screening had a 20.0% relative risk reduction (RR = 0.80, 95% CI = 0.70, 0.92) in lung cancer mortality.^{43,44} Based on these findings, annual low dose chest CT screening in these high risk individuals is recommended for lung cancer screening.⁴⁴ However, further evidence is needed on the cost effectiveness of screening to justify recommendation.

d) Other cancer screening

With regard to prostate cancer, systematic reviews and meta-analysis found prostate specific antigen (PSA)-based screening in men aged 50-69 years after 9 years results in small or no reduction in prostate cancer-specific mortality (pooled RR = 1.00, 95% CI = 0.86, 1.17) compared to those who were not screened.^{45,46} Furthermore, screening was associated with over diagnosis and overtreatment harms such as false-positive results for PSA test, infection and bleeding. It is not recommended to screen older men for prostate cancer, but if they request for the test, patients must be fully counselled about the benefits and harms of the screening.⁶ No studies evaluated the independent role of screening by digital rectal examination.

As for cervical cancer screening, it is not recommended in women aged 65 years and more with three successive negative smears in the past 10 years.⁴⁷ Screening is only recommended in the presence of previous abnormal smears (cervical intraepithelial grade II or more severe diagnosis) or patient may request if she has never been screened in the past.

Screening for depression in later life

Depression is a leading cause of disease burden in middle- and high-income countries with an overall prevalence rate of depressive symptoms among older people worldwide ranging between 10.0 and 20.0%.⁴⁸ In Malaysia, the prevalence of depression among older people attending primary care clinic was 18.0%.⁴⁹ Even though the effective treatment for older people is available but depression is frequently missed or under treated.⁵⁰ Furthermore, it is associated with disability, poorer outcome from physical illness and even mortality. A meta-analysis of 5693 patients showed that screening and feedback of the results alone has no impact on the detection of depression (RR = 1.00, 95% CI = 0.89, 1.13).⁵¹ However, screening older people for depression in primary care is likely to be effective if other clinic's staff provide support for depression care in terms of geriatric assessment and supportive care together with the primary care physician's treatment.⁵²

Table 1 summarises the recommendations for screening in older people in primary care.

Table 1. Screening recommendations for older people

	Recommendations	*Evidence/ recommendation grade
High blood pressure or hypertension	Screening is recommended at regular clinic visits in view of strong evidence on the benefit of treatment in individuals with hypertension	Level I/A
Type 2 diabetes	Screening of asymptomatic older people with underlying hypertension or other cardiovascular disease is recommended at any point of contact	Level II-1/B
Dyslipidaemia	It is recommended that older people with one or less CAD risk factor (other than age) for annual screening Those with multiple risk factors (hypertension, diabetes and cigarette smoking) to be screened at any point of clinical contact	Level I/A
Tobacco use	Older people should be screened for tobacco use at any point of clinical contact Brief counselling for smoking cessation and pharmacotherapy should be provided to those who use tobacco	Level I/A
Colorectal cancer	FOBT beginning at 50 years of age and to be continued until 75 years every 2 years is recommended	Level I/A

	Recommendations	*Evidence/ recommendation grade
Breast cancer	Older women up to 69 years of age with no risk factor for breast cancer would be benefitted from biennial screening mammography, but they must be fully informed about the benefits and harms of screening	Level I/B
Lung cancer	Insufficient evidence to recommend for or against screening for lung cancer with low dose chest CT screening in high risk individuals (based on age and smoking status)	Level I/I
Prostate cancer	It is not recommended to screen older men for prostate cancer If patients request for the test, they must be fully counselled about the benefits and harms from screening	Level I/D
Cervical cancer	Women aged 65 years and more with three successive negative smears in the past 10 years is not recommended for cervical cancer screening	Level III/D
Depression	Screening older people for depression in is recommended if clinical staff to assist primary care physicians in providing depression care is available	Level I/B

*Based on US Preventive Service Task Force⁵

Evidence level:

- Level I = Evidence obtained from systematic reviews of randomised controlled trials or at least one properly randomised controlled trial.
- Level II-1 = Evidence obtained from well-designed controlled trials without randomisation.
- Level II-2 = Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one centre or research group.
- Level II-3 = Evidence obtained from multiple time series with or without the intervention.
- Level III = Opinion of respected authorities, based on clinical experience; descriptive studies and case reports, or reports of expert committees.

Grade of recommendation (based on):

- A = Recommends the service. There is high certainty that the net benefit is substantial.
- B = Recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
- C = Recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.
- D = Recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.
- I = The current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

Conclusion

The key challenge of screening in older people is the lack of evidence to guide recommendations for older people as no studies directly link the screening processes with beneficial health outcomes among older people.⁵ Furthermore, the effectiveness of preventive strategies in older people in the presence of geriatric syndromes and multiple comorbidities has not been addressed. Therefore, it is suggested that the outcome of screening in older people should not only focus on mortality but on function and health-related quality of life as the key outcome; it would be an important outcome to assess the effectiveness of

the provision of healthcare services, especially in older people in view of their life expectancy and functionality.⁵³ Primary care physicians' decision to screen older patients during clinic visits should be based on presence of comorbidities, their life expectancy and functional status, and should be individualised.^{5,54} In addition, older patients should be made aware of the potential benefits and harms of screening prior to the screening test.

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