GUIDELINE

Breast cancer screening guideline for Chinese women
China Anti-Cancer Association, National Clinical Research Center for Cancer (Tianjin Medical University Cancer Institute and Hospital)

The incidence of breast cancer is increasing year-by-year and is the most common malignant tumor in Chinese women. During the past half century, numerous studies in various countries around the world have confirmed that breast cancer screening is the most effective way of improving the rate of early diagnosis, survival rate, and the quality of life of breast cancer patients. Developed countries such as European countries, the United States, and Japan have developed and implemented guidelines for population-based breast cancer screening since the end of the last century. The 5-year survival rate of breast cancer has been increased to 89%. The World Health Organization has stated that early breast cancer is a curable disease, and early diagnosis/treatment is the best way to improve the survival rate of breast cancer.

With the development of China’s social economy and the comprehensive construction of a well-off society, raising the level of prevention and control of breast cancer is an important task for the Chinese government. Chinese women generally have smaller and denser breasts than Western women. The peak onset age for breast cancer in Chinese women is between 40 and 50 years, which is younger than that in Western countries by 5 to 10 years. Therefore, the development of a population-based breast cancer screening guideline suitable for Chinese women is imperative.

In cooperation with the National Clinical Research Center for Cancer (Tianjin Medical University Cancer Institute and Hospital), the China Anti-Cancer Association organized an interdisciplinary expert group consisting of clinicians, epidemiologists, biostatisticians, and public-health administrators to design and implement three large-scale breast cancer screening projects, including the Chinese National Breast Cancer Screening Program (CNBCSP) which targets urban women (CNBCSP-Urban), the CNBCSP-Rural project which targets rural women, and the Chinese Breast Cancer Multi-modality Independent Screening Trial (MIST). These three programs have obtained basic data on population-based breast cancer screening in China, particularly the MIST program. In MIST, all participants received clinical breast examination (CBE), breast ultrasonography (BUS), and mammography (MAM) separately and concurrently. Pathological examination is recommended for any positive or suspicious CBE, BUS, or MAM findings.

By summarizing the current evidence on breast cancer screening in Chinese women, referring to the latest breast cancer screening guidelines of Western and East Asian countries, and considering the present social and economic conditions in China, the guideline development group (GDG) formulated the population-based breast cancer screening guideline for women at average-risk and those at high-risk, respectively. The guideline provides recommendations for breast cancer screening according to the following three aspects: age of screening, screening methods, and screening interval.

Age of screening

• Women aged 45–69 years and with an average risk of breast cancer should undergo regular screening (Level A recommendation).

• Women aged 40–44 years and with an average risk of breast cancer should have the opportunity to receive screening. They are encouraged to fully understand the potential benefits, risks and limitations of breast cancer screening, and then consult with their doctors to make individualized decisions on screening (Level B recommendation).

• Women aged 69 years and older and with an average risk of breast cancer should have the opportunity to continue screening as long as their overall health is good and they have a life expectancy of 10 years or longer (Level B recommendation).

• Women with a high risk of breast cancer such as a family history of early-onset breast cancer and pathogenic genetic mutations should start regular screening at 35 years of age. Women with a high risk of breast cancer but without a family history of early-onset breast cancer or pathogenic genetic mutations should start regular screening at 40 years of age.
Screening methods

- MAM has been proven to be effective in reducing breast cancer mortality. It is recommended as the primary breast cancer screening method for women with an average risk of breast cancer (Level A recommendation).
- BUS can effectively increase the detection rate of breast cancer among women with dense breasts after negative MAM results of. It is recommended as a supplementary screening method after MAM in women with dense breasts (Level B recommendation).
- CBE is not recommended as a primary screening method due to insufficient evidence. However, CBE might increase the detection rate of breast cancer in women who have never been screened. Therefore, CBE is recommended as a preliminary screening method before imaging screening (Level B recommendation).
- Breast magnetic resonance imaging (MRI) is recommended as a primary screening method for women with a high risk of breast cancer such as a family history of early-onset breast cancer and pathogenic genetic mutations. Breast MRI is also recommended as a supplementary screening method after negative MAM and BUS findings for women with a high risk of breast cancer but without a family history of early-onset breast cancer or pathogenic genetic mutations (Level C recommendation).
- BUS is recommended as the primary screening method for women aged 40−44 years and with a high risk of breast cancer but without a family history of early-onset breast cancer or pathogenic genetic mutations. MAM combined with BUS is recommended for women aged 45 years and older and with the same high risk of breast cancer (Level B recommendation).

Screening interval

- Women with an average risk of breast cancer should undergo biennial MAM (Level A recommendation).
- Women with a high risk of breast cancer such as a family history of early-onset breast cancer and pathogenic genetic mutations should undergo annual breast MRI (Level B recommendation).
- Women aged 40−44 years and with a high risk of breast cancer but without a family history of early-onset breast cancer or pathogenic genetic mutations should undergo annual BUS. If BUS is negative, a supplementary breast MRI is recommended. Women aged 45 years and older and with the same high risk of breast cancer should undergo annual screening with MAM in combination with BUS. If MAM and BUS are both negative, a supplementary breast MRI is recommended (Level C recommendation).

Definitions

- Screening: Use of effective, convenient, and economical examinations, tests, or other methods to identify the possible presence of an as-yet-undiagnosed disease in individuals without signs or symptoms. Screening is a measure used to identify individuals with pre-symptomatic or unrecognized symptomatic disease from the general population, rather than a diagnosis of the disease.
- Opportunistic screening: Individuals who actively or voluntarily seek screening in institutions that provide a screening service.
- Population-based screening: Screening is provided for the general population and organized by national or local government, or work units.
- Breast Cancer Screening: Use of effective, convenient, and economical breast examination methods to identify the possible presence of an as-yet-undiagnosed breast cancer in individuals without signs or symptoms. Breast cancer screening aims to detect breast cancer at an early stage, and ultimately reduce breast cancer mortality in the general population.
- Women with an average risk of breast cancer: Women who do not have a high risk of breast cancer (refer to the definition of women with a high-risk of breast cancer).
- Women with a high risk of breast cancer: Women who meet at least one of the following criteria: (1) women with at least two first/second-degree relatives ever diagnosed with breast cancer; (2) women with at least one first-degree relative carrying known BRCA1/2 pathogenic genetic mutations; (3) women with at least one first-degree relative ever diagnosed with breast cancer and with at least one of the following: (a) one first-degree relative with age at diagnosis of breast cancer equal to or younger than 45 years; (b) one first-degree relative with age at diagnosis of breast cancer from 45 years to 50 years and at least one first-degree relative ever diagnosed with ovarian epithelial cancer, fallopian tube cancer or primary peritoneal cancer at any age; (c) one first-degree relative with two primary breast cancers and age at diagnosis of first primary breast cancer equal to or younger than 50 years; (d) two first-degree relatives ever diagnosed with ovarian epithelial cancer, fallopian tube cancer or primary peritoneal cancer at any age; (e) one male first-degree relative with breast cancer; (4) women carrying
known pathogenic genetic mutations associated with breast cancer; (5) women with at least one first-degree relative ever diagnosed with hereditary tumor syndrome, such as hereditary breast and ovarian syndrome, Cowden syndrome, Li-Fraumeni syndrome, Peutz-Jeghers syndrome, or Lynch syndrome, etc.; (6) women ever diagnosed with moderate to severe dysplasia in the breast duct/lobule or lobular carcinoma in situ; or (7) women ever received chest radiotherapy.

- Family history of early-onset breast cancer: At least one first-degree relative who has ever been diagnosed with breast cancer before the age of 45 years.
- First-degree relatives: A person’s parents, children, and siblings.
- Second-degree relatives: A person’s grandparents, uncles and aunts.

**Recommendation level descriptions**

Level A recommendation: Based on high-quality studies with adequate evidence and consistent conclusions (GDG highly recommended).

Level B recommendation: Based on studies with limited evidence or relatively consistent conclusions (GDG moderately recommended).

Level C recommendation: Based on clinicians’ experiences or observational research with a lack of rigorous design (GDG generally recommended).

This guideline is the first population-based breast cancer screening guideline for Chinese women, and will further guide breast cancer screening practice, improve the rate of early diagnosis, reduce the mortality rate, and decrease the burden of breast cancer in Chinese women. In the future, in order to update the current guideline, large-scale and well-designed randomized controlled trials with long-term follow-up are needed to determine the effectiveness of new screening methods and strategies, answer other questions regarding the current screening practices in China, provide more definite evidence on breast cancer screening to fit the characteristics of Chinese women, and ultimately improve the health of Chinese women.

Members of the guideline development group:

**Xishan Hao:** China Anti-cancer Association, NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Zhongsheng Tong:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Kexin Chen:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Ying Wang:** China Anti-cancer Association, NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Peifang Liu:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Lin Gu:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**JunTian Liu:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Jinpu Yu:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Fengji Song:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Yuebi Huang:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Wenhua Zhao:** China Anti-cancer Association, NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Yehui Shi:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Hui Li:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

**Huanyuan Xiao:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

Manuscript written by **Yuebi Huang:** NCRCC(Tianjin Medical University Cancer Institute and Hospital)

NCRCC: The National Clinical Research Center for Cancer

---

For more details, please read Interpretation of breast cancer screening guideline for Chinese women. Cancer Biol Med. 2019; 16: 825-35. doi: 10.20892/j.issn.2095-3941.2019.0322

Cite this article as: Breast cancer screening guideline for Chinese women. Cancer Biol Med. 2019; 16: 822-4. doi: 10.20892/j.issn.2095-3941.2019.0321