

AbstractID: 4153 Title: Effect of Reader Variability on Improvements in Breast  
Cancer Detection Rates

Previous investigations have demonstrated variability among radiologists in the interpretation of screening mammograms. This presentation will discuss the extent of this variability and its effect on clinical trials that compare the conventional screening-film mammography and new technologies such as full-field digital mammography (FFDM) and computer-aided detection (CADe). We will present data on breast cancer detection rates at the conventional screen-film mammography of over 500 practicing community radiologists in the US. By postulating a large improvement in the cancer detection rate that would be achieved with a hypothetical new technology, we predicted the cancer detection rate that would be observed in a hypothetical clinical trial comparing the new technology and the conventional screen-film mammography. Despite a large postulated improvement in the cancer detection rate, it is difficult for clinical trials to demonstrate this improvement. Variability among radiologists in the observed cancer detection rates is an important cause for this difficulty. Clinical trials need to include large samples of radiologists in addition to large samples of patients to achieve sufficient statistical power to detect an improvement in the breast cancer detection rate in screening mammography. FFDM and CADe clinical trials, many of which appear to lack statistical power, will be discussed.

Educational Objectives:

1. To understand the sources and extent of variability in radiologists' breast cancer detection rates in screening mammography.
2. To understand the impact of reader variability on clinical trials that compare imaging technologies in screening mammography.
3. To understand the need to sample a large number of radiologists in addition to sampling a large number of patients to demonstrate an improvement in breast cancer detection rate in screening mammography.

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