Integration of automated breast density software into clinical practice

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Abstract

Background and purpose:

Breast density is one of the strongest independent risk factors for breast cancer. Patients with increased breast density are further disadvantaged by the fact that cancers are often masked in areas of high density. Hence, the implementation of routine breast density reporting is becoming increasingly widespread. Generally, breast density is quantified by a visual assessment of breast density that is known to be very subjective. In this talk, we look at how we integrated the objective, automated breast density measurement software, Volpara, into our clinical practice and initial findings.

Methods:

The Volpara software operates as a DICOM server, receiving "For Processing" images directly from the x-ray machine (in our case a Siemens Novation). The software outputs a DICOM Secondary Capture Image for display on the technologist and reading workstations. That image contains the volumetric breast density information and a BI-RADS breast density category, and is typically available within two minutes of the last x-ray.

Results:

The integration of Volpara into our clinical workflow was smooth and using the software we processed 1,652 women at our private breast imaging clinic. The results were extremely helpful in informing women of their breast density and what the implications are in terms of follow-up care.

The average breast volume was 721 cm^3 and the average volumetric breast density was 10.8%. As determined by Volpara, 14% of our women were categorized as BI-RADS 1, 27% as BI-RADS 2, 36% as BI-RADS 3, and 23% as BI-RADS 4. Typically, you might expect a 10%/40%/40%/10% population spread but, because of our private population, the densities are higher. As expected, density was found to decrease with age. Classifying a BIRADS 3 and 4 as a dense breast, 80% of women at age 40 had dense breasts, which decreased linearly to age 80, where just under 20% of women had dense breasts.

Conclusions:

An automated, objective breast density measure integrated smoothly into our workflow. The real, physical nature of the volumetric results, and the fact that the results were available almost immediately, greatly facilitated communicating breast density results and their significance to patients. The population of women we see is denser than might be expected, but this was explained by our population.