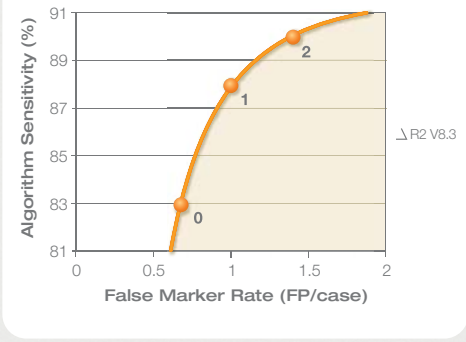
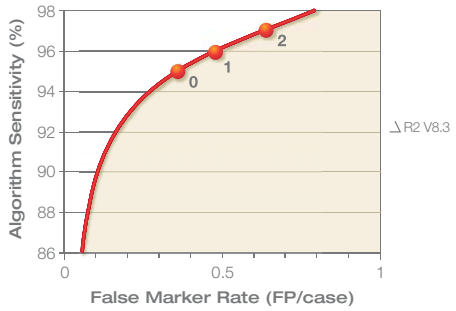
The **Smart Choice** is R2 Digital CAD

HOLOGIC® | R2® Earlier. Smarter. Better.™

Mass Performance



Calc Performance



Unsurpassed **Performance**

Separate Operating Points For Masses and Calcifications

The ImageChecker CAD for digital mammography provides nine operating combinations, allowing the software to be adapted to the radiologists' reading preferences. Three separate operating points (sensitivity/false marker rate settings) can be selected for both microcalcifications and masses; nine combinations in all. For example, a site can choose to set the highest sensitivity for microcalcifications (2) while selecting a balanced operating point (1) for masses, resulting in a lower overall false marker rate. The latest software offers the ability to select separate operating points, between the system's highest sensitivity and lowest false marker rates, for microcalcifications and masses.

The operating points chosen determine the specificity which ranges from 24% of normal cases with no marks at the most sensitive operating point to 48% of normal cases with no marks at the operating point of highest specificity. After all, the best mark is no mark at all.

Review of V8.3 CAD marks on the Hologic SecurView$_{DX}$ workstation.

R2 ImageChecker CAD for **Digital Mammography**

R2 ImageChecker® computer aided detection (CAD) for digital mammography features the most intelligent R2 CAD algorithm to date. Developed to deliver significantly improved detection performance on full-field digital mammography (FFDM) images, it provides the lowest false marker rate at any given sensitivity level.[1]

R2 ImageChecker offers the highest levels of precision and workflow efficiency for your digital environment with advanced tools such as pinpointing regions of interest and increased flexibility for radiologists reading preferences. CAD marks can be easily toggled on and off with the press of a button on the digital mammography workstation. And, with a range of software options already available for the next generation of workstations, this software is ready for the future.

Digital CAD V8.3 **Supports**

- Hologic Selenia
- GE Senographe 2000D
- GE Senographe DS
- GE Senographe Essential
- Siemens MAMMOMAT Novation^{DR}

Sophisticated CAD Solutions for Advanced Reading Environments

RightOn™ High Precision CAD Marks

RightOn CAD marks are designed to pinpoint regions of interest, efficiently drawing the radiologist's eye to important image features. Calcification clusters are marked with the familiar R2 triangle and masses with the R2 asterisk. New is the R2 Malc™ mark that flags regions containing prominent features of both mass and calcifications.

R2 Triangle R2 Asterisk R2 Malc

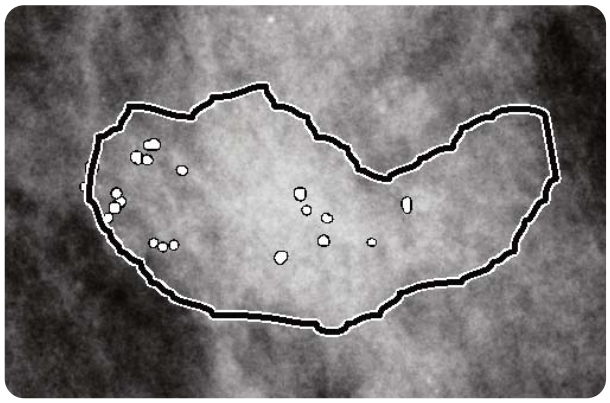
EmphaSize™ Variable Size CAD Marks

EmphaSize[2] marks are displayed in variable sizes correlating to the prominence of a mass or calcification features. When the algorithm determines that a region contains more prominent features, the CAD mark appears larger.

Our intelligent algorithm evaluates each region of interest by examining several key characteristics including signal intensity, number of calcifications in a cluster, and shape of the calcifications. For masses, the algorithm evaluates key characteristics such as degree of spiculation, lesion shape, contrast to surrounding tissue, texture of lesion interior, and edge texture. As more of these features are found, the algorithm enlarges the size of the mark. If a region contains both a mass and calcifications, ImageChecker CAD produces a Malc mark and scales the mark depending upon the prominence of both mass and calcification features.

Emphasize marks are scaled depending upon the prominence of both mass and calcification features

PeerView Digital



PeerView Digital Malc Mark outlines a mass and highlights the individual microcalcifications

PeerView™ Digital CAD Marks

PeerView Digital is an exclusive innovation designed to help the radiologist understand why the ImageChecker CAD algorithm marked a particular region. PeerView Digital enhances the suspicious region to help the radiologist visualize and analyze the specific features that may warrant closer review. PeerView Digital outlines the central density of a detected mass or distortion so the radiologist can evaluate the margin, shape and interior characteristics. Detected microcalcifications are highlighted so the radiologist can determine the number, shape and distribution.

1 Based upon publicly available information, 2007.
2 R2 recommends use of an EmphaSize conformant advanced mammography workstation. See www.r2tech.com/workstations for more information.
3 Tommy E. Cupples, Cunningham JE, Reynolds JC. “Impact of CAD in a Regional Screening Mammography Program.” AJR 2005; 185:944-950

Gold Standard **CAD* Performance**

	Calcification Operating Points			Mass Operating Points		
	0	1	2	0	1	2
Sensitivity[1]	95%	96%	97%	83%	88%	90%
False Marks[2]/Case	0.36	0.48	0.64	0.68	1.0	1.4
			Default		**Default**	

	Operating Point		
Mass/Calc	**0**	**1**	**2**
Case specificity[3]	**48%**	**35%**	**24%**

1. Data based on 1355 biopsy proven breast cancers (767 mass and 588 calcification cases)
2. Data based on 445 four-view normal cases
3. Four-film normal cases with no markers

* Digital mammography algorithm performance is comparable to that of film screen

Extensive Clinical Validation of R2 CAD

R2 CAD is the only mammography CAD system that has been clinically validated via prospective studies to significantly improve detection performance without a significant increase in workup rates. Improvement in radiologist performance using R2 CAD was demonstrated via a prospective clinical trial and first published in 2000 (Freer et al.). Since then, four independent, prospective peer-reviewed clinical studies from academic and community practices have shown that the use of ImageChecker CAD resulted in the detection of 6.64 percent to 19.5 percent more cancers.

More than 30 additional peer-reviewed papers and abstracts further validate the performance of R2 ImageChecker mammography CAD, with the first peer-reviewed paper on commercial CAD published in 1998 (Burhenne et al.). Evidence of the R2 CAD performance advantage continues to mount. For example, according to a prospective study published in the October 2005 issue of the American Journal of Roentgenology (AJR), the detection rates for small, invasive breast cancers (1.0 cm or less) increased by 164% when radiologists used R2's computer aided detection (CAD) to assist in reading mammograms (Cupples et al.[3]). Further, the mean age at screening detection of cancer with R2 CAD was 5.3 years younger than in those cases where CAD was not used.

Continually Improving our CAD Algorithm

Our newest algorithm contains a range of software options including Breast Geometry and Lesion Metrics, ready for the next generation of workstations. Hologic is careful to make sure that your R2 CAD reading environment is consistent regardless of where you read. We continue to improve our hardware software and service offerings so our customers have the best CAD solutions available today. A current list of advanced workstations that conform to R2 CAD Marking Specification is available at **http://www.r2tech.com/workstations.**

Breast Geometry

- Detects breast outline for advanced sizing logic

Lesion Metrics

- Creates advanced measures such as size, number of calcifications and distance to nipple

The power of Hologic is the power of clear innovation and a singular focus…to challenge the boundaries of science and technology every day. Our passion has led to discoveries that contribute to earlier detection, more accurate diagnoses, and better overall patient care. As we focus on the future, we are bound by our clarity of vision. A vision created solely to enhance yours.

Breast Cancer Detection
Breast Biopsy Solutions
Osteoporosis Assessment

HOLOGIC® | R2 Earlier. Smarter. Better.™

Corporate Headquarters
35 Crosby Drive,
Bedford, MA 01730-1401 USA
Tel: +1.781.999.7300
Sales: +1.781.999.7453
Fax: +1.781.280.0668
www.hologic.com

Europe
Everest (Cross Point)
Leuvensesteenweg 250A
1800 Vilvoorde, Belgium
Tel: +32.2.711.4680
Fax: +32.2.725.2087

Asia Pacific
3/F, 21 Li Yuen Street West
Central, Hong Kong
Tel: +852.3102.9200
Fax: +1.781.280.0668