

## EARLY CANCER DETECTION: SCREENING METHOD

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Early detection of cancer is pivotal in improving patient outcomes and reducing mortality rates. Screening methods play a crucial role in identifying cancer at its nascent stages, facilitating timely interventions and treatment. This abstract focuses on various screening methods employed for early cancer detection, highlighting recent advancements and updates in the field. One of the most widely utilized screening methods is imaging-based screening, including mammography for breast cancer, colonoscopy for colorectal cancer, and low-dose computed tomography (LDCT) for lung cancer. These techniques enable the visualization of abnormal growths or lesions, aiding in the early diagnosis of cancer. In addition to imaging, biomarker-based screening has gained prominence in recent years. Biomarkers such as circulating tumor DNA (ctDNA), microRNAs, and protein markers offer non-invasive methods for detecting cancer-related changes in the body. These biomarkers not only enhance early detection but also contribute to monitoring treatment response and disease progression. Furthermore, advances in technology have led to the development of novel screening approaches, including liquid biopsy and artificial intelligence (AI)-assisted diagnostics. Liquid biopsy allows for the analysis of tumor-derived materials circulating in bodily fluids, offering a minimally invasive alternative to traditional tissue biopsies. AI-driven algorithms aid in the interpretation of screening results, improving accuracy and efficiency in cancer detection. Despite these advancements, challenges persist in achieving widespread adoption and accessibility of screening methods, including cost barriers and disparities in healthcare access. Efforts to address these challenges, coupled with ongoing research and innovation, hold promise for further improving early cancer detection and ultimately reducing the global burden of cancer-related morbidity and mortality.

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