

IARC Handbooks of Cancer Prevention Breast cancer screening, Volume 15 (2016)

| Type of evaluation | Agent ^a | Evidence |
|---|--|-------------------|
| Mammography | | |
| Efficacy | Efficacy of screening women aged 50–69 years by mammography in reducing breast cancer mortality | <i>Sufficient</i> |
| | Efficacy of screening women aged 40–49 years by mammography in reducing breast cancer mortality | <i>Inadequate</i> |
| | Efficacy of screening women over 69 years by mammography in reducing breast cancer mortality | <i>Inadequate</i> |
| | Most appropriate mammography screening interval for reducing breast cancer mortality | <i>Inadequate</i> |
| Effectiveness | Effectiveness of inviting women aged 50–69 years to service mammography screening in reducing breast cancer mortality | <i>Sufficient</i> |
| | Effectiveness of attendance to service mammography screening in women aged 50–69 years in reducing breast cancer mortality | <i>Sufficient</i> |
| | Effectiveness of service mammography screening for women aged 40–44 years in reducing breast cancer mortality | <i>Limited</i> |
| | Effectiveness of service mammography screening for women aged 45–49 years in reducing breast cancer mortality | <i>Limited</i> |
| | Effectiveness of service mammography screening for women aged 70–74 years in reducing breast cancer mortality | <i>Sufficient</i> |
| Adverse effects | Occurrence of overdiagnosis of breast cancers during organized mammography screening | <i>Sufficient</i> |
| | Risk of radiation-induced cancer from mammography in women aged 50 years and older is substantially outweighed by the breast cancer mortality reduction from mammography screening | <i>Sufficient</i> |
| | A false-positive mammogram has short-term negative psychological consequences | <i>Sufficient</i> |
| Overall effectiveness | There is a net benefit from inviting women aged 50–69 years to organized mammography screening | <i>Sufficient</i> |
| Cost-effectiveness | Mammography screening for women aged 50–69 years can be cost-effective in countries with high breast cancer incidence | <i>Sufficient</i> |
| | Breast cancer screening can be cost-effective in low- and middle-income countries | <i>Limited</i> |
| Ultrasound as an adjunct to mammography screening in women with dense breasts and negative mammography | | |
| Effectiveness | Reduction in breast cancer mortality | <i>Inadequate</i> |
| | Increase in the detection rate of cancers | <i>Limited</i> |

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| | Reduction in the rate of interval cancers | <i>Inadequate</i> |
| Adverse effects | Increase in false-positive screening outcomes | <i>Sufficient</i> |
| Mammography with tomosynthesis (2D/3D-mammography) compared to mammography alone | | |
| Effectiveness | Reduction in breast cancer mortality | <i>Inadequate</i> |
| | Increase in the detection rate of cancers | <i>Sufficient</i> |
| | The incremental detection is mostly of invasive cancers | <i>Limited</i> |
| | Decrease in false-positive screening outcomes | <i>Limited</i> |
| | Reduction in the rate of interval cancers | <i>Inadequate</i> |
| Adverse effects | Increase in the radiation dose ^b | <i>Sufficient</i> |
| Screening of high-risk women | | |
| Effectiveness | In women with a BRCA1/2 mutation, screening with MRI will reduce breast cancer mortality as compared to women without BRCA1/2. | <i>Inadequate</i> |
| Sensitivity and specificity | In women with a high familial risk and a BRCA1/2 mutation, MRI as an adjunct to mammography screening increases the sensitivity and decrease the specificity of the screening. | <i>Sufficient</i> |
| | In women with a high familial risk and without a known BRCA1/2 mutation, MRI as an adjunct to mammography screening increases the sensitivity and decrease the specificity of the screening. | <i>Limited</i> |
| | In women with a high familial risk, the sensitivity of ultrasound alone is similar to or lower than that obtained with mammography alone, and lower than that obtained with MRI alone. | <i>Sufficient</i> |
| | In women with a personal history of breast cancer, the sensitivity and specificity of mammography are lower than those in women without such history. | <i>Limited</i> |
| | In women with LCIS or atypical proliferations, the sensitivity of mammography is equal to and the specificity lower than that in women without such history. | <i>Limited</i> |
| Incremental detection rate | In women with a high familial risk screened with MRI and mammography, clinical breast examination increases the detection rate of breast cancer. | <i>Inadequate</i> |
| | In women with a personal history of breast cancer, ultrasound as an adjunct to mammography increases the detection rate of breast cancer | <i>Inadequate</i> |
| | In women with LCIS or atypical proliferations, MRI as an adjunct to mammography increases the detection rate of breast cancer | <i>Inadequate</i> |
| Increase in false-positive screening outcomes | In women with a personal history of breast cancer, ultrasound as an adjunct to mammography increases false-positive screening outcomes compared with those without such history. | <i>Inadequate</i> |

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| | In women with a personal history of breast cancer, MRI as an adjunct to mammography plus ultrasound increases false-positive screening outcomes compared with those without such history. | <i>Inadequate</i> |
| | In women with LCIS or atypical proliferations, MRI as an adjunct to mammography increases false-positive screening outcomes compared with mammography. | <i>Limited</i> |
| Clinical breast examination | | |
| | Reduction in breast cancer mortality | <i>Inadequate</i> |
| | Shift in the stage distribution of tumours detected towards lower stage | <i>Sufficient</i> |
| Breast self-examination | | |
| | Reduction in breast cancer mortality by teaching BSE | <i>Inadequate</i> |
| | Reduction in the rate of interval cancers by teaching BSE | <i>Inadequate</i> |
| | Reduction in breast cancer mortality in women who practice BSE competently and regularly | <i>Inadequate</i> |

LCIS: Lobular Carcinoma In Situ; MRI: Magnetic Resonance Imaging

^a The full wording of the evaluations as agreed by the Working Group will be available in the full report.

^b Reconstructing the 2D images from the tomosynthesis acquisition substantially reduces the radiation dose compared to that of dual acquisition of mammography and tomosynthesis.