

International Breast Cancer Screening Network (IBSN)

Biennial Meeting

Crowne Plaza Ottawa ♦ May 10–11, 2006

ABSTRACTS

- TITLE:** Measuring and Improving Radiologists' Interpretative Performance on Screening Mammography
- AUTHORS:** K Kerlikowske, D Buist, D Miglioretti, B Geller, P Carney, R Rosenberg, B Yankaskas
- WORK AFFILIATION:** University of California, San Francisco
- ADDRESS:** 4150 Clement Street, VAMC (111A1), San Francisco, CA 94121
- KEYWORDS:** Screening, mammography, performance measures
- BACKGROUND:** Technical quality of mammography has improved since implementation of the Mammography Quality Standards Act, yet mammography performance measures remain variable in the United States. Patient characteristics (age, hormone therapy use, family history of breast cancer, body mass index) and physician characteristics (years since graduation from medical school and possibly volume of mammography examinations interpreted per year) account for some of the variability, but not all.
- OBJECTIVE:** Evaluate factors that influence performance measures, and examine various methods to assess mammography interpretative skills and improve mammography interpretation.
- METHODS:** This presentation will provide an overview of three research projects designed to test and improve mammography interpretation skills in a national sample of 321 radiologists who participate in the NCI-funded Breast Cancer Surveillance Consortium, established in 1994. We plan to (1) determine the effects of volume of mammography examinations interpreted per year on clinical performance measures, controlling for patient, physician, and facility factors; (2) create assessment test sets that consist of representative screening examinations from community practice to assess radiologists' interpretation skills and identify an assessment test set that is associated with performance in clinical practice; and (3) develop and test two educational interventions designed to improve radiologists' interpretation skills.
- RESULTS:** The proposed research will provide new information that could have a significant impact on improving mammography interpretation. Determining whether volume of mammography examinations interpreted per year influences clinical performance may inform the U.S. Food and Drug Administration about whether to increase the recommended minimum number of examinations interpreted over 2 years. Developing a method to determine the skill level of radiologists who interpret screening mammography will help identify radiologists who may benefit from additional training. Learning how to improve interpretive skills through educational interventions may help to consistently provide high-quality mammography screening to all women in the United States.

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- TITLE:** Improvement in Screening Radiologists' Performance in an Organized Screening Program
- AUTHORS:** NAT Wadden, G Doyle
- WORK AFFILIATION:** Breast Screening Program for Newfoundland and Labrador
- ADDRESS:** St. Clare's Mercy Hospital, 154 LeMarchant Road, St. John's, NL A1C 5B8 Canada
- KEYWORDS:** breast cancer, screening
- BACKGROUND:** Core indicators and targets for the evaluation of performance and quality of Canadian organized screening programs have been developed. The radiologist-specific indicators include abnormal call rate, invasive cancer detection rate, positive predictive value, benign to malignant open biopsy ratio, and invasive cancer tumour size.
- OBJECTIVE:** To improve the performance of screening radiologists in an organized screening program as measured by screening program indicators.
- METHODS:** In 1998, a radiology review process was instituted for all screening radiologists involved with the Breast Screening Program for Newfoundland and Labrador. All abnormal mammograms were reviewed along with work-up films. Pathology was reviewed when applicable. Screen-detected cancers, interval cancers, and missed cancers were reviewed in relation to previous examinations if available. Ongoing confidential feedback was given to each screening radiologist regarding relevant indicators with objectives for improvement if necessary. Progress was reviewed quarterly.
- RESULTS:** At the beginning of the program, the average abnormal call rate was greater than 10%. After 4 years, the average abnormal call rate was less than 6%. Sensitivity and specificity rates also increased, and interval cancer rates decreased. This presentation reviews the methods used in the Breast Screening Program for Newfoundland and Labrador to evaluate radiologists' performance and reach targets.

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- TITLE:** Influence on Screening Performance of Second Reading Strategies in Two Low-Volume Programs
- AUTHORS:** JL Bulliard, C Jemelin, J-P De Landtsheer, D Lepori, F Levi
- WORK AFFILIATION:** Cancer Epidemiology Unit, University Institute of Social and Preventive Medicine, Lausanne, Switzerland
- ADDRESS:** University Institute of Social and Preventive Medicine, Rue du Bugnon 17, 1005 Lausanne, Switzerland
- KEYWORDS:** Switzerland, performance indicators, organized mammography screening, radiologists, volume of readings
- BACKGROUND:** The European Guidelines specify a minimum of 5,000 screening cases to be read yearly by radiologists carrying out second reading in non-centralized programs. This professional requirement is difficult to reach and/or to implement in regional programs covering a sparse population with a high number of participating radiology units, so that alternative blind double reading strategies must be devised.
- OBJECTIVE:** To evaluate the effect on breast cancer screening performances of two second-reading strategies used in non-centralized, low-volume programs.
- METHODS:** Reading performances in two Swiss regional breast cancer screening programs (cantons of Wallis and Vaud), covering female populations, aged 50–69, of about 31,000 and 72,000 inhabitants were computed and compared. Both programs had similar screening regimens and organizations, but differed with respect to second reading. One setting applied a selective strategy whereby only experienced radiologists performed second readings; the other elicited not to restrict second readers on the basis of their individual screening activity. Analysis included some 140,000 mammograms performed between 1999 and 2005.
- RESULTS:** Overall, screening performances improved with increasing total volume of reading, albeit not in a linear fashion. Regardless of setting, radiologists attained a higher level of screening accuracy when performing second rather than first readings, and incident rather than prevalent screening cases. The effect of a selective, small group of second readers appeared to impact favorably on the false-positive rate and other indicators of screening quality. As the learning curve depends on the number of mammograms read, these distinct strategies may bear different outcomes in the long run. Implications and practical issues for low-volume programs are discussed.

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- TITLE:** Influence of Radiologist Reading Volumes on Screening Outcomes: A Pan-Canadian Study
- AUTHORS:** AJ Coldman, D Major, G Doyle, Y D'yachkova, N Phillips, J Onysko, R Shumak, N Smith, N Wadden
- WORK AFFILIATION:** Population and Preventive Oncology, British Columbia Cancer Agency
- ADDRESS:** 800–686 West Broadway, Vancouver, British Columbia V5Z 1G1 Canada
- BACKGROUND:** Screening outcomes are dependent upon the accuracy of screening interpretation. One of the factors believed to influence mammography interpretation is the value of screens read by the radiologist. U.S. legislation requires that 960 mammograms be read biennially, while Canadian Association of Radiologist Accreditation requires 480 annually. We wished to examine whether higher volumes were associated with improved interpretation.
- METHODS:** Data was obtained from seven provincial screening programs on screens performed between 1998 and 2000. Data was abstracted on the age and screen sequence for each screen. Reading volumes for each radiologist was based upon the number reported for the 3-year period. Cancer detection rate (CDR), abnormal call rate (ACR), and positive predictive value (PPV) were calculated for each radiologist. Data was modeled using multivariate hierarchical analysis with a Poisson outcome.
- RESULTS:** Data were analysed on 1.4 million mammograms interpreted by 301 radiologists. Annual reading volumes were categorized into the following categories: 480–699; 700–999; 1,000–1,499; 1,500–1,999; 2,000–2,999; 3,000–4,999; and 5,000+. Models were fit including patient age, screen sequence, province, random radiologist effect, and volume interpreted. No relationship was found between radiologist volume and CDR or ACR. PPV increased with screening volumes up to 2,000 screened annually and then stabilized.
- CONCLUSION:** Screening interpretation outcomes were not strongly related to current radiologist screening volumes.